



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





Dedicated to Hazrat Muhammad (S.A.W)



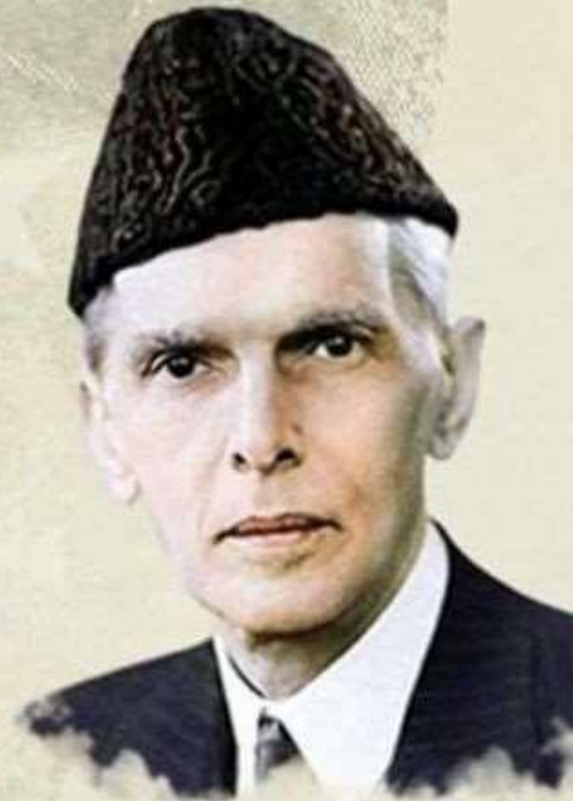
2nd Year MBBS
Clinically Oriented Integrated Modular
Curriculum 2024

Revised September 2024

Quote by Quaid-e-Azam Muhammad Ali Jinnah

“EDUCATION IS A MATTER OF LIFE AND DEATH TO OUR NATION. THE WORLD IS MOVING SO FAST THAT IF YOU DO NOT EDUCATE YOURSELVES YOU WILL BE NOT ONLY COMPLETELY LEFT BEHIND, BUT WILL BE FINISHED UP.”

– 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 critical in 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 Medical 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 tools to 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 future doctors to confront global health challenges, including emerging disease trends, healthcare equity, and solutions for underserved communities.



Prof. Dr. Muhammad Umar
Vice Chancellor RMU



Prof Jahangir Sarwar Khan
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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 and arrangement 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 advance of 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 you an 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 now being 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 Saeed
Professor of Anatomy
Director DME



Prof, Dr. Ayesha Yousaf
Dean 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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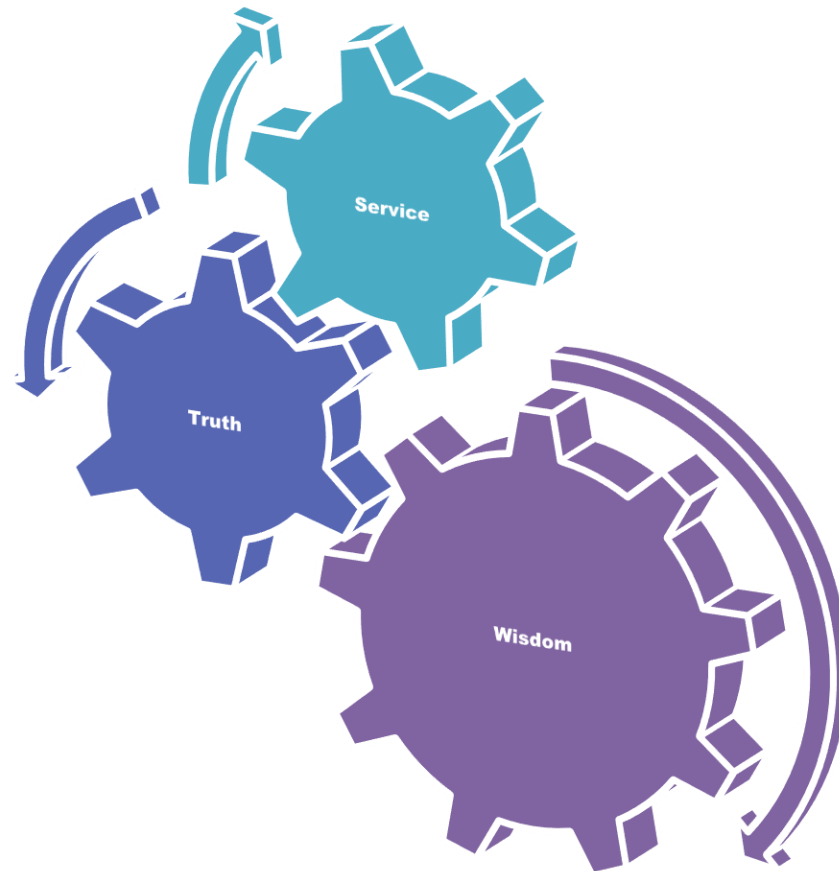
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University Moto, Vision, Values & Goals

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
Dr Samia Sarwar, Dr Ifra Saeed, Dr Ayesha Yousaf, Dr Tehmina Qamar, Dr Sidra Hamid	2023-2024	5 th	Developed for First & Second MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum revamped Bioethics, Family Medicine curriculum incorporated along with Professionalism. Entrepreneurship curriculum incorporated



Table of Contents

Table of Contents

SECTION-I (Contributors & Developing Team)	18
Members of Syndicate	19
Deans of Faculties & Professors	20
Contributors	21
SECTION-II (Preamble)	25
What is Curriculum?	26
What is a Integrated Medical Curriculum?	27
SECTION-III (RMU Undergraduate Competency Framework)	40
RMU Undergraduate Competency Model	41
SECTION-IV (Structured Framework of Clinically Oriented Integrated Modular Curriculum)	50
First to Final year MBBS Framework	51
First Year Academic Calendar 2024	52
Contact Hours First Year MBBS	53
Second Year Academic Calendar 2024	54
Contact Hours Second Year MBBS	55
SECTION-VI (Teaching & Learning Methodologies / Strategies)	67
Prof. Umar's Model Integrated Lecture	68
Small Group Discussion (SGD)	69
Seld Directed Learning (SDL)	70
Case Based Learning (CBL)	70
SECTION-VII (First Year MBBS)	71
Block-I (Foundation + MSK-I Module)	72
Module I - Foundation Module	73
Module II–MSK-I Module	131

Block-II (MSK-II + Blood & Immunity Module).....	175
Module III – MSK-II Module	176
Module IV- Blood and Immunity Module.....	222
Block-III (CVS + Respiratory Module).....	269
Module V – CVS Module	270
Module VI – Respiratory Module	329
SECTION-VIII (Second Year MBBS)	376
Block-IV (GIT + Renal Module)	377
Module I – GIT Module.....	378
Module II – Renal Module.....	434
Block-V (Reproduction + CNS Module).....	472
Module III – Reproduction Module.....	473
Module IV – CNS Module.....	518
Block-VI (Special Senses + Endocrinology Module).....	587
Module V – Special Senses Module.....	588
Module VI – Endocrinology Module.....	634
SECTION-V (Spirally Integrated Courses/ General Education (GEC) Courses)	56
Introduction	57
Alignment of RMU Spiral Courses as per HEC Undergraduate Policy 2023 & Guidelines of PMDC 2024	59
SECTION-IX	679
Learning Resources.....	680
SECTION-X (Assessment Policies)	683
Formative Assessment.....	684
Summative Assessment.....	634
Internal Assessment	687

Table of Specification (TOS) for Module Examination for First & Second Year MBBS.....688

SECTION-XI (Feedback and Evaluation)699

Internal Feedback.....700

Formal Feedback.....700



SECTION-I

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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

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?
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What is a Integrated Medical Curriculum?

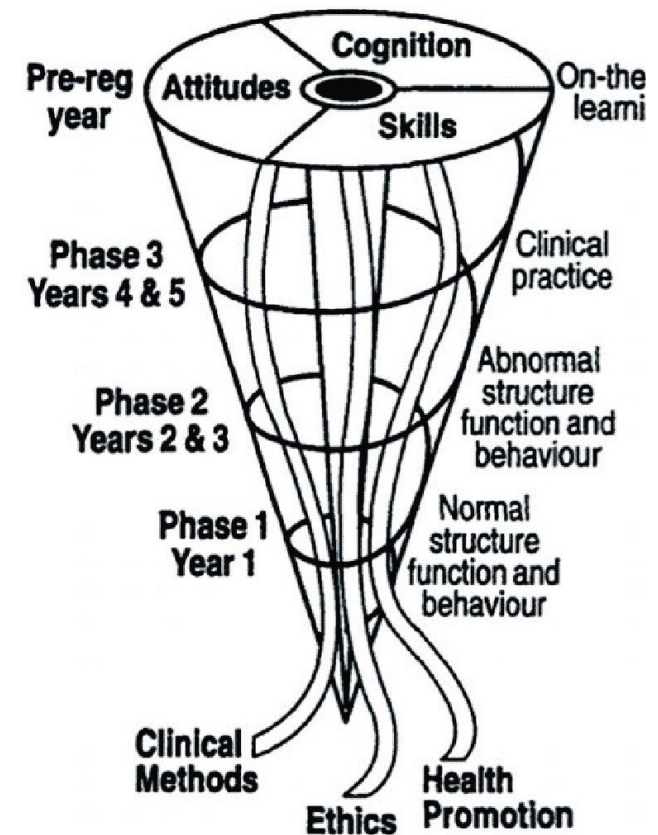
Shoemaker defines an integrated curriculum as “education that is organized in such a way that it cuts across subject matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study.”

There is an ongoing discussion about whether 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.

Integration is therefore of key importance for medical education because basic science learning is placed in the context of clinical and professional practice and is considered by students to be more meaningful 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



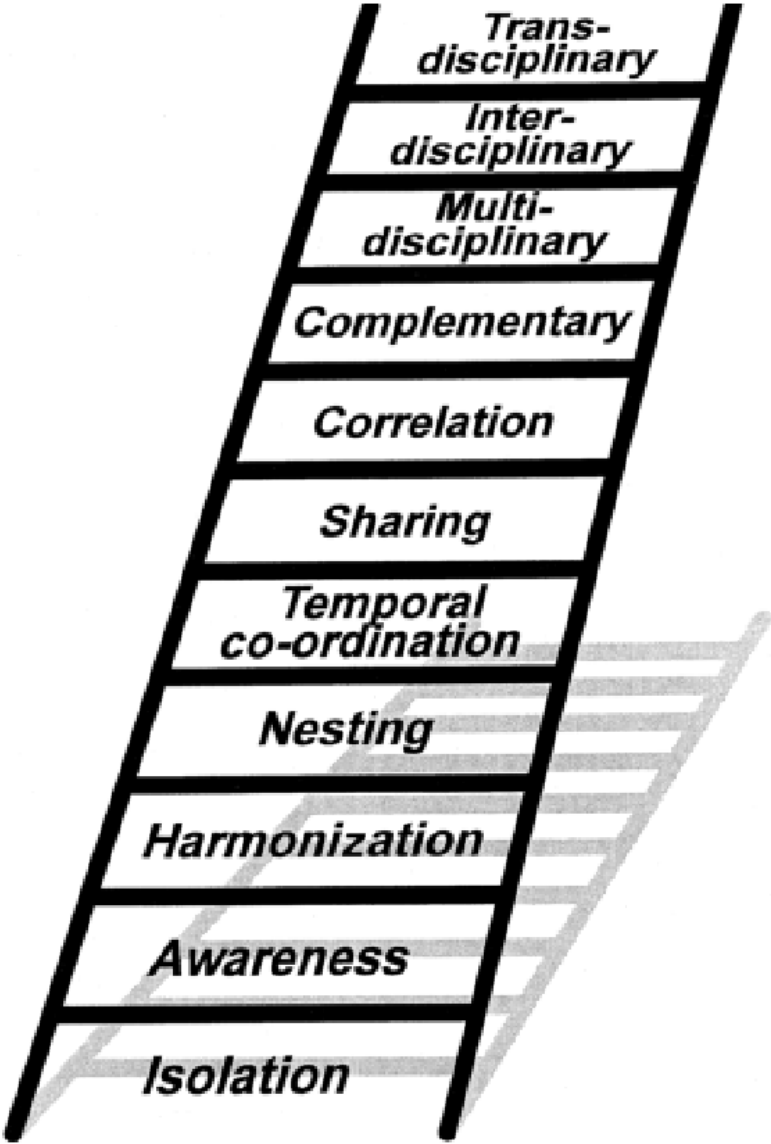
A Spiral Curriculum

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

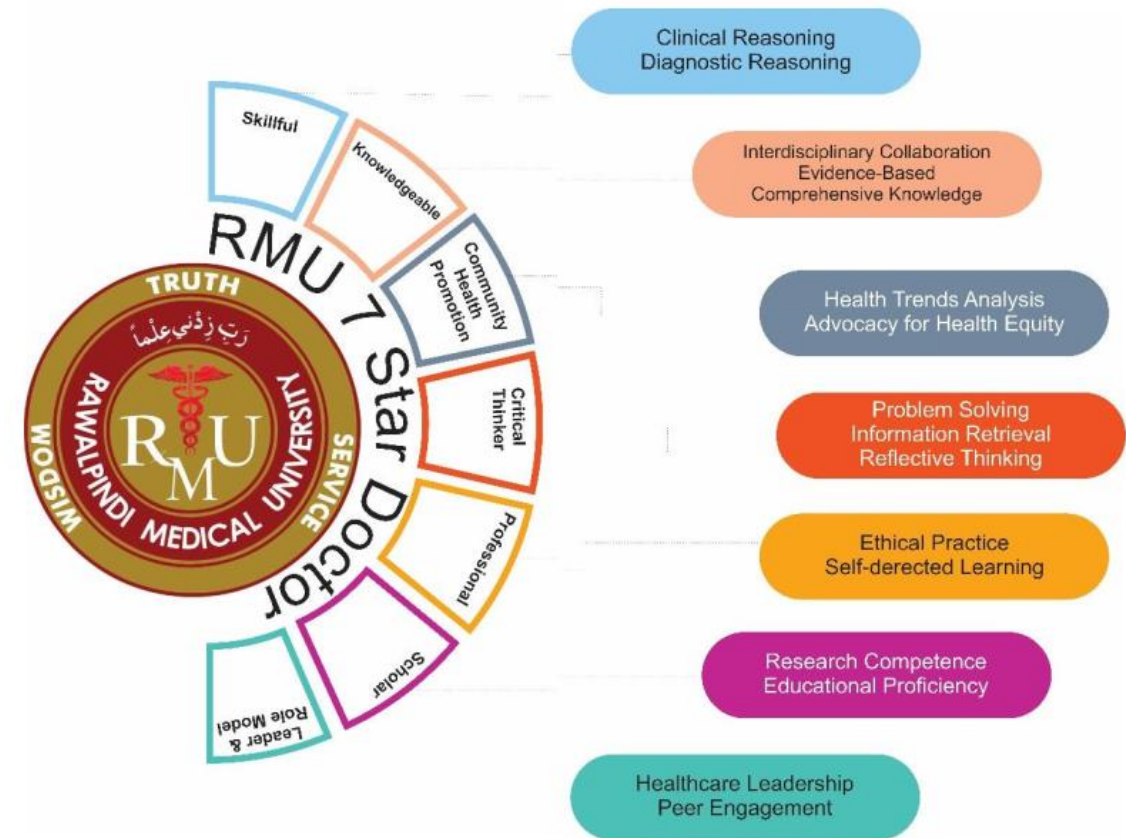
At RMU we aim to produce seven-star doctor according to PMDC Competencies having the generic competencies of “Skill, Knowledge, Community Health Promoter, Critical Thinker, Professional, Scholar, Leader and Role Model”, Rawalpindi Medical University has introduced modular integrated undergraduate curriculum 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.

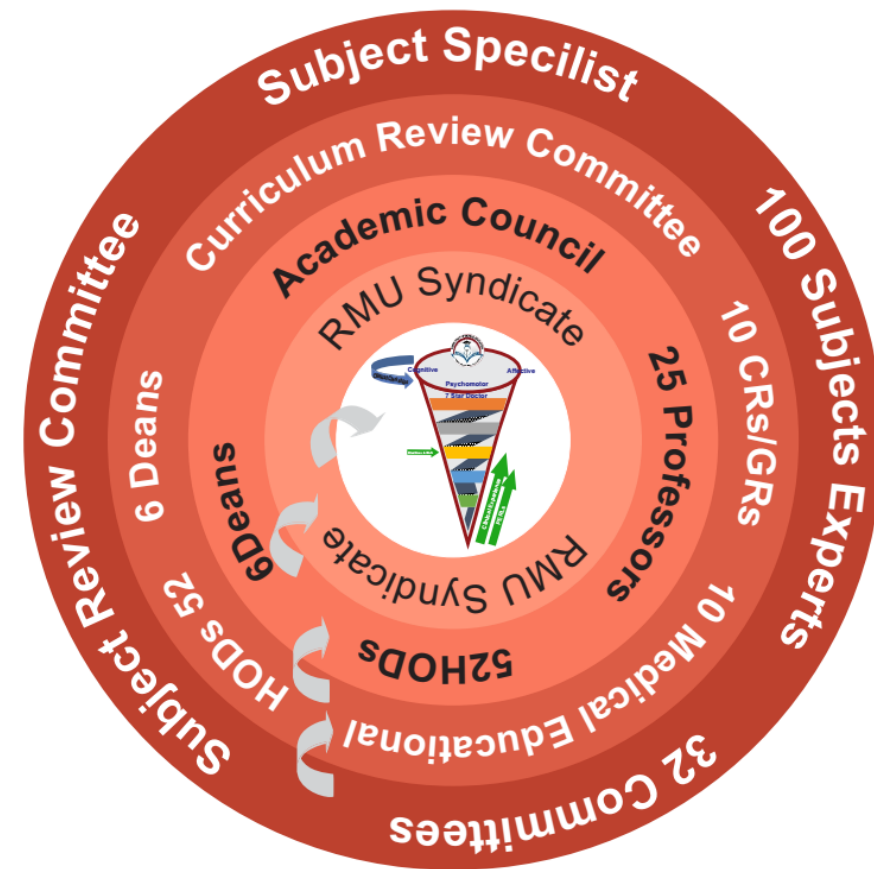
Key perspectives for the context of change include:

- 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.
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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:

- 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.
- 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.
- 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.



Process of Curriculum Development at RMU

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

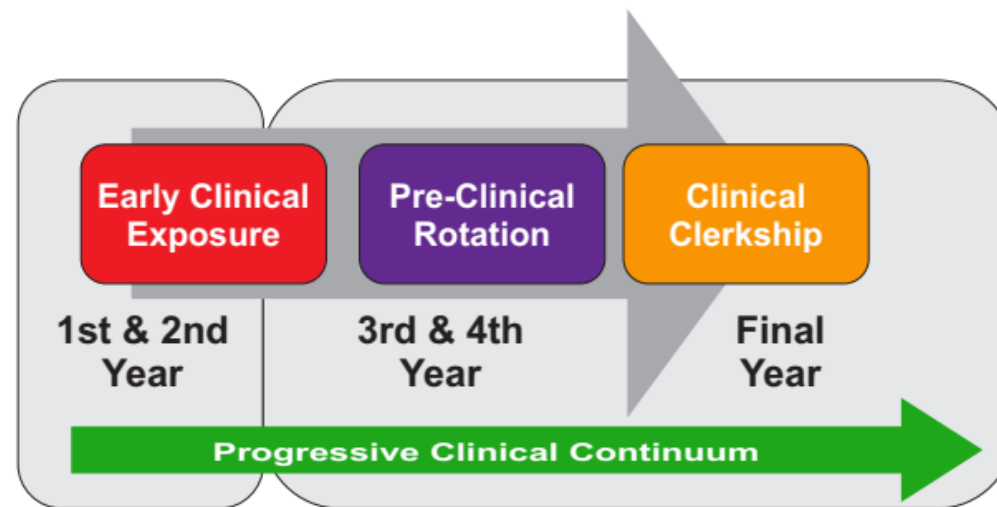
In essence, the curriculum development at Rawalpindi Medical University was a detailed, step-by-step process involving extensive expert input, iterative refinement, and a focus on adaptability and modern educational practices

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.



Integrated Curriculum Design

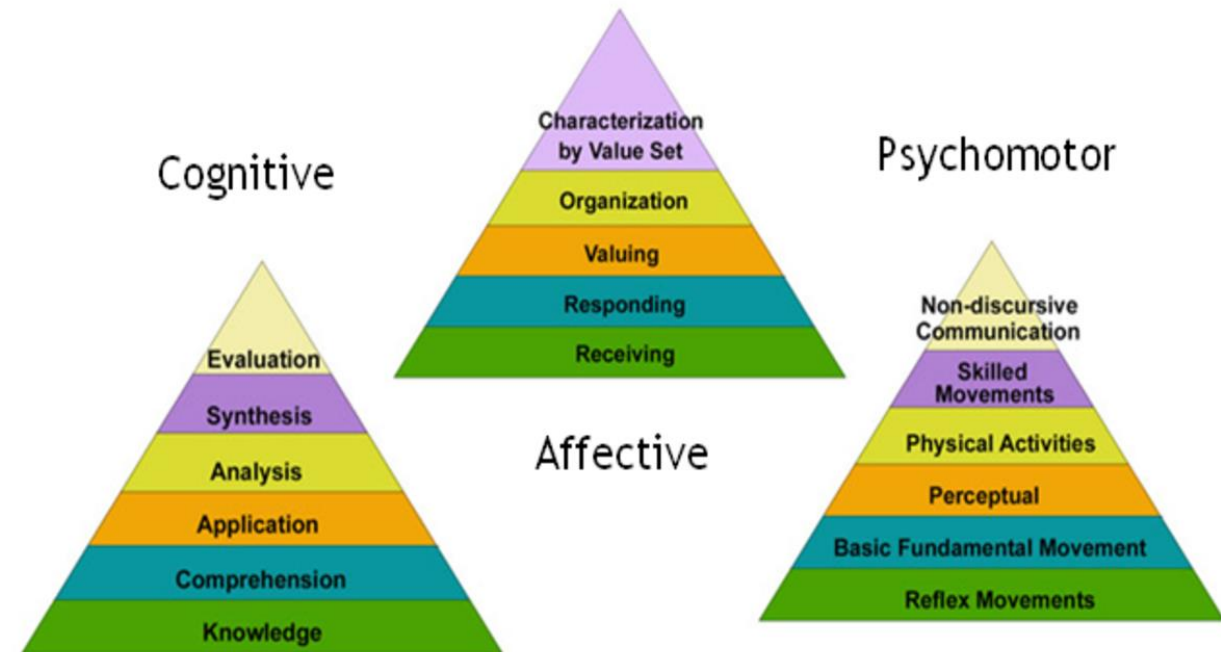
The Module: Module is the smallest unit of Curriculum both in the System- Based and Subject-Base (topic-based) Curricula. Modules are taught as a continuous block or as a longitudinal theme and assessments is carried out at the end of each module. The System-Based Curriculum made up of —Modules, where 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.

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.



Integrated Curriculum Design

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
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SECTION-III

RMU Undergraduate Competency Framework

- **RMU Undergraduate Competency Model**
 - **Outcomes of the Undergraduate Integrated Modular Curriculum**
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The focus of this curriculum is on the roles of a general physician, as identified by the PMDC. These roles include being skillful, knowledgeable, a community health promoter, a critical thinker, a professional and role model, a researcher, and a leader. The competencies emphasized in the first and second years align with these roles.



RMU 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.
 - Apply evidence-based medicine in clinical practice.
 - Reflect on clinical experiences to improve patient care.
 - 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.
 - Demonstrate a commitment to patient-centered care.
 - Engage in community service activities.
 - Reflect on the role of service in medical practice.
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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.
 - 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.
 - 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.
 - 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.
 - 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.
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- Take responsibility for clinical decisions.
 - 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.
 - Demonstrate respect in patient interactions.
 - Collaborate respectfully with team members.
 - 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.
 - Explain the principles of living systems.
 - Apply knowledge of living systems to clinical practice.
 - 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.
 - Analyze the impact of behavior on health outcomes.
 - Apply behavioral principles in patient care.
 - 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.
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- 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.
 - Conduct research on medical topics.
 - 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.
 - 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.
 - Analyze clinical scenarios critically.
 - 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.
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- Communicate medical information clearly.
 - 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.
 - Collaborate effectively with team members.
 - 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.
 - 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.
 - 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.
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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.
 - 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.
 - Conduct community health assessments.
 - Engage with community stakeholders.
 - 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.
 - Adapt health interventions to cultural contexts.
 - 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.
 - Advocate for community health initiatives.
 - Empower individuals to make informed health decisions.
 - Promote policies that address social determinants of health.
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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.
 - Identify potential safety risks in clinical practice.
 - 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.
 - Understand and apply healthcare regulations.
 - Ensure compliance with legal and regulatory standards.
 - 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.
 - Collaborate with interdisciplinary teams in patient care.
 - Contribute to interdisciplinary case discussions.
 - 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.
 - Use AI-based tools for diagnosis.
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- Evaluate the effectiveness of technology in clinical decision-making.
 - 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.
 - Identify ethical issues in AI usage.
 - Apply ethical principles to AI-based decisions.
 - 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

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.
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SECTION-V

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 .

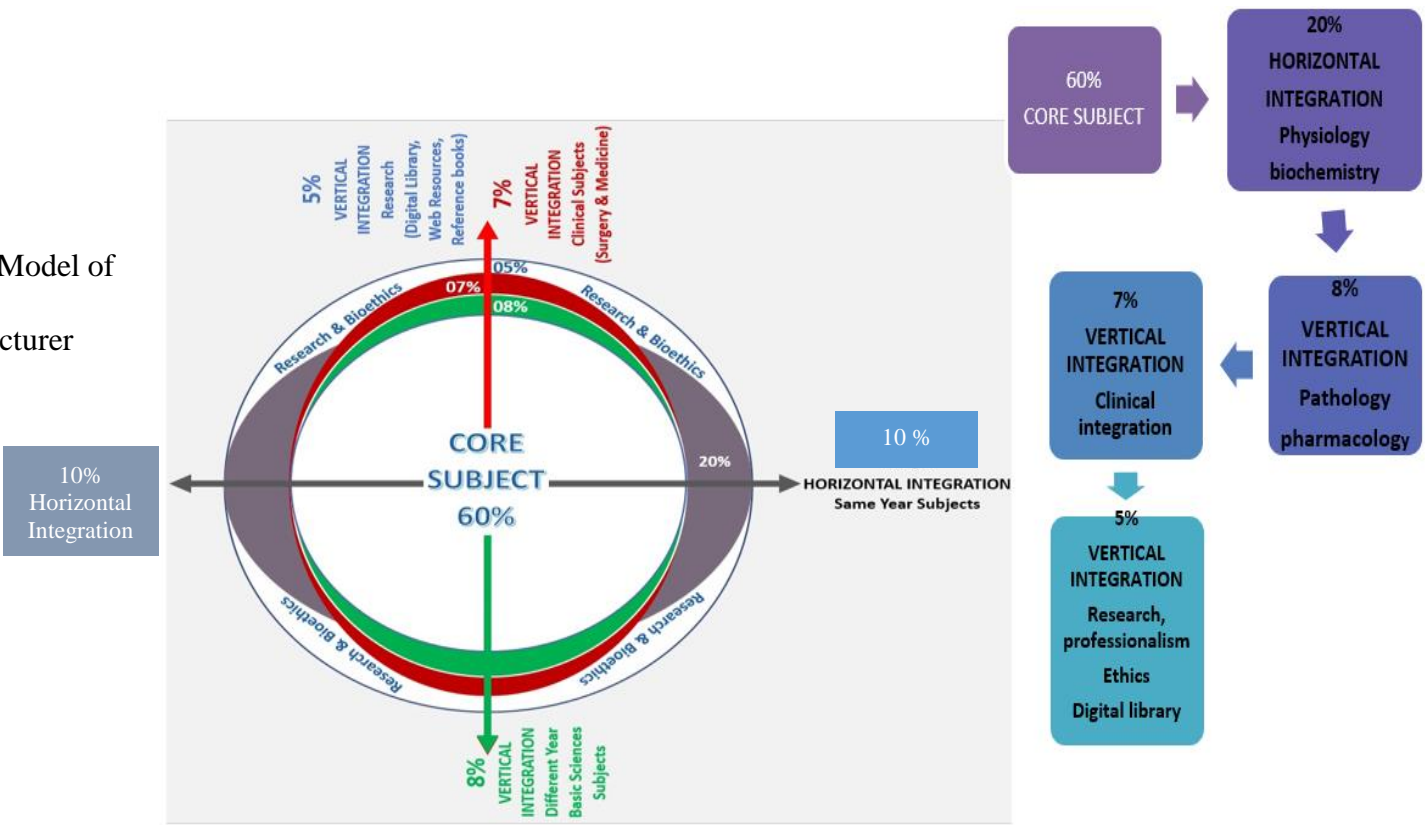
In addition to LGIS, Small Group Discussions (SGD) play a crucial role in deepening students' understanding. These sessions involve structured exercises, such as patient case discussions or topic presentations, designed to promote peer-to-peer learning and critical thinking. The facilitator's role is 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 be 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.



Prof Umar's Model of Integrated Lecture

Small Group Discussion (SGD)

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

Table 2. Standardization of teaching content in Small Group Discussions

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

Table 3. Steps of 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- Jump-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	



SECTION-IV

Five Year Structured Framework of Clinically Oriented Integrated Modular Curriculum 2024

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 Clinically Oriented Integrated Modular Curriculum 2024

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

SECTION-IV

Structured Framework of Second Year MBBS Curriculum

- **Introduction**
- **Second Year Academic Calendar 2024**
- **Contact Hour Distribution for Core, Clinical and Spiral Subjects**

Introduction

The second year MBBS teaching framework at Rawalpindi Medical University spans over 32 weeks of instruction, divided into three major blocks. In the first block (Block IV), the curriculum focuses on the gastrointestinal tract (GIT) and renal system modules, with 5 weeks allocated to each. This block comprises 38% of the total teaching hours. Anatomy, Physiology, and Biochemistry continue as core subjects, and the content is integrated with relevant clinical subjects like Community Medicine and Pathology. The GIT module alone receives a significant portion of teaching hours, emphasizing the complex interplay between biochemical digestion processes and anatomical structures like the digestive tract and associated organs.

In Block V, the focus shifts to the reproductive system and the central nervous system (CNS). The reproductive system is taught over 4 weeks, while the CNS module extends to 6 weeks. This block accounts for 31% of the total teaching hours. The core subjects remain horizontally integrated across these modules, with vertical integration provided through clinical applications in fields like Psychiatry, Medicine, and Surgery. The CNS module particularly emphasizes the physiological functions and biochemical aspects of the brain and spinal cord, linking these theoretical concepts with clinical cases in neurology and psychiatry.

The final block (Block VI) in the second year covers special senses and endocrinology, with each module lasting 4 and 5 weeks, respectively. This block contributes 31% of the total teaching hours. Anatomy, Physiology, and Biochemistry are again taught in an integrated manner with clinical disciplines such as Pathology, Medicine, and Pediatrics. In the endocrinology module, students explore the intricate hormonal feedback mechanisms and biochemical processes that regulate body systems, applying this knowledge in clinical settings involving diabetes, thyroid disorders, and other endocrine pathologies.

Overall, the second year builds upon the foundational knowledge from the first year by increasing the complexity of system-based modules and integrating more clinical exposure. Vertical integration through subjects like Pharmacology and Pathology ensures that students understand how basic sciences are applied in diagnosing and treating diseases. Spirally integrated courses such as Behavioral Sciences and Family Medicine continue to reinforce soft skills and holistic patient care, preparing students for more advanced clinical rotations in their third year.

Second Year Academic Calendar 2024

Blocks	Block-I							Block II					Block III				Schedule of Send Up and Professional Examination					
Dates	Duration in Weeks / Days	Module	Renal (04 Weeks)					Reproduction	Summer Vacation	CNS				Special Senses	Module Assessment	Endocrinology	Module Assessment	Block Assessment	Prep leaves for send up	Send up	Prep Leaves for Professional Examination	Professional Examination
			05 Weeks	03 Days	08 Days	First Week	Second Week			06 Days	Third & Fourth Weeks	06 Days	04 Days									
26 th -Feb – 30 th March 2024	05 Weeks	GIT Module																				
01 st April – 03 rd April, 2024	03 Days	Module Assessment																				
05 th April – 13 th April 2024	08 Days	Spring Vacation																				
18 th April – 20 th April 2024	First Week	Renal																				
22 nd April – 27 th April 2024	Second Week	Renal																				
29 th April – 04 th May 2024	06 Days	Student Week																				
06 th May – 16 th May 2024	Third & Fourth Weeks	Renal																				
17 th May – 23 rd May 2024	06 Days	Module Assessment																				
24 th May – 28 th May 2024	04 Days	Block Assessment																				
29 th May – 26 th June 2024	04 Weeks	Reproduction																				
17 th June – 20 th July 2024																						
22 nd July – 27 th July 2024	06 Days	Module Assessments																				
29 th July – 31 st August 2024	05 Weeks	CNS Module																				
02 nd Sep – 07 th Sep 2024	06 Days	Module Assessment																				
09 th Sep – 11 th Sep 2024	03 Days	Block Assessment																				
12 th Sep – 2 nd Oct 2024	03 Weeks	Special Senses																				
03 rd Oct – 10 th Oct 2024	06 Days	Module Assessment																				
11 th Oct – 08 th Nov 2024	04 Weeks	Endocrinology																				
09 th Nov – 15 th Nov 2024	06 Days	Module Assessment																				
16 th Nov – 20 th Nov 2024	04 Days	Block Assessment																				
21 st Nov – 30 th Nov 2024	10 Days	Prep leaves for send up																				
01 st Dec – 13 th Dec 2024	13 Days	Send up																				
14 th Dec 2024 – 01 st Jan 2025	20 Days	Prep Leaves for Professional Examination																				
02 nd Jan 2025 – 25 th Jan 2025	24 Days	Professional Examination																				

*Note: All dates are subject to change.

Contact Hour Distribution for Core Subjects **Second Year MBBS**

Teaching Hours 2 nd Year MBBS							
Blocks	Modules	Anatomy	Physiology	Biochemistry	Total	Total Hours	Percentage
Block-IV	GIT	103	118	29	250	414	38
	Renal	50	86	28	164		
Block-V	Reproduction	58	74	22	154	339	31
	CNS	45	113	27	185		
Block-VI	Special Senses	74	24	55	153	333	31
	Endocrinology	74	30	76	180		
Total Hours Per Subject		404	445	237	1086		
Percentage		38	37	41	22		100

Discipline Wise Clinical Teaching Hours **for Second Year MBBS**

Sr. No	Discipline	Contact Hours
1.	Psychiatry	1
2.	Community Medicine	10
3.	Medicine	15
4.	Bioethics	9
5.	Surgery	17
6.	Pathology	10
7.	Pharmacology	3
8.	Radiology	7
9.	Pediatrics	5
10.	Family Medicine	4
11.	Quran Translation	11
12.	Islamiyat	12
13.	Pak Studies	10
14.	Research Club activity	5
15.	Eye	4
16.	ENT	3
17.	Behavioral Sciences	3
18.	Gynae/Obstetrics	4
Total Hours		103 Hours



SECTION-VI

BLOCK-IV

- **Module VII - Gastrointestinal Module**
- **Module VIII - Renal Module**

Block-I

Module No. 1 – Gastrointestinal Tract

Duration 6 Weeks

GIT Module Team

Module Name : GIT Module
 Duration of module : 06 Weeks
 Coordinator : Dr. Uzma Kiyani
 Co-coordinator : Dr. Minahil Haq
 Reviewed by : Module Committee

Module Committee		Module Task Force Team	
Vice Chancellor RMU	Prof. Dr. Muhammad Umar	Coordinator	Dr. Uzma Kiyani (Senior Demonstrator of Physiology)
Director DME	Prof. Dr. Rai Muhammad Asghar	DME Focal Person	Dr. Sidra Hamid (DHPE)
Convener Curriculum	Prof. Dr. Naeem Akhter	Co-coordinator	Dr. Shazia Nosheen (Senior Demonstrator of Physiology)
Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf	Co-Coordinator	Dr. Minahil Haq (Senior Demonstrator of Anatomy)
Additional Director DME	Prof. Dr. Ifra Saeed	Co-coordinator	Dr. Uzma Zafar (APWMO of Biochemistry)
Chairperson Physiology	Prof. Dr. Samia Sarwar	DME Implementation Team	
Chairperson Biochemistry	Dr. Aneela Jamil		
Focal Person Anatomy Second Year MBBS	Dr. Maria Tasleem	Director DME	Prof. Dr. Rai Muhammad Asghar
Focal Person Physiology	Dr. Sidra Hamid	Implementation Incharge 1st & 2 nd Year MBBS & Add. Director DME	Prof. Dr. Ifra Saeed
Focal Person Biochemistry	Dr. Aneela Jamil	Module planner & Implementation Coordinator	Dr. Sidra Hamid
Focal Person Pharmacology	Dr. Zunera Hakim	Editor	Muhammad Arslan Aslam
Focal Person Pathology	Dr. Asiya Niazi		
Focal Person Behavioral Sciences	Dr. Saadia Yasir		
Focal Person Community Medicine	Dr. Afifa kalsoom		
Focal Person Quran Translation Lectures	Dr. Uzma Zafar		
Focal Person Family Medicine	Dr. Sadia Khan		

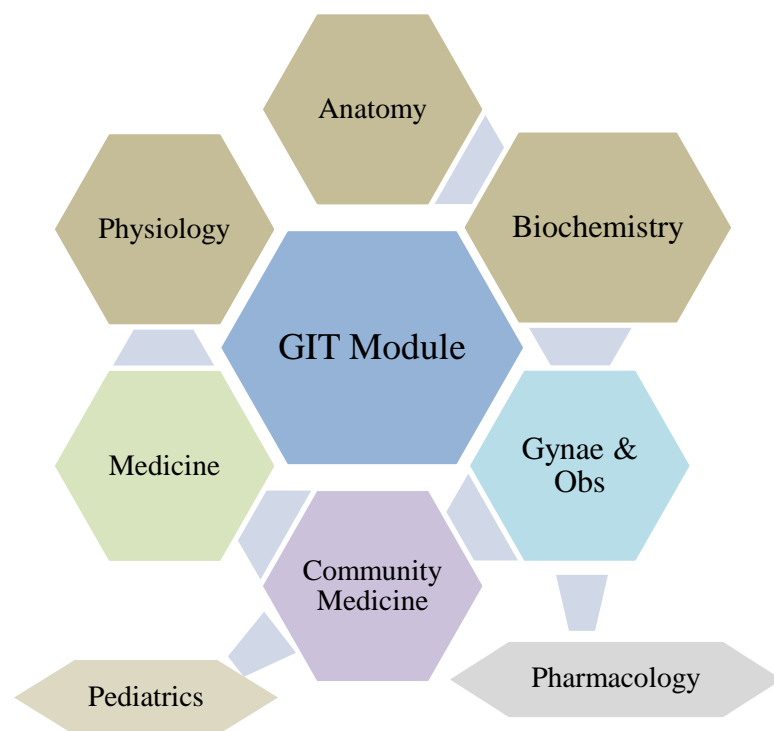
Integration					
Themes					
Block	Module	General Anatomy	Embryology	Histology	Gross Anatomy
1	Anatomy	-	Tongue, Body Cavities, Gastrointestinal System	Digestive Tract & associated organs (Junqueira)	Oral Cavity, Abdomen and associated visceras
	Biochemistry	Carbohydrate metabolism, GIT digestive juices, Digestion and absorption, GIT Hormones LFTs, Jundice & Nutrition,			
	Physiology	General Principles of Gastrointestinal Function—Motility, Nervous Control, and Blood Circulation Propulsion and Mixing of Food in the Alimentary Tract Secretory Functions of the Alimentary Tract, Digestion and Absorption in the Gastrointestinal Tract Physiology of Gastrointestinal Disorders			
	Orientation Session				
	Department of Medical Education (DME)	<ul style="list-style-type: none">• Orientation Session on Curricular Reform RMU & Feedback of Year 2023• Student Session on Standardization of Teaching Strategies			
	Spiral Courses				
	The Holy Quran Translation	The Holy Quran Translation Component <ul style="list-style-type: none">• Imaniat I• Ibadat I• Ibadaat-II• Imaniyaat-II• Ibadaat-III• Imaniat-III			
	Pak Studies/Islamiyat	<ul style="list-style-type: none">• Tehreek-E-Pakistan Islaahi Tehreekain• Akhirat-I• Toheed• Qayam e Pakistan, Aghraaz o Maqasid• Tehreek-e-Aligarh, Sir Syed Ahmad Khan• Akhirat -II			
	Bioethics & Professionalism	<ul style="list-style-type: none">• Pakistan Medical & dental council Code of Ethics			
	Research (IUGRC)	<ul style="list-style-type: none">• Introduction to descriptive statistics (Research-I)• Classification of different types of Data (Research-II)			

		<ul style="list-style-type: none">• Scales of Data measurement (Research-III)• Measures of central Tendency (Research-IV)• Compute & Interpret measures of central tendency (Research-V)• Measure of dispersion/ Secondary data Analysis (Research-VI)
	Radiology & Artificial Intelligence	<ul style="list-style-type: none">• Medical imaging of abdomen- I• Medical imaging of abdomen-II
	Family Medicine	<ul style="list-style-type: none">• Common Abdominal diseases
	Behavioral Sciences	<ul style="list-style-type: none">• Eating Disorders
	Vertical Integration	
	Clinically content relevant to GIT module <ul style="list-style-type: none">• Concept of health & disease (Community medicine)• Epidemiology of infectious diseases & Basic Concepts (Community medicine)• Peptic ulcer (Medicine)• Jaundice (Medicine)• Irritable Bowel Syndrome (Medicine)• Antidiarrheal drugs & drugs for Peptic Ulcer Disease (Pharmacology)• Acute & Chronic Diarrhea (Pediatrics)• Common GIT problems in pregnancy (Hyperemesis gravidarum, GERD, Constipation, hemorrhoids) (Gynae and OBS)	
	Clinical Relevance	
	<ul style="list-style-type: none">• Clinical Presentation and Management of Peptic Ulcer Disease• Mechanisms of Malabsorption Syndromes (e.g., celiac disease)• Diagnosis and Management of Gastroesophageal Reflux Disease (GERD)• Pathophysiology of Inflammatory Bowel Diseases (e.g., Crohn’s disease, ulcerative colitis)• Clinical Features of Appendicitis and Surgical Decision-Making• Gastrointestinal Bleeding: Causes and Initial Management• Jaundice: Differentiation and Clinical Evaluation• Liver Cirrhosis and its Complications (e.g., ascites, hepatic encephalopathy)• Gallstones: Pathogenesis and Surgical Indications• Mechanisms of Diarrhea and Dehydration Management	

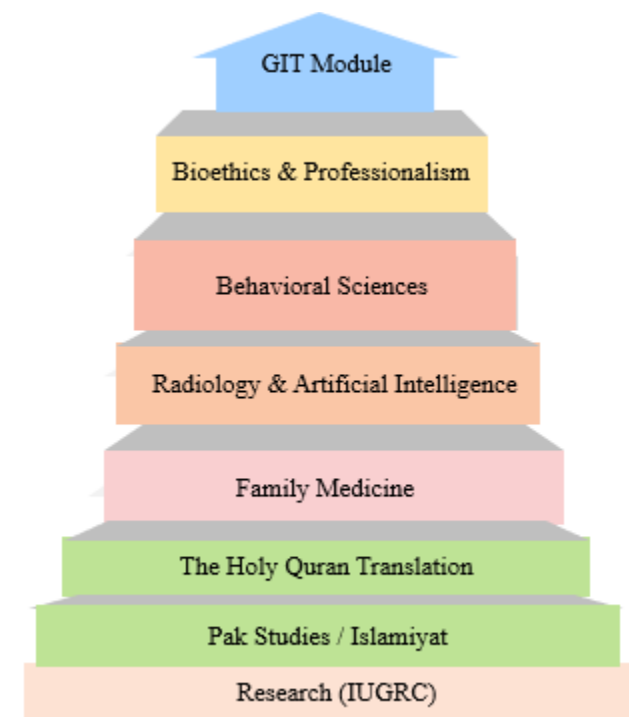
Implementation of Terms of Reference (TORS)

- 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 GIT Module



Spiral /General Education Cluster Courses



Module No. 1 - GIT

Rationale: GIT module has been designed to unravel the basic structure function of the alimentary system along with its embryological development and anomalies. The composition of the food is complex and little of it is water soluble. Therefore, it cannot enter body fluids. Hence it needs to be broken down into its chemical components before it can be absorbed. Four activities of the GIT tract can be identified for this process to occur. These are:

Motility: The term is used to describe the movements of the GIT tract. These movements are responsible for breaking down and pushing the food along the alimentary tract and to its destination as feces.

Secretion: Different secretion of the GIT are concerned with breakdown of food into its digestive particles

Digestion: Break down of food into small pieces. It is produced by the mechanical activity of the alimentary tract. The surface of the food is exposed to enzymatic activity.

Absorption: The transfer of nutrients or the digestive products from the lumen to blood or the lymph.

Disruption of any of its activities can lead to disease states such as pain, peptic ulceration, diarrhea & constipation.

Coordination of all these functions is brought about hormones of GIT and exocrine pancreas.

Module Outcomes

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

Knowledge

- Explain the structural & developmental organization of GIT.
 - Explain the composition, functions, mechanism & control of following gastrointestinal secretions: salivary, gastric, pancreatic, biliary, small & large intestines.
 - Explain the swallowing and motility patterns in the GIT & its role in mixing, propulsion & evacuation of feces.
 - Describe the mechanism of absorption of various nutrients and their role in malabsorption syndrome.
 - Explain the physiological anatomy, biochemistry functions and dysfunctions of Liver.
 - Explain the formation, function & control of secretion of bile.
 - Explain the GIT hormones (structure, function) & their role in secretion and motility.
 - Apply the knowledge of the basic sciences to understand pathophysiology of common GIT diseases.
 - Appreciate concepts & importance of
 - **Family Medicine**
-

- **Biomedical Ethics**
- **Artificial Intelligence**
- **Research**

Skills

- Dissect various parts of GIT, and related structures including peritoneum, to demonstrate their gross Anatomy and relationship to each other.
- Identify different organs of GIT under microscope and on model.

Attitude

- Demonstrate a **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!



Syllabus of Gastrointestinal Tract (Module No. 1)

Anatomy				
Theory				
Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Embryology				
Embryology Development of Tongue	• Describe the development of pharyngeal apparatus	C2	LGIS	SAQ MCQ VIVA OSPE
	• Enlist the sources for development of different parts of tongue.	C1		
	• Explain the development of tongue along with its nerve supply.	C2		
	• Describe the congenital anomalies associated with tongue	C2		
	• Describe the developmental basis of physiological and biochemical mechanisms involved in perception and transmission of taste sensation	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• Practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use HEC digital library	C3		
Embryology Development of Body cavities I & II	• Enumerate different body cavities	C1	LGIS	SAQ MCQ VIVA OSPE
	• Describe division of embryonic body cavity	C2		
	• Discuss formation and significance of pleuropericardial membranesand pleuroperitoneal membranes	C2		
	• Describe muscular ingrowth from Lateral body walls	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		

	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Embryology Development of Salivary glands	• Explain different stages of development of salivary glands	C2	LGIS	SAQ MCQ VIVA OSPE
	• Enlist the source for development of different type of salivary gland	C1		
	• Explain development of its nerve supply	C2		
	• Describe the congenital anomalies associated with salivary glands	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Embryology Development of Esophagus	• Discuss the formation of tracheoesophageal septum and its importance	C2	LGIS	SAQ MCQ VIVA OSPE
	• Describe salient features of esophageal development	C2		
	• Describe congenital anomalies of esophagus	C2		
	• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of swallowing	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
	• Explain the development of stomach	C2		

Embryology Development of Stomach	• Discuss rotations and positional shifts of stomach & their effect on nerve supply and peritoneal attachments	C2	LGIS	SAQ MCQ VIVA OSPE
	• Explain formation of omental bursa.	C2		
	• Describe congenital anomalies of stomach	C2		
	• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of digestion in the stomach	C2		
	• Discuss pernicious anemia	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Embryology Liver	• Describe formation of hepatic diverticulum	C1	LGIS	SAQ MCQ VIVA OSPE
	• Describe histogenesis of liver during intrauterine life	C1		
	• Describe formation of various ligaments of liver.	C1		
	• Discuss congenital abnormalities of liver	C3		
	• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of detoxification in the liver	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		

Embryology Gall bladder, pancreas and Biliary apparatus	• Discuss development of Gall bladder	C2	LGIS	SAQ MCQ VIVA OSPE
	• Describe /congenital anomalies of gall bladder	C2		
	• Discuss development and congenital anomalies of pancreas	C2		
	• Describe development of extrahepatic biliary apparatus and its parts with abnormalities	C2		
	• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of production of bile and pancreatic vsecretions	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive heath care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Embryology Development of small intestine	• Describe development of mid gut, midgut loop and rotation of midgut loop.	C2	LGIS	SAQ MCQ VIVA OSPE
	• Explain physiological umbilical hernia and return of mid gut to abdomen.	C2		
	• Describe fixation of intestines and transformations in peritoneal dispositions after mid gut loop return.	C2		
	• Describe congenital anomalies and clinical correlation of mid gut development.	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive heath care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
	• Enlist parts of large intestine.	C2		

Embryology Development of large intestine	• Describe partitioning of cloaca and cloacal membrane.	C2	LGIS	SAQ MCQ VIVA OSPE
	• Describe development of anal canal.	C2		
	• Describe congenital anomalies of large intestine.	C3		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Histology				
Histology Tongue	• Discuss surfaces of tongue with their histological features	C1	LGIS	SAQ MCQ VIVA OSPE
	• Describe different papillae of tongue with their location & features	C2		
	• Explain histological features of taste buds	C2		
	• Discuss leukoplakia and oral thrush	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Histology Salivary glands	• Enlist major salivary glands	C2	LGIS	SAQ MCQ VIVA OSPE
	• Explain histological structure of salivary glands	C2		
	• Discuss different cells forming parenchyma of salivary glands	C2		
	• Discuss histology of duct system	C2		
	• Differentiate between major salivary glands on histological basis	C2		

	• Discuss effects of viral infections on salivary glands	C3		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Histology General organization of GIT	• Describe the developmental basis of physiological and biochemical mechanisms involved in perception and transmission of taste sensation	C2	LGIS	SAQ MCQ VIVA OSPE
	• Describe the histological characteristics of each layer with functional significance	C2		
	• Discuss associated clinicals (megacolon, chagas disease)	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Histology Esophagus	• Describe the histological layers of esophagus.	C2	LGIS	SAQ MCQ VIVA OSPE
	• Compare between various portions of esophagus histologically.	C2		
	• Discuss GERD	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		

	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Histology Stomach	• Describe the histological layers of different parts of stomach	C2	LGIS	SAQ MCQ VIVA OSPE
	• Describe histological differences of different parts of the gastric glands	C2		
	• Describe the structure and function of different cells of gastric glands	C2		
	• Explain clinical conditions associated with stomach histologically	C2		
	• Discuss pernicious anemia	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Histology Liver	• Discuss in detail the histological organization of liver	C2	LGIS	SAQ MCQ VIVA OSPE
	• Explain the structure of liver lobule, portal triads& hepatic acinus and its functional importance	C2		
	• Discuss histological features of hepatocytes.	C2		
	• Explain Hepatic cords, central vein, portal triad, hepatic venules, hepatic arterioles, bile duct & liver sinusoids.	C2		
	• Discuss the blood supply of the liver.	C2		
	• Explain different cells of the liver tissue	C2		
	• Describe clinical aspects of liver on histological grounds	C2		
	• Discuss cirrhosis, fatty liver	C2		
	• Discuss jaundice	C2		

	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
	• Correlate with the clinical conditions	C3		
Histology Pancreas & Gall Bladder	• Differentiate between exocrine and endocrine pancreas.	C2	LGIS	SAQ MCQ VIVA OSPE
	• Discuss the cellular structure and function of exocrine pancreatic acinus and ducts.	C2		
	• Discuss acute & chronic pancreatitis and pancreatic cancer	C2		
	• Explain the histological features of the gallbladder.	C2		
	• Discuss cholelithiasis	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures	C3		
	• To practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
Histology Small Intestine	• Differentiate the histological features of duodenum, jejunum and ileum	C2		
	• Discuss the location and function of villi, crypts of Lieberkuhn and	C2		
	• microvilli in different parts of small intestine	C2		
	• Discuss different cells lining the epithelium of small intestine	C2		
	• Discuss histological aspects of celiac disease and Crohn disease	C2		
	• Correlate with the clinical conditions	C3		

	<ul style="list-style-type: none"> • Understand curative and preventive health care measures 	C3		
	<ul style="list-style-type: none"> • To practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles 	C3		
	<ul style="list-style-type: none"> • Use of HEC digital library 	C3		
Histology Large Intestine I (General Histological Features)	<ul style="list-style-type: none"> • Describe histological features of parts of large intestine. 	C2		
	<ul style="list-style-type: none"> • Discuss cells lining the epithelium 	C2		
	<ul style="list-style-type: none"> • Explain concept of tenaei coli. 	C2		
	<ul style="list-style-type: none"> • Differentiate histological structure of the large intestine from the small intestine. 	C2		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures 	C3		
	<ul style="list-style-type: none"> • To practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles 	C3		
	<ul style="list-style-type: none"> • Use of HEC digital library 	C3		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
Histology Large Intestine II (Histological Features of different parts)	<ul style="list-style-type: none"> • Describe histological features of appendix, caecum, rectum and anal canal 			
	<ul style="list-style-type: none"> • Discuss clinical conditions (Colorectal cancer) 			
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures 	C3		
	<ul style="list-style-type: none"> • To practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles 	C3		
	<ul style="list-style-type: none"> • Use of HEC digital library 	C3		

Topic	Learning Objectives Students Should Be Able To	C/P/A	Teaching Strategy	Assessment Tool
Topographical organization of Gastrointestinal tract	<ul style="list-style-type: none"> Enlist components of gastrointestinal tract 	C1	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> Mark the planes dividing the abdomen into nine quadrants 	P		
	<ul style="list-style-type: none"> Enumerate the parts of GIT lying in the various quadrants 	C1		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research articles 	C3		
	<ul style="list-style-type: none"> Use of HEC digital library 	C3		
Oral Cavity, tongue and salivary glands,	<ul style="list-style-type: none"> Define the boundaries of oral cavity 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> Tabulate the Extrinsic and Intrinsic muscles of the tongue, anatomical location and clinical importance of tongue 	C2		
	<ul style="list-style-type: none"> Brief Introduction of salivary glands with their anatomical location 	C1		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research articles 	C3		
	<ul style="list-style-type: none"> Use of HEC digital library 	C3		
Anterolateral abdominal wall	<ul style="list-style-type: none"> Explain the layers of abdominal wall. 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> Explain the fascia and muscles of abdominal wall. 	C2		
	<ul style="list-style-type: none"> Describe nerve supply of anterior and lateral abdominal wall. 	C2		
	<ul style="list-style-type: none"> Explain the segmental sympathetic supplies 	C2		
	<ul style="list-style-type: none"> Abdominal Hernias 	C1		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research articles 	C3		
	<ul style="list-style-type: none"> Use of HEC digital library 	C3		
	<ul style="list-style-type: none"> Describe Formation of rectus sheath 	C2		
	<ul style="list-style-type: none"> Enlist contents of rectus sheath 	C2		
	<ul style="list-style-type: none"> Discuss associated clinical anatomy 	C2		

Rectus sheath,	<ul style="list-style-type: none"> • Correlate with the clinical conditions • Understand curative and preventive health care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library 	C3 C3 C3 C3 C3 C3 C3	Skill lab	SAQ MCQ VIVA OSPE
Inguinal Region & Inguinal Hernias	• Describe Walls of Inguinal Canal	C2	Skill lab	SAQ MCQ VIVA OSPE
	• Explain Deep & Superficial Inguinal Ring	C2		
	• Enumerate Structures passing through the inguinal canal	C1		
	• Enlist Coverings of spermatic cord	C1		
	• Explain Mechanics of the inguinal Canal	C2		
	• Describe boundaries of Hassalbachs triangle	C2		
	• Define hernia	C1		
	<ul style="list-style-type: none"> • Differentiate indirect from direct inguinal hernia • Map outline of inguinal canal on simulated patient /model • Correlate with the clinical conditions • Understand curative and preventive health care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library 	C3 P+A C3 C3 C3 C3 C3		
	• Define Anatomy of Testes and Scrotum	C1		
	• Differentiate between Protective Coverings of Testes & scrotum	C2		
Testes, scrotum	• Enumerate Nerve & blood supply of these Structures	C1	Skill lab	SAQ MCQ VIVA OSPE
	• Discuss the parts of epididymis	C2		
	• Discuss Spermatocoele, Varicocoele, Hematocoele, hydrocoele, Testicular torsion	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use of HEC digital library	C3		
	• Use of HEC digital library	C3		
	• Define peritoneum	C1		

Peritoneum & Peritoneal Cavity	<ul style="list-style-type: none"> • Explain the different folds of peritoneum. 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> • Describe greater and lesser sacs 	C2		
	<ul style="list-style-type: none"> • Enlist the intra and retroperitoneal viscera 	C1		
	<ul style="list-style-type: none"> • Discuss vertical tracings of peritoneum 	C2		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles • Use of HEC digital library 	C3		
Subdivisions of Peritoneal Cavity	<ul style="list-style-type: none"> • Describe arrangement of peritoneum in transverse & Longitudinal section of abdomen 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> • Describe arrangement of peritoneum in transverse section of male pelvis 	C2		
	<ul style="list-style-type: none"> • Explain arrangement of peritoneum in transverse section of female pelvis 	C2		
	<ul style="list-style-type: none"> • Explain the layers, folds, recesses and compartments of peritoneum with their clinical importance 	C2		
	<ul style="list-style-type: none"> • Describe peritonitis 	C2		
	<ul style="list-style-type: none"> • Enumerate the signs and symptoms of peritonitis 	C3		
	<ul style="list-style-type: none"> • Treat peritonitis by antibiotics and peritoneal dialysis 	C3		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles • Use of HEC digital library 	C3		
Esophagus	<ul style="list-style-type: none"> • Discuss gross features of abdominal part of esophagus 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> • Enumerate their peritoneal & visceral relations. 	C1		
	<ul style="list-style-type: none"> • Explain blood supply, lymphatic drainage & nerve supply of esophagus 	C2		
	<ul style="list-style-type: none"> • Discuss Esophageal varices 	C2		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles • Use of HEC digital library 	C3		

Stomach	<ul style="list-style-type: none"> • Explain gross features of stomach. 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> • Discuss blood supply, lymphatic drainage & nerve supply of stomach 	C2		
	<ul style="list-style-type: none"> • Explain peritoneal & visceral relations of stomach 	C2		
	<ul style="list-style-type: none"> • Discuss greater and lesser omentum 	C2		
	<ul style="list-style-type: none"> • Describe formation and boundaries of epiploic foramen 	C2		
	<ul style="list-style-type: none"> • Map outline of stomach on simulated patient /model 	P+A		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 			
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
Small Intestine (Duodenum)	<ul style="list-style-type: none"> • Read relevant research articles 	C3	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> • Use of HEC digital library 	C3		
	<ul style="list-style-type: none"> • Describe the different parts of duodenum with their anatomical differences 	C2		
	<ul style="list-style-type: none"> • Enumerate the relations of different parts of duodenum 	C1		
	<ul style="list-style-type: none"> • Discuss its clinical importance 	C2		
	<ul style="list-style-type: none"> • Map outline of duodenum on simulated patient /model 	P+A		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
Small Intestine (Jejunum and Ileum)	<ul style="list-style-type: none"> • Read relevant research articles 	C3	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> • Use of HEC digital library 	C3		
	<ul style="list-style-type: none"> • Describe jejunum and ileum with their anatomical features 	C2		
	<ul style="list-style-type: none"> • Discuss mesentery and its attachment 	C2		
	<ul style="list-style-type: none"> • Discuss its clinical importance 	C2		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles 	C3		
	<ul style="list-style-type: none"> • Use of HEC digital library 	C3		
	<ul style="list-style-type: none"> • Enlist various parts of large intestine 	C1		
	<ul style="list-style-type: none"> • Demonstrate gross anatomical features of different parts of large intestine 	C2		

Large Intestine & Appendix	• Enlist intra and retroperitoneal parts of large intestine	C1	Skill lab	SAQ MCQ VIVA OSPE
	• Discuss gross features of caecum	C2		
	• Describe gross anatomy of appendix	C2		
	• Enlist different anatomical positions of vermiform appendix.	C1		
	• Mark McBurney's point	P		
	• Demonstrate McBurney's incision	P		
	• Discuss common features, differential diagnosis of acute appendicitis and appendicectomy	C3		
	• Map outline of Transverse and descending colon on simulated patient /model	P+A		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use HEC digital library	C3		
Liver, Portal hypertension, Portosystemic Anastomosis	• Describe the anatomical structure of liver.	C2	Skill lab	SAQ MCQ VIVA OSPE
	• Describe the lobes, surfaces and segments of liver	C2		
	• Describe peritoneal reflections, ligaments and bare area of liver.	C2		
	• Enumerate visceral relations of liver.	C1		
	• Enlist the structures in porta hepatis.	C1		
	• Discuss Sub hepatic abscess & Live Biopsy	C2		
	• Discuss formation, course and parts of portal vein	C2		
	• Enumerate relations and tributaries of portal vein	C1		
	• Define portal hypertension	C1		
	• Describe sites of the portocaval anastomosis and their clinical significance	C2		
	• Explain role of portocaval shunts	C2		
	• Map outline of liver on simulated patient /model	P+A		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethetics	C3		
	• Apply strategic use of A.I in health care	C3		
	• Read relevant research articles	C3		
	• Use HEC digital library	C3		
	• Describe location & size of gall bladder	C2		

Gallbladder and Biliary apparatus	<ul style="list-style-type: none"> Enumerate relations of gallbladder. 	C1	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> Describe clinical conditions related to gallbladder 	C2		
	<ul style="list-style-type: none"> Enlist different components of Extra-hepatic biliary System 	C1		
	<ul style="list-style-type: none"> Discuss the right & left hepatic ducts, common hepatic duct, cystic ducts, bile duct 	C2		
	<ul style="list-style-type: none"> Explain differences between Intra & Extra Hepatic Biliary Systems. 	C2		
	<ul style="list-style-type: none"> Discuss clinicals related with biliary apparatus 	C2		
	<ul style="list-style-type: none"> Discuss accessory hepatic ducts Map outline of gallbladder & Bile duct on simulated patient /model Correlate with the clinical conditions Understand curative and preventive health care measures. Practice the principles of bioethetics Apply strategic use of A.I in health care Read relevant research articles Use HEC digital library 	C2 P+A		
		C3		
		C3		
		C3		
Spleen	<ul style="list-style-type: none"> Discuss anatomical location and features of spleen with its blood supply, and lymphatic drainage 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> Explain Rupture of spleen & its effects 	C2		
	<ul style="list-style-type: none"> Map outline of spleen on simulated patient /model 	P+A		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research articles Use of HEC digital library 	C3		
Pancreas	<ul style="list-style-type: none"> Recall location, shape, dimensions and extent of pancreas 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> Discuss parts, ducts and relations of pancreas 	C2		
	<ul style="list-style-type: none"> Describe arterial supply of pancreas 	C2		
	<ul style="list-style-type: none"> Explain applied aspects of pancreas 	C2		
	<ul style="list-style-type: none"> Map outline of pancreas on simulated patient/ model 	P+A		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethetics Apply strategic use of A.I in health care Read relevant research articles 	C3 C3 C3		

	<ul style="list-style-type: none"> • Use of HEC digital library 			
Vasculature of GIT	<ul style="list-style-type: none"> • Describe the position and the vertebral levels of aorta in the abdomen. 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> • Enlist the main branches of the aorta and its territories. 	C1		
	<ul style="list-style-type: none"> • Explain the applied anatomy of the aorta 	C1		
	<ul style="list-style-type: none"> • Explain origin, course, branches and distribution of celiac trunk 	C2		
	<ul style="list-style-type: none"> • Map outline of abdominal aorta, coeliac trunk, superior & inferior mesenteric artery on simulated patient/ model 	P+A C3		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles 	C3		
	<ul style="list-style-type: none"> • Use of HEC digital library 			
Nerve supply and Lymphatic drainage of GIT	<ul style="list-style-type: none"> • Discuss enteric nervous system with formation of plexuses and its parasympathetic role 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> • Enlist the types of lymph nodes draining the abdomen 	C1		
	<ul style="list-style-type: none"> • Describe lymphatic drainage of GIT with special reference to lymphatic trunks, cisterna chyli & the thoracic duct 	C2		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles 	C3		
	<ul style="list-style-type: none"> • Use of HEC digital library 			
Cross Sectional Anatomy	<ul style="list-style-type: none"> • Identify different viscera located at different levels of vertebral column; T10,T11,T12,L1,L2 	C1	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research articles 	C3		
	<ul style="list-style-type: none"> • Use of HEC digital library 			
Rectum	<ul style="list-style-type: none"> • Discuss the location and extent of rectum 	C2	Skill lab	SCQ MCQ
	<ul style="list-style-type: none"> • Describe the internal and external features of rectum 	C2		
	<ul style="list-style-type: none"> • Discuss peritoneal reflections rectouterine, rectovesical fossae and their clinical significance 	C2		

	<ul style="list-style-type: none"> Enumerate relations of rectum 	C1		VIVA OSPE
	<ul style="list-style-type: none"> Discuss blood supply, nerve supply, venous and lymphatic drainage 	C1		
	<ul style="list-style-type: none"> Describe the basis and features of rectal prolapsed 	C3		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research articles 	C3		
	<ul style="list-style-type: none"> Use of HEC digital library 	C3		
Anal canal	<ul style="list-style-type: none"> Discuss location and extent of anal canal 	C2	Skill lab	SAQ MCQ VIVA OSPE
	<ul style="list-style-type: none"> Describe external and internal features of Anal Canal 	C2		
	<ul style="list-style-type: none"> Discuss features of anal sphincters 	C2		
	<ul style="list-style-type: none"> Tabulate relations of the anal canal with the surrounding structures 	C2		
	<ul style="list-style-type: none"> Describe the Blood supply, venous and lymphatic drainage & innervations of anal canal 	C2		
	<ul style="list-style-type: none"> Discuss anal continence 	C2		
	<ul style="list-style-type: none"> Differentiate between internal and external haemorrhoids 	C3		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethetics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research articles 	C3		
	<ul style="list-style-type: none"> Use of HEC digital library 	C3		
Radiological Anatomy	<ul style="list-style-type: none"> Identify structures on a normal X-ray abdomen 	C2	Skill lab	OSPE
	<ul style="list-style-type: none"> Appreciate Air fluid shadows. 	C2		
	<ul style="list-style-type: none"> Mark anatomical landmarks. 	C2		
	<ul style="list-style-type: none"> Correlate the clinical conditions 	C3		
	<ul style="list-style-type: none"> Understand the preventive and curative health care measures 	C3		
	<ul style="list-style-type: none"> Practice the principles of Bioethics 	C3		
	<ul style="list-style-type: none"> Apply Strategic use of AI in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research articles 	C3		
		C3		
		C3		

Topics of SDL	Learning Objectives Students Should Be Able To	Learning Resources
Antero lateral abdominal wall,	<ul style="list-style-type: none"> Explain the layers of abdominal wall. 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 183,184-216). ❖ https://3d4medical.com/
	<ul style="list-style-type: none"> Explain the fascia and muscles of abdominal wall. 	
	<ul style="list-style-type: none"> Describe nerve supply of anterior and lateral abdominal wall. 	
	<ul style="list-style-type: none"> Explain the segmental sympathetic supplies 	
Rectus sheath	<ul style="list-style-type: none"> Describe Formation of rectus sheath 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 188-201). ❖ https://teachmeanatomy.info/
	<ul style="list-style-type: none"> Enlist contents of rectus sheath 	
Inguinal region & Hernias	<ul style="list-style-type: none"> Describe Walls & detailed anatomy of Inguinal Canal 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 197, 202-203, 212-213). ❖ https://3d4medical.com/
	<ul style="list-style-type: none"> Explain Deep & Superficial Inguinal Ring 	
	<ul style="list-style-type: none"> Associated Clinicals 	
Peritoneum & Peritoneal Cavity.	<ul style="list-style-type: none"> Define peritoneum 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 219-221,). ❖ https://teachmeanatomy.info/
	<ul style="list-style-type: none"> Explain the different folds of peritoneum. 	
	<ul style="list-style-type: none"> Describe greater and lesser sacs 	
	<ul style="list-style-type: none"> Enlist the intra and retroperitoneal viscera 	
	<ul style="list-style-type: none"> Discuss vertical tracings of peritoneum 	
	<ul style="list-style-type: none"> Describe arrangement of peritoneum in transverse & Longitudinal section of abdomen 	
	<ul style="list-style-type: none"> Describe arrangement of peritoneum in transverse section of male pelvis 	
	<ul style="list-style-type: none"> Explain arrangement of peritoneum in transverse section of female pelvis 	
	<ul style="list-style-type: none"> Explain the layers, folds, recesses and compartments of peritoneum with their clinical importance 	
	<ul style="list-style-type: none"> Describe peritonitis 	
	<ul style="list-style-type: none"> Enumerate the signs and symptoms of peritonitis 	
	<ul style="list-style-type: none"> Treat peritonitis by antibiotics and peritoneal dialysis 	
Small Intestine	<ul style="list-style-type: none"> Describe the different parts of duodenum with their anatomical differences 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 239, 241, 244, 245, 325, 436). ❖ https://www.kenhub.com/en/library/anatomy/the-digestive-system
	<ul style="list-style-type: none"> Enumerate the relations of different parts of duodenum 	
	<ul style="list-style-type: none"> Discuss its clinical importance 	
	<ul style="list-style-type: none"> Anatomy of Jejunum & Ileum 	
Large Intestine	<ul style="list-style-type: none"> Enlist various parts of large intestine 	

	<ul style="list-style-type: none"> • Demonstrate gross anatomical features of different parts of large intestine • Enlist intra and retroperitoneal parts of large intestine 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 227,246,248, 325). ❖ https://www.kenhub.com/en/library/anatomy/the-digestive-system
Liver and pancreas	<ul style="list-style-type: none"> • Describe formation of hepatic diverticulum • Describe histogenesis of liver during intrauterine life • Describe formation of various ligaments of liver. • Discuss congenital abnormalities of liver • Differentiate between exocrine and endocrine pancreas. • Discuss the cellular structure and function of exocrine pancreatic acinus and ducts. 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 267-268, 272-278, 282,323, 395). ❖ https://www.kenhub.com/en/library/anatomy/the-digestive-system
Vasculature of GIT (Blood Supply, Venous drainage, Lymphatic drainage)	<ul style="list-style-type: none"> • Explain the applied anatomy of the aorta • Explain origin, course, branches and distribution of celiac trunk • Discuss formation, course and parts of portal vein • Enumerate relations and tributaries of portal vein • Define portal hypertension • Discuss Major Lymphatic Channels 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 228-233, 249-250, 263-285). ❖ http://www.anatomyzone.com 3D anatomy
Rectum & Anal Canal	<ul style="list-style-type: none"> • Discuss the location and extent of rectum • Describe the internal and external features of rectum • Discuss peritoneal reflections rectouterine, rectovesical fossae and their clinical significance • Enumerate relations of rectum • Discuss blood supply, nerve supply, venous and lymphatic drainage • Describe the basis and features of rectal prolapsed • Discuss location and extent of anal canal • Describe external and internal features of Anal Canal • Discuss features of anal sphincters • Tabulate relations of the anal canal with the surrounding structures • Describe the Blood supply, venous and lymphatic drainage & innervations of anal canal • Discuss anal continence • Differentiate between internal and external hemorrhoids 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 239, 248,253 368-371,436,438). ❖ http://www.anatomyzone.com 3D anatomy
Innervation of Abdominal Viscera's	<ul style="list-style-type: none"> • Discuss cutaneous & Somatic innervation of GIT • Describe Autonomic innervation of GIT 	❖ Clinical Oriented Anatomy by Keith L. Moore.7 TH Edition. (Chapter 2, Page 301-305). ❖ http://www.anatomyzone.com 3D anatomy

Practicals				
Topic	At the end of practical students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Tongue & salivary glands	<ul style="list-style-type: none"> Identify slides of tongue & glands under microscope 	P	Skill lab	OSPE
	<ul style="list-style-type: none"> Illustrate histological structure of tongue & salivary glands 	C2		
	<ul style="list-style-type: none"> Write two points of identification 	C1		
Esophagus	<ul style="list-style-type: none"> Identify slide of Esophagus under microscope 	P	Skill lab	OSPE
	<ul style="list-style-type: none"> Illustrate histological structure of Esophagus 	C2		
	<ul style="list-style-type: none"> Write two points of identification 	C1		
Stomach	<ul style="list-style-type: none"> Identify slide of Stomach under microscope 	P	Skill lab	OSPE
	<ul style="list-style-type: none"> Illustrate histological structure of Stomach 	C2		
	<ul style="list-style-type: none"> Write two points of identification 	C1		
	<ul style="list-style-type: none"> Differentiate mucosa of cardiac, fundus, body and pyloric end of stomach 	C2		
Liver, Gall bladder & Pancreas	<ul style="list-style-type: none"> Identify slides of Liver, Gall bladder & Pancreas under microscope 	P	Skill labs	OSPE
	<ul style="list-style-type: none"> Illustrate histological structures of Liver, Gallbladder & Pancreas 	C2		
	<ul style="list-style-type: none"> Write two points of identification 	C1		
Small Intestine	<ul style="list-style-type: none"> Identify slide of small intestine under microscope 	P	Skill lab	OSPE
	<ul style="list-style-type: none"> Illustrate histological structure of small intestine 	C2		
	<ul style="list-style-type: none"> Write two points of identification 	C1		
Large Intestine	<ul style="list-style-type: none"> Identify slide of Large Intestine under microscope 	P	Skill lab	OSPE
	<ul style="list-style-type: none"> Illustrate histological structure of large intestine 	C2		
	<ul style="list-style-type: none"> Write two points of identification 	C1		

Physiology				
Theory				
Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tools
Introduction to GIT, Electrical activity in GIT Movements of GIT	• Explain the physiologic anatomy of GIT	C2	LGIS	SEQ MCQ VIVA
	• Summarize the functions of GIT	C1		
	• Explain the electrical activity of GIT smooth muscle	C2		
	• Describe the concept of slow waves and spike potentials	C1		
	• Explain resting membrane potential and factors affecting RMP	C2		
	• Explain role of calcium ions in muscle contraction	C2		
	• Describe tonic contraction in GIT smooth muscles	C1		
	• Enumerate different types of movements in GIT	C1		
	• Define propulsive movements	C1		
	• Define mixing movements	C1		
	• Describe sites of peristaltic movement in GIT	C1		
	• Describe stimulus, mechanism and direction of peristaltic movement	C1		
	• Discuss role of Myenteric plexus in peristaltic movement	C2		
	• Explain peristaltic reflex and Law of gut	C2		
	• Describe mechanism and function performed by mixing movements	C1		
Enteric nervous system and GIT reflexes	• Describe physiological anatomy of enteric nervous system	C1	LGIS	SEQ MCQ VIVA
	• Enlist functions of enteric nervous system	C1		
	• Compare and contrast Myenteric and Meissner's plexus	C2		
	• Enumerate neurotransmitters of enteric nervous system	C1		
	• Describe the autonomic regulation of enteric nervous system	C1		
	• Enumerate afferent sensory connections of enteric nervous system	C1		

	• Discuss the physiology of GIT reflexes	C2		
	• Explain GIT reflexes integrated at the level of gut wall, prevertebral sympathetic ganglia and spinal cord/brain stem	C2		
Control of GIT motility and factors affecting GIT blood flow	• Enumerate hormones of GIT	C2	LGIS	SEQ MCQ VIVA
	• Describe the hormonal control of GIT motility	C1		
	• Explain site of secretion, stimuli for secretion and actions of Gastrin, Cholecystokinin, Secretin, Gastric inhibitory peptide and Motilin	C2		
	• Discuss the factors affecting GIT blood flow	C2		
	• Recall anatomy of GIT blood supply	C1		
	• Explain splanchnic circulation and hepatic portal circulation	C2		
	• Describe the significance of blood flow to liver through portal vein	C1		
	• Describe special organization of blood flow through intestinal villus	C1		
	• Explain factors affecting gastrointestinal blood flow	C2		
	• Describe counter current blood flow in villi.	C1		
	• Explain nervous control of GIT blood supply	C2		
	• Discuss physiological importance of sympathetic vasoconstriction in GIT under special conditions	C2		
Swallowing1 and (Mastication and Saliva)	• Describe the secretion and composition of saliva and its physiologic roles	C1	LGIS	SEQ MCQ VIVA
	• Describe the nervous regulation of saliva	C1		
	• Describe mastication	C1		
	• Enumerate functions of mastication	C1		
	• Explain role of teeth and muscles of mastication	C2		
	• Describe the steps and nervous control center of chewing reflex	C1		
	• Introduce swallowing	C1		
	• Enumerate stages of swallowing (voluntary/involuntary)	C1		

	<ul style="list-style-type: none"> • Explain in detail each stage of swallowing <ul style="list-style-type: none"> ○ Voluntary stage Mechanism ○ Pharyngeal stage (reflex act) <ul style="list-style-type: none"> ▪ Stimulus, receptors, afferents, center, efferent, effectors, response ▪ Relate pharyngeal stage with process of respiration ▪ Esophageal stage 	C2		
	<ul style="list-style-type: none"> • Primary peristalsis Secondary peristalsis (stimulus, afferent, center, efferent, response) 	C2		
Swallowing -II	<ul style="list-style-type: none"> • Describe physiological anatomy and function of Lower esophageal sphincter 	C1	LGIS	SEQ MCQ VIVA
	<ul style="list-style-type: none"> • Explain receptive relaxation of stomach with nervous pathway 	C2		
	<ul style="list-style-type: none"> • Describe physiological anatomy and function of distal end of esophagus 	C1		
Clinical disorders of swallowing (Achalasia cardia, vomiting & nausea)	<ul style="list-style-type: none"> • Define Achalasia cardia 	C1	LGIS	SEQ MCQ VIVA
	<ul style="list-style-type: none"> • Describe causes, effects and treatment of achalasia cardia 	C1		
	<ul style="list-style-type: none"> • Define vomiting 	C1		
	<ul style="list-style-type: none"> • Describe stimuli & nervous pathway of vomiting 	C1		
	<ul style="list-style-type: none"> • Discuss act of vomiting 	C2		
	<ul style="list-style-type: none"> • Describe chemoreceptor trigger zone 	C1		
	<ul style="list-style-type: none"> • Define nausea 	C1		
	<ul style="list-style-type: none"> • Enlist causes of nausea 	C2		
Regulation of Stomach emptying	<ul style="list-style-type: none"> • Discuss in detail gastric factors that promote emptying and duodenal factors that inhibit emptying 	C2	LGIS	SEQ MCQ VIVA
	<ul style="list-style-type: none"> • Explain the role of enterogastric nervous reflexes and hormonal feedback 	C2		
Motor functions of	<ul style="list-style-type: none"> • Recall physiological anatomy of stomach 	C1		

stomach	<ul style="list-style-type: none"> Describe motor functions of stomach in detail <ol style="list-style-type: none"> Storage Mixing and propulsion of food chyme and Hunger contractions Stomach emptying Role of pyloric pump 	C1	LGIS	SEQ MCQ VIVA
	<ul style="list-style-type: none"> Discuss role of pyloric sphincter 	C2		
Gastric juice-I and Digestion in stomach Physiological barrier protecting development of peptic ulcer	<ul style="list-style-type: none"> Describe the secretion of gastric juice. <ol style="list-style-type: none"> Describe the basic mechanism of HCl secretion. Describe the secretion and activation of pepsinogen Describe the secretion of intrinsic factor Describe the secretion of mucous and gastrin Describe the regulation of gastric acid and pepsinogen secretion 	C1	LGIS	SEQ MCQ VIVA
	<ul style="list-style-type: none"> Summarize the digestive process occurring in stomach 	C1		
	<ul style="list-style-type: none"> Discuss the role of gastric juice, hormones and enzymes acting in stomach 	C2		
	<ul style="list-style-type: none"> Discuss sites, causes and physiological factors preventing peptic ulcer 	C2		
Liver & gall bladder, liver and biliary secretions	<ul style="list-style-type: none"> Recall physiological anatomy of liver & portal circulation 	C1	LGIS	SEQ MCQ VIVA
	<ul style="list-style-type: none"> Describe in detail metabolic and non metabolic functions of liver 	C1		
	<ul style="list-style-type: none"> Explain the mechanism of secretion of bile. 	C2		
	<ul style="list-style-type: none"> Explain the functions of biliary tree. 	C2		
	<ul style="list-style-type: none"> Describe the composition of bile. 	C1		
	<ul style="list-style-type: none"> Explain the role of bile in fat digestion. 	C2		
	<ul style="list-style-type: none"> Explain the formation of gall stones. 	C2		
LFTs and jaundice	<ul style="list-style-type: none"> Enlist liver functions test 	C1	LGIS	SEQ MCQ
	<ul style="list-style-type: none"> Describe liver function tests 	C1		

	• Discuss in detail pathophysiology of jaundice	C2		VIVA
Cirrhosis & portal hypertension	• Describe causes and effects of cirrhosis	C1	LGIS	SEQ
	• Describe causes and effects of portal hypertension	C1		MCQ VIVA
Physiology of pancreas Pancreatic secretions	• Discuss composition of pancreatic secretions	C2	LGIS	SEQ
	• Describe mechanism of secretion of bicarbonate ions	C1		MCQ
	• Describe the regulation and phases of pancreatic secretion.	C1		VIVA

Digestion and Absorption –I (digestion and absorption of carbohydrates and proteins)	• Enumerate dietary sources of carbohydrates	C1	LGIS	SEQ MCQ VIVA
	• Describe the structure of villi.	C1		
	• Enumerate the features of small intestine which increase its surface area	C1		
	• Explain in detail mechanism of absorption of fluids, ions & carbohydrates	C2		
	• Enumerate dietary sources of proteins.	C1		
	• Describe the role of hydrolysis in digestion of food.	C1		
	• Explain in detail the digestion of proteins with emphasis on enzymes at relevant steps.	C2		
	• Describe the sites of absorption	C1		
Digestion and absorption-II (digestion and absorption of lipids)	• Enumerate dietary sources of fats	C1	LGIS	SEQ MCQ VIVA
	• Explain in detail the digestion of lipids in relation to bile	C2		
Movements & functions of large intestine (motor functions of large gut and defecation) Flatus & constipation	• Recall functions of large intestine	C1	LGIS	SEQ MCQ VIVA
	• Discuss in detail mixing and propulsive movements	C2		
	• Explain the role of Gastrocolic & Duodenocolic reflex in	C2		
	• large intestine motility	C2		
	• Enumerate causes of empty rectum	C1		
	• Explain defecation reflex, its importance and nervous control	C2		
	• Discuss composition of feces	C2		
	• Enlist causes of flatus	C1		
	• Discuss causes and effects of constipation	C2		

Hormones of GIT	• Explain the general principles of alimentary tract secretion	C2	LGIS	SEQ MCQ VIVA
	• Enlist the stimuli for alimentary tract secretion	C1		
	• Describe the basic mechanism of secretion by glandular cells	C1		
	• Elaborate the role of autonomic stimulation on glandular secretion	C2		
Small intestine motility, Diarrhea, malabsorption & sprue, ulcerative colitis and paralytic ilius	• Enlist types of movements of small intestine	C1	LGIS	SEQ MCQ VIVA
	• Discuss in detail mixing contractions and propulsive movements	C2		
	• Describe peristaltic rush	C1		
	• Explain functions of ileocecal valve and feedback control of ileocecal sphincter	C2		
	• Discuss causes, types and effects of diarrhea, malabsorption and sprue	C2		
	• Discuss causes and effects of Ulcerative colitis & paralytic ilius	C2		

Topics Of SDL	Learning Objectives Students Should Be Able To	Learning Resources
Introduction to GIT, electrical activity in GIT, Enteric Nervous System and GIT reflexes	<ul style="list-style-type: none"> • Introduction • Role of GIT in control system • Concept of Enteric nervous system • GIT reflexes and its clinical correlation 	<ul style="list-style-type: none"> ❖ Ganong's Review of Medical Physiology.25TH Edition. Overview of gastrointestinal function andregulation (Chapter 25, Page 453,467,472). ❖ Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Digestive System (Chapter 21Page 691,700) ❖ Physiology by Linda S. Costanzo 6th Edition. Gastrointestinal Physiology (Chapter 8. Page 339) ❖ Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 6.Gastrointestinal System. (Chapter 43, Page 681) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. Gastrointestinal Physiology. Section 12. (Chapter 63, Page 787)
Gastric secretion, digestion in stomach, peptic ulcer and gastritis	<ul style="list-style-type: none"> • Gastric secretion and role in digestion • Peptic ulcer disease • Type of gastritis and clinical importanceof gastritis • Investigations to diagnose gastritis 	<ul style="list-style-type: none"> ❖ Ganong's Review of Medical Physiology. Overview of gastrointestinal function and regulation(Chapter 25, Page 455). ❖ Physiology by Linda S. Costanzo 6th Edition. Gastrointestinal Physiology (Chapter 8. Page356,360) ❖ Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 6.Gastrointestinal System. (Chapter 44, Page 706) (Chapter 45, Page 720,726) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition.

		Gastrointestinal Physiology. Section 12. (Chapter 65, Page 809,811)
Small intestine motility and malabsorption (sprue, paralytic ileus and Crohn's disease)	<ul style="list-style-type: none"> ❖ Factors affecting motility of small intestine ❖ Concept of absorption of nutrients ❖ Importance of history in diagnosis of various malabsorption diseases ❖ Inflammatory bowel disease 	<ul style="list-style-type: none"> ❖ Ganong's Review of Medical Physiology. 25TH Edition, Gastrointestinal motility. (Chapter 27, Page 495) ❖ Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Digestive System (Chapter 21, Page 697) ❖ Physiology by Linda S. Costanzo 6th Edition. Gastrointestinal Physiology (Chapter 8. Page 348) ❖ Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Section 6. Gastrointestinal System. (Chapter 44, Page 690, 710)
		<ul style="list-style-type: none"> ❖ Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Gastrointestinal Physiology. Section 12. (Chapter 64, Page 797, 802)
Intestinal secretion and its functions, pancreatic juice, its composition and functions	<ul style="list-style-type: none"> • Intestinal secretions and action • Anatomy of pancreas and its blood supply • Composition of pancreatic juice and its role in absorption • Function of pancreas 	<ul style="list-style-type: none"> ❖ Ganong's Review of Medical Physiology. 25TH Edition. Overview of gastrointestinal function and regulation (Chapter 25, Page 460). ❖ Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Digestive System (Chapter 21, Page 709) ❖ Physiology by Linda S. Costanzo 6th Edition. Gastrointestinal Physiology (Chapter 8. Page 366, 371) ❖ Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Section 6. Gastrointestinal System. (Chapter 45, Page 738, 739) ❖ Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Gastrointestinal Physiology. Section 12. (Chapter 65, Page 814, 820)
Pancreatitis, overall mechanism of digestion and absorption of intestine (amino acids, fatty acids and glucose)	<ul style="list-style-type: none"> • Pancreatitis • Conclusion of digestion and absorption of nutrients. • Clinical correlation with pancreatic enzymes. • Hormones secreted by pancreas 	<ul style="list-style-type: none"> ❖ Ganong's Review of Medical Physiology. 25TH Edition. Digestion, Absorption and Nutritional Principles. (Chapter 2, Page 475) ❖ Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Digestive System (Chapter 21, Page 703-710, 715) ❖ Physiology by Linda S. Costanzo 6th Edition. Gastrointestinal Physiology (Chapter 8. Page 374) ❖ Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Section 6. Gastrointestinal System. (Chapter 47, Page 770)(Chapter 48, Page 785) ❖ Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Gastrointestinal Physiology. Section 12. (Chapter 66, Page 823)

Motor function of large gut,defecation reflex	<ul style="list-style-type: none"> • Motor function of large gut • Inflammatory bowel disease • Defecation reflex • Concept of Hemorrhoids 	<ul style="list-style-type: none"> ❖ Ganong’s Review of Medical Physiology.25TH Edition, Gastrointestinal motility. (Chapter 27,Page 495) ❖ Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Digestive System (Chapter 21,Page 720) ❖ Physiological Basis of Medical Practice by Best & Taylor’s.13th Edition. Section 6.Gastrointestinal System. (Chapter 44,Page 713) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. Gastrointestinal Physiology.Section 12. (Chapter 64,Page 804)
Pathophysiology (vomiting, diarrhea, constipation, ulcerative colitis, megacolon and carcinoma of colon)	<ul style="list-style-type: none"> • Symptomsrelated to GIT • Clinical role of various symptoms • Overview of Carcinoma of stomach, smalland large intestine 	<ul style="list-style-type: none"> ❖ Ganong’s Review of Medical Physiology.25TH Edition, Gastrointestinal motility. (Chapter 27,Page495) ❖ Physiology by Linda S. Costanzo 6th Edition. Gastrointestinal Physiology (Chapter 8. Page 385) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. Gastrointestinal Physiology.Section 12. (Chapter 67, Page 833)

Topic	Learning Objectives Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tools
Introduction to GIT	• Enlist general four functions performed by GIT	C1	SGD	SEQ MCQ VIVA
	• Recall physiological anatomy and blood flow through GIT	C1		
	• Briefly discuss electrical activity of GIT smooth muscle	C1		
Swallowing	• Discuss in detail the three stages of swallowing	C2	SGD	SEQ MCQ VIVA
	• Briefly discuss physiological anatomy of lower esophageal sphincter and distal end of esophagus and state their functional importance	C2		
Functions of stomach	• Recall physiological anatomy of stomach	C1	SGD	SEQ MCQ VIVA
	• Describe motor functions of stomach including storage, mixing, propulsion and stomach emptying.	C1		
	• Discuss in detail gastric factors that promote emptying	C2		
	• Explain the role of enterogastric nervous reflexes and hormonal feedback.	C2		
Liver functions	• Recall physiological anatomy of liver	C1	SGD	SEQ MCQ VIVA
	• Discuss formation and storage of bile	C2		
	• Enlist and describe all functions performed by liver	C1		
Digestion and	• Describe in detail the process of digestion of carbohydrates, proteins and fats with special emphasis on enzymes involved at each step	C1		SEQ

absorption	<ul style="list-style-type: none"> Discuss special features of small and large intestine to promote absorptive process and mechanism of absorption in detail 	C2	SGD	MCQ VIVA
Large intestine	<ul style="list-style-type: none"> Recall movements and functions of large intestine 	C1	SGD	SEQ MCQ VIVA
	<ul style="list-style-type: none"> Enumerate causes of empty rectum 	C1		
	<ul style="list-style-type: none"> Explain defecation reflex, its importance and nervous control 	C2		
	<ul style="list-style-type: none"> Explain GIT reflexes integrated at the level of gut wall, prevertebral sympathetic ganglia and spinal cord/brain stem. 	C2		

Topic	At the end of this skill lab, student should be able to illustrate:	Learning Domain	Teaching Strategy	Assessment Tool
Sense of taste	<ul style="list-style-type: none"> Apparatus identification 	P	Skill lab	OSPE
	<ul style="list-style-type: none"> Principle 	C1		
	<ul style="list-style-type: none"> Procedure 	P		
	<ul style="list-style-type: none"> Precautions 	C1		
	<ul style="list-style-type: none"> Recall taste modalities, taste pathway & abnormalities of taste 	C1		
Examination of sense of smell	<ul style="list-style-type: none"> Apparatus identification 	P	Skill lab	OSPE
	<ul style="list-style-type: none"> Principle 	C1		
	<ul style="list-style-type: none"> Procedure 	P		
	<ul style="list-style-type: none"> Precautions 	C1		
	<ul style="list-style-type: none"> Recall Olfactory pathways and abnormalities of olfaction 	C1		
Examination of superficial reflexes	<ul style="list-style-type: none"> Apparatus identification 	C1	Skill lab	OSPE
	<ul style="list-style-type: none"> Principle 	C1		
	<ul style="list-style-type: none"> Procedure 	A,P		
	<ul style="list-style-type: none"> Precautions 	P		
	<ul style="list-style-type: none"> Recall reflex arc 	C1		
	<ul style="list-style-type: none"> Recall effects of UMNL & LMNL on reflexes 	C1		
Examination of deep reflexes	<ul style="list-style-type: none"> Apparatus identification 	C1	Skill lab	OSPE
	<ul style="list-style-type: none"> Principle 	C1		
	<ul style="list-style-type: none"> Procedure 	A,P		
	<ul style="list-style-type: none"> Precautions 	P		
	<ul style="list-style-type: none"> Recall reflex arc 	C1		
	<ul style="list-style-type: none"> Recall effects of UMNL & LMNL on reflexes 	C1		

Biochemistry				
Theory				
Topic	Learning Objectives At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Introduction to Carbohydrate metabolism	<ul style="list-style-type: none"> Understand metabolic pathways Discuss glucose entry into the cells 	C2 C2	LGIS	MCQs, SAQs Viva
Glycolysis and Fates of Pyruvate	<ul style="list-style-type: none"> Explain types, reactions and regulation of Glycolysis Describe fates of Pyruvate Explain related clinical disorders 	C2 C2 C3	LGIS	MCQs, SAQs Viva
Gluconeogenesis	<ul style="list-style-type: none"> Discuss substrates, reactions and regulation of Gluconeogenesis 	C2	LGIS	MCQs, SAQs Viva
Glycogen metabolism	<ul style="list-style-type: none"> Explain the steps and regulation of glycogenesis and glycogenolysis 	C2	LGIS	MCQs, SAQs Viva
Metabolism of Individual Sugars	Describe the metabolism of individual sugars Explain related clinical disorders	C2 C3	LGIS	MCQs, SAQs Viva
HMP Shunt and G6PD deficiency	Explain the pathway of HMP shunt Discuss uses of NADPH Describe G6PD deficiency	C2 C2 C3	LGIS	MCQs, SAQs Viva
GIT Digestive juices and Hormones	Describe the composition and role of digestive juices Explain role of gastrointestinal hormones Understand related clinical disorders	C2 C2 C3	LGIS	MCQs, SAQs Viva
	Understand BMI and BMR	C2		MCQs, SAQs

Nutrition	Explain the role of different dietary constituents	C2	LGIS	Viva
	Understand related clinical disorders	C3		
LFTs and Jaundice	Discuss Liver function tests and Jaundice	C3	LGIS	MCQs, SAQs Viva
Digestion and Absorption	Explain the digestion and absorption of carbohydrates, lipids and proteins	C2	LGIS	MCQs, SAQs Viva
	Discuss the role of different digestive enzymes	C2		
	Describe related clinical disorders	C3		

Topic	Learning Objectives Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Saliva	<ul style="list-style-type: none"> Explain formation, composition & biochemical functions 	C2	SGD	MCQs SAQs Viva
Gluconeogenesis & its regulation	<ul style="list-style-type: none"> Discuss substrates, reactions and regulation of Gluconeogenesis 	C2	SGD	MCQs SAQs Viva
LFT's Jaundice	<ul style="list-style-type: none"> Discuss Liver function tests and Jaundice 	C3	SGD	MCQs SAQs Viva

Topics of SDL	Learning Objectives Students Should Be Able To	References
Carbohydrate Metabolism & Glycolysis	<ul style="list-style-type: none"> Understand stages of metabolism Explain transport of glucose across cell membrane Describe steps of glycolysis Discuss regulation of committed steps Explain energy calculation in anaerobic and aerobic conditions Understand pyruvate kinase deficiency 	❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#8, Page 100.

TCA Cycle & Gluconeogenesis	<ul style="list-style-type: none"> Describe steps of TCA cycle Discuss substrates, steps and regulation of gluconeogenesis 	<ul style="list-style-type: none"> ❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#9, Page 120. ❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#10, Page 128.
Glycogen metabolism	<ul style="list-style-type: none"> Explain synthesis and breakdown of glycogen Discuss glycogen storage diseases 	<ul style="list-style-type: none"> ❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#11, Page 137.
Individual Sugars	<ul style="list-style-type: none"> Describe the metabolism of individual sugar Explain related clinical disorder 	<ul style="list-style-type: none"> ❖ Essentials of Medical Biochemistry Book by Mushtaq Ahmed Edition 9th Volume#1, Chapter#7, Page 186 ❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#19, Page 276, 77.
Digestion of Lipids by Pancreatic Enzymes	<ul style="list-style-type: none"> Explain the digestion and absorption of lipids Discuss the role of pancreatic enzymes in lipid digestion 	<ul style="list-style-type: none"> ❖

Practicals				
Topic	At the End of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Saliva-I	<ul style="list-style-type: none"> Understand Normal constituents of saliva Discuss effects of saliva on digestion of starch 	P	Skill Lab	OSPE
Saliva-II	<ul style="list-style-type: none"> Discuss the role of saliva in digestion of carbohydrates 	P	Skill Lab	OSPE
Bile	<ul style="list-style-type: none"> Describe the composition and role of bile in digestion Understand related disorder 	P	Skill Lab	OSPE
Estimation of ALT & ALP	<ul style="list-style-type: none"> Perform estimation of ALT Perform estimation of ALP 	P	Skill Lab	OSPE
Analysis of Food Component (Wheat)	<ul style="list-style-type: none"> Perform to analyse the different constituents of wheat 	P	Skill Lab	OSPE

Orientation Sessions of Medical Education

Content

- Orientation Session on Curricular Reform RMU & Feedback of Year 2023
 - Student Session on Standardization of Teaching Strategies
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Department of Medical Education			
Theory			
Topic	Learning Objectives At the end of the lecture the student should be able to	Teaching Strategy	Assessment Tool
Orientation of Integrated Modular system, Intoduction to study guides and RMU Policies	<ul style="list-style-type: none">• Understand the concept of integration• Understand the orientation of integrated modular curriculum of RMU• How to use Study Guides• Introduction to different policies of RMU	LGIS	MCQs
Standardization of Teaching Strategies	<ul style="list-style-type: none">• Discuss Standardization of Different Teaching Strategies used in Integrated Model of RMU.	LGIS	MCQs

Basic and Clinical Sciences (Vertical Integration)

Anatomy, Physiology & Biochemistry			
Theory			
Subject	Topic	At the End Of Lecture Students Should Be Able To	Learning Domain
Anatomy	• Acute Appendicitis	Apply basic knowledge of subject to study clinical case.	C3
	• Liver Cirrhosis	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• Peptic Ulcer	Apply basic knowledge of subject to study clinical case.	C3
	• Food Poisoning	Apply basic knowledge of subject to study clinical case.	C3
Biochemistry	• Glucose 6 Phosphate Dehydrogenase Deficiency	Apply basic knowledge of subject to study clinical case.	C3
	• Lactose Intolerance	Apply basic knowledge of subject to study clinical case.	C3

Community Medicine				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Concept of Health and Disease	By the end of the session students will be able to;	C1	LGIS	MCQs
	• Define Health			
	• Identify different phases of Health	C1		
	• Elaborate concepts of Health	C2		
	• Acknowledge Dimensions of Health	C2		
	• Elucidate Dimensions of health	C2		
	• Appreciate Determinants of Health	C2		
	• Describe the types of determinants	C2		
Infectious Disease Epidemiology				
	• Define important terms related to infectious disease epidemiology.	C1		

Definitions			LGIS	MCQs
Epidemic, endemic and pandemic	<ul style="list-style-type: none"> Differentiate between epidemic, endemic and pandemic 	C2		
Dynamics of disease transmission	<ul style="list-style-type: none"> Describe the dynamics of transmission of disease 	C2		
Incubation period	<ul style="list-style-type: none"> Explain the concept of incubation period and its importance. 	C2		

Medicine				
Theory				
Topic	At the end of the lecture, students should be able to	Learning Domain	Learning Strategy	Assessment Tools
Dysphagia	<ul style="list-style-type: none"> Define and discuss pathophysiology 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Discuss the causes 	C2		
	<ul style="list-style-type: none"> Describe clinical features 	C2		
	<ul style="list-style-type: none"> Describe the management 	C2		
Peptic ulcer	<ul style="list-style-type: none"> Describe Mechanism of digestion in stomach 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Describe Mechanism of APD and GERD 	C2		
	<ul style="list-style-type: none"> Discuss Peptic ulcer formation 	C2		
	<ul style="list-style-type: none"> Enlist Clinical features 	C2		
	<ul style="list-style-type: none"> Enlist Investigations 	C1		
	<ul style="list-style-type: none"> Describe management 	C2		
Jaundice	<ul style="list-style-type: none"> Enlist types of Jaundice 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Discuss changes in Liver 	C2		
	<ul style="list-style-type: none"> Describe clinical features 	C2		
	<ul style="list-style-type: none"> Enlist investigations 	C1		

	<ul style="list-style-type: none"> Discuss management 	C2		
Inflammatory bowel disease	<ul style="list-style-type: none"> Describe features of IBD 	C2	LGIS	MCQs
	<ul style="list-style-type: none"> Classify IBD 	C2		
	<ul style="list-style-type: none"> Describe pathogenesis of IBD 	C2		
	<ul style="list-style-type: none"> Describe histological diagnosis of IBD 	C1		
	<ul style="list-style-type: none"> Enlist complication of IBD 	C1		

List of GIT Module Basic and Clinical Sciences Vertical Integration Lectures						
Sr. #	Date/Day	Week	Time	Department	Topic of Lectures	Teacher's Name & Contact #
1.	29-02-2024 Thursday	1 st Week	09:20am-10:10am	Community Medicine	Concept of health & disease (Even)	Dr. Rizwana Shahid 0320-5511684
					Epidemiology of infectious diseases & Basic Concepts (Odd)	Dr. Afifa kalsoom 0333-5506597
2.	01-03-2024 Friday	1 st Week	10:00am-11:00am	Quran Translation	Imaniat I (Even)	Mufti Naeem Sherazi 03005580299
					Ibadat I (Odd)	Dr Fahd 03005156800
3.	01-03-2024 Friday	1 st Week	11:00am-12:00pm	Community Medicine	Epidemiology of infectious diseases & Basic Concepts (Odd)	Dr. Afifa kalsoom 0333-5506597
					Concept of health & disease (Even)	Dr. Rizwana Shahid 0320-5511684
4.	02-03-2024 Saturday	1 st Week	9:20am – 10:10am	Behavioral Sciences	Eating Disorders	Dr. Sadia Yasir (Even)
						Dr. Zona Tahir (Odd)
5.	04-03-2024 Monday	2 nd Week	11:20am-12:10pm	Bioethics & Research	Pakistan Medical & dental council Code of Ethics (even)	Dr. Sidra Hamid 0331-5025147
					Introduction to Descriptive Statistics (Odd)	Dr. Rizwana Shahid 0320-5511684
6.	08-03-2024 Friday	2 nd Week	08:00am-09:00am	Medicine	Peptic ulcer (Even)	Dr Javeria Khan 03345444083
					Peptic ulcer (Odd)	Dr Anum Abbas 03455057646

7.	08-03-2024 Friday	2 nd Week	10:00am- 11:00am	Quran Translation-II	Ibadat-II (Even)	Dr Fahd 03005156800
					Imaniyat -II (Odd)	Mufti Naeem Sherazi 03005580299
8.	08-03-2024 Friday	2 nd Week	11:00am 12:00pm	Quran Translation-II	Ibadat-II (Even)	Mufti Naeem Sherazi 03005580299
					Imaniyat -II (Odd)	Dr Fahd 03005156800
9.	09-03-2024 Saturday	2 nd Week	9:20am – 10:10am	Radiology & Artificial Intelligence	Medical Imaging of abdomen-I	Dr. Quratul Ain (Even) Dr. Aneeqa Saleem (Odd)
10.	12-03-2024 Tuesday	3 rd Week	11:10am- 11:50am	Research -I & Bioethics	Introduction to descriptive statistics (Even)	Dr. Rizwana Shahid 0320-5511684
					Pakistan Medical & dental council Code of Ethics (Odd)	Dr. Sidra Hamid
11.	13-03-2024 Wednesday	3 rd Week	09:20am- 10:10am	Research-II LGIS	Classification of different types of data	Dr. Rizwana Shahid 0320-5511684 Dr.
12.	14-03-2024 Thursday	3 rd Week	09:20am- 10:10am	Medicine	State of the Art Lecture Jaundice	Worthy Vice Chancellor Prof. Dr. Muhammad Umar
13.	14-03-2024 Thursday	3 rd Week	11:10am- 11:50am	Family Medicine	Common Abdominal diseases	Dr. Sadia
						Dr. Ishtiaq
14.	15-03-2024 Friday	3 rd Week	10:00am 11:00am	Quran Translation-III	Ibadaat-3	Dr Fahd 03005156800 (Even)
					Imaniat-3	Mufti Naeem Sherazi 03005580299 (Odd)
15.	15-03-2024 Friday	3 rd Week	11:00am 12:00pm	Quran Translation-III	Imaniat-3	Mufti Naeem Sherazi 03005580299 (Even)
					Ibadaat-3	Dr Fahd 03005156800 (Odd)
16.	16-03-2024 Saturday	3 rd Week	11:10am- 11:50am	Pak Studies/Islamiyat	Tehreek-E-Pakistan Islaahi Tehreekain	Qari Aman Ullah 03467598528
					Akhirat-I	Mufti Naeem Sherazi 03005580299
17.	19-03-2024 Tuesday	4 th Week	10:30am- 11:10am	Research-III	Scales of Data Measurement	Dr. Rizwana Shahid 0320-5511684
						Dr. Afifa kalsoom 0333-5506597
						Dr. Ishtiaq
18.	21-03-2024	4 th Week	11:10am-	Research-IV	Research IV: Measures of central	Dr. Rizwana Shahid 0320-5511684

	Thursday		12:00pm		Tendency	Dr. Afifa kalsoom 0333-5506597
19.	22-03-2024 Friday	4 th Week	08:00am- 09:00am	Pak Studies/Islamiyat-I	Toheed	Mufti Naeem Sherazi 03005580299
					Qayam e Pakistan, Aghraaz o Maqasid	Qari Aman Ullah 03467598528
20.	22-03-2024 Friday	4 th Week	09:00am- 10:00am	Pak Studies/Islamiyat-I	Qayam e Pakistan, Aghraaz o Maqasid	Qari Aman Ullah 03467598528
					Toheed	Mufti Naeem Sherazi 03005580299
21.	22-03-2024 Friday	4 th Week	10:00am- 11:00am	Entrepreneurship	Ideate Initial Idea	Dr. Asif Maqsood & Dr. Sidra Hamid
22.	23-03-2024 Saturday	4 th Week	11:50am – 01:00pm	Pak Studies/Islamiyat	Tehreek-e-Aligarh, Sir Syed Ahmad Khan	Qari Aman Ullah (Even)
					Akhirat -II	Mufti Naeem Sherazi (Odd)
23.	27-03-2024 Wednesday	5 th Week	10:30am- 11:10am	Research-V	Compute and Interpret measures of central tendency	Dr. Rizwana Shahid 0320-5511684 Dr. Afifa kalsoom 0333-5506597
24.	28-03-2024 Thursday	5 th Week	10:30am- 11:10am	Research-VI	Measures of dispersion/Secondary Data Analysis	Dr. Rizwana Shahid 0320-5511684 Dr. Afifa kalsoom 0333-5506597
25.	29-03-2024 Friday	5 th Week	11:10am- 11:50am	Radiology & Artificial Intelligence	Medical Imaging of abdomen-II	Dr. Sana Yaqoob (Even) \ 0342-2064666 Dr. Saba Bint e Kashmir (Odd)

Spirally Integrated Courses / General Education Cluster (GEC) Courses

Content

- **Longitudinal Themes**
 - **The Holy Quran Translation**
 - **Biomedical Ethics & Professionalism**
 - **Behavioural Sciences**
 - **Family Medicine**
 - **Artificial Intelligence (Innovation)**
 - **Integrated Undergraduate Research Curriculum (IUGRC)**
 - **Enterpeneurship**
 - **Digital Literacy Module**
 - **Early Clinical Exposure (ECE)**
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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
Imaniyat (Faith)	<ul style="list-style-type: none"> Introduction of concept of Imaniyat Corelate the concept of faith in different situation of life 	C2	LGIS	SAQ
Tauheed (Oneness of God)	<ul style="list-style-type: none"> Introduction of Quranic Concept of Tauheed Corelate the concept of tauheed in different situation of life 	C2	LGIS	SAQ
Ibadaat (Worship)	<ul style="list-style-type: none"> Introduction of concept of Ibadaat Study of Verses Related to Hajj Impact of Hajj on a Muslim's Life 	C2	LGIS	SAQ
Amr bil Ma'ruf and Nahi anil Munkar (Enjoining Good and Forbidding Evil)	<ul style="list-style-type: none"> Introduction of concept of Amr bil Ma'ruf and Nahi anil Munkar Study of Verses Related to Amr bil Ma'ruf and Nahi anil Munkar Importance of Amr bil Ma'ruf and Nahi anil Munkar in the life of medical doctors 	C2	LGIS	SAQ

Pak Studies/Islamiyat				
Theory				
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Tehreek-E-Pakistan Islaahi Tehreekain	<ul style="list-style-type: none"> Understand the history of Tehreek-E-Pakistan Islaahi Tehreekain. 	C2	LGIS	SAQ
Akhirat-I	<ul style="list-style-type: none"> Introduction of Quranic Concept of Akhriat Corelate the concept of Akhriat in different situation of life 	C2	LGIS	SAQ
Qayam e Pakistan, Aghraaz o Maqasid	<ul style="list-style-type: none"> Understand the history of Qayam e Pakistan, Aghraaz o Maqasid Tehreek-E-Pakistan Islaahi Tehreekain. 	C2	LGIS	SAQ

Toheed	<ul style="list-style-type: none"> • Introduction of Quranic Concept of Tauheed • Corelate the concept of tauheed in different situation of life 	C2	LGIS	SAQ
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Biomedical Ethics & Professionalism				
Theory				
Topic	At the End of The Session, Student Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Pakistan Medical & Dental Council Code of Ethics	At the end of the session students should be able to;	C2	LGIS	SAQ MCQ VIVA
	<ul style="list-style-type: none"> • Appreciate the value of oath and pledge taken by medical student at the time of graduation from medical school 			
	<ul style="list-style-type: none"> • Appraise the importance of principles to be followed by the medical and dental practitioners to fulfil the social contract with the society in order to win the trust of the public in the profession 	C2		
	<ul style="list-style-type: none"> • Cognizant with disciplinary proceedings in case of violation of rules laid down by regulatory body 	C1		

Behavioral Sciences				
Theory				
Topic	At The End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Eating Disorders	<ul style="list-style-type: none"> • To be able to define eating disorders 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> • To be able to describe the types of eating disorders 	C2		
	<ul style="list-style-type: none"> • To make differential diagnosis 	C2		
	<ul style="list-style-type: none"> • To be able to manage such conditions 	C2		

Family Medicine				
Theory				
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Approach to a Patient with abdominal pain	<ul style="list-style-type: none"> Discuss what is abdominal pain 	C2	LGIS-1	MCQs
	<ul style="list-style-type: none"> Discuss its causes 			
	<ul style="list-style-type: none"> Discuss diagnosis & principle of management 			

Radiology & Artificial Intelligence				
Theory				
Topic	At the end of lecture student should be able to	Learning Domain	Teaching Strategy	Assessment Tools
X-ray abdomen	<ul style="list-style-type: none"> Identify normal and abnormal radiographs of abdomen (AP view) 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Identify filling defects (Barium meal and Barium enema) 	C1		
	<ul style="list-style-type: none"> Recognize the correct and incorrect positioning of feeding tubes 	C1		
CT Scan MRI abdomen	<ul style="list-style-type: none"> Identify normal and abnormal CT Scan MRI abdomen 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Discuss co-relation with Artificial Intelligence 	C2		

Integrated Undergraduate Research Curriculum (IUGRC)			
Theory			
Topic	At the End of The Session, Student Should Be Able To	Teaching Strategy	Assessment Tool
Lecture 1: Introduction to Descriptive Statistics	At the end of the session students should be able to;	LGIS	SAQ MCQ VIVA
	• Define & enlist uses of statistical knowledge in research & healthcare profession.		
	• Differentiate descriptive statistics form inferential statistics		
	• Appreciate value of information & precision in scientific decision making		
Lecture 2: Classification of different types of Data	• Describe the concept of data, variable & sources of data with respect to descriptive statistics	LGIS	SAQ MCQ VIVA
	• Enlist data types with examples from medical background		
	• Classify types of data with examples (qualitative & quantitative)		
	• Exercise on the identification of different types of data		
Lecture 3: Scales of Data Measurement	• Enlist types of data measurement scales	LGIS	SAQ MCQ VIVA
	• Elaboration of different types of data measurement scales with example		
	• Enlist different method of data presentation (tables, graphs, diagrams, pie chart, Bar graph, histogram. line diagram scatter diagram, statistical maps, pictogram and ogive curve) according to type of data.		
Lecture 4: Measure of central tendency	• Explain concept of Measures of central tendency with illustrations form medical background	LGIS	SAQ MCQ VIVA
	• Calculate and interpret the different measures of central tendency		
Lecture 5: Measures of	• Explain concept of Measures of dispersion with illustrations form medical background		SAQ
	• Calculate and interpret the different measures of dispersion		

Dispersion		LGIS	MCQ VIVA
Lecture 6: Practice Session	<ul style="list-style-type: none">• Compute and Interpret results of different measures of dispersion form a given data file	LGIS	SAQ MCQ VIVA

Entrepreneurship		
Theory		
Topics	Brief Note	Learning Outcomes
Ideate Initial Idea	<ul style="list-style-type: none">• How it would create value	Understand the concept of ideation in the entrepreneurial context. 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			
Topic	Learning Objectives At the end of the lecture the student should be able to	Teaching Strategy	Assessment Tool
RMU Goes digital	<ul style="list-style-type: none">• Introduction to LMS, CMS and MS Teams.• Inrtorduction to RMU website• How to use HEC digital library• How to use up to date website	LGIS	MCQs

List of Foundation Module Spiral Courses Lectures						
Sr. #	Date/Day	Week	Time	Department	Topic of Lectures	Teacher's Name & Contact #
1.	01-03-2024 Friday	1 st Week	10:00am- 11:00am	Quran Translation	Imaniat I (Even)	Mufti Naeem Sherazi 03005580299
					Ibadat I (Odd)	Dr Fahd 03005156800
2.	02-03-2024 Saturday	1 st Week	9:20am – 10:10am	Behavioral Sciences	Eating Disorders	Dr. Sadia Yasir (Even)
						Dr. Zona Tahir (Odd)
3.	04-03-2024 Monday	2 nd Week	11:20am- 12:10pm	Bioethics & Research	Pakistan Medical & dental council Code of Ethics (even)	Dr. Sidra Hamid 0331-5025147
					Introduction to Descriptive Statistics (Odd)	Dr. Rizwana Shahid 0320-5511684
4.	08-03-2024 Friday	2 nd Week	10:00am- 11:00am	Quran Translation-II	Ibadat-II (Even)	Dr Fahd 03005156800
					Imaniyat -II (Odd)	Mufti Naeem Sherazi 03005580299
5.	08-03-2024 Friday	2 nd Week	11:00am 12:00pm	Quran Translation-II	Ibadat-II (Even)	Mufti Naeem Sherazi 03005580299
					Imaniyat -II (Odd)	Dr Fahd 03005156800
6.	09-03-2024 Saturday	2 nd Week	9:20am – 10:10am	Radiology & Artificial Intelligence	Medical Imaging of abdomen-I	Dr. Quratul Ain (Even) Dr. Aneeqa Saleem (Odd)
7.	12-03-2024 Tuesday	3 rd Week	11:10am- 11:50am	Research -I & Bioethics	Introduction to descriptive statistics (Even)	Dr. Rizwana Shahid 0320-5511684
					Pakistan Medical & dental council Code of Ethics (Odd)	Dr. Sidra Hamid
8.	13-03-2024 Wednesday	3 rd Week	09:20am- 10:10am	Research-II LGIS	Classification of different types of data	Dr. Rizwana Shahid 0320-5511684 Dr.
9.	14-03-2024 Thursday	3 rd Week	11:10am- 11:50am	Family Medicine	Common Abdominal diseases	Dr. Sadia
						Dr. Ishtiaq
10.	15-03-2024 Friday	3 rd Week	10:00am 11:00am	Quran Translation-III	Ibadaat-3	Dr Fahd 03005156800 (Even)
					Imaniat-3	Mufti Naeem Sherazi 03005580299 (Odd)
11.	15-03-2024	3 rd Week	11:00am	Quran Translation-III	Imaniat-3	Mufti Naeem Sherazi 03005580299 (Even)

	Friday		12:00pm		Ibadaat-3	Dr Fahd 03005156800 (Odd)
12.	16-03-2024 Saturday	3 rd Week	11:10am- 11:50am	Pak Studies/Islamiyat	Tehreek-E-Pakistan Islaahi Tehreekain	Qari Aman Ullah 03467598528
					Akhirat-I	Mufti Naeem Sherazi 03005580299
13.	19-03-2024 Tuesday	4 th Week	10:30am- 11:10am	Research-III	Scales of Data Measurement	Dr. Rizwana Shahid 0320-5511684
						Dr. Afifa kalsoom 0333-5506597
						Dr. Ishtiaq
14.	21-03-2024 Thursday	4 th Week	11:10am- 12:00pm	Research-IV	Research IV: Measures of central Tendency	Dr. Rizwana Shahid 0320-5511684
						Dr. Afifa kalsoom 0333-5506597
15.	22-03-2024 Friday	4 th Week	08:00am- 09:00am	Pak Studies/Islamiyat-I	Toheed	Mufti Naeem Sherazi 03005580299
					Qayam e Pakistan, Aghraaz o Maqasid	Qari Aman Ullah 03467598528
16.	22-03-2024 Friday	4 th Week	09:00am- 10:00am	Pak Studies/Islamiyat-I	Qayam e Pakistan, Aghraaz o Maqasid	Qari Aman Ullah 03467598528
					Toheed	Mufti Naeem Sherazi 03005580299
17.	22-03-2024 Friday	4 th Week	10:00am- 11:00am	Entrepreneurship	Ideate Initial Idea	Dr. Asif Maqsood & Dr. Sidra Hamid
18.	23-03-2024 Saturday	4 th Week	11:50am – 01:00pm	Pak Studies/Islamiyat	Tehreek-e-Aligarh, Sir Syed Ahmad Khan	Qari Aman Ullah (Even)
					Akhirat -II	Mufti Naeem Sherazi (Odd)
19.	27-03-2024 Wednesday	5 th Week	10:30am- 11:10am	Research-V	Compute and Interpret measures of central tendency	Dr. Rizwana Shahid 0320-5511684 Dr. Afifa kalsoom 0333-5506597
20.	28-03-2024 Thursday	5 th Week	10:30am- 11:10am	Research-VI	Measures of dispersion/Secondary Data Analysis	Dr. Rizwana Shahid 0320-5511684 Dr. Afifa kalsoom 0333-5506597
21.	29-03-2024 Friday	5 th Week	11:10am- 11:50am	Radiology & Artificial Intelligence	Medical Imaging of abdomen-II	Dr. Sana Yaqoob (Even) \ 0342-2064666 Dr. Saba Bint e Kashmir (Odd)

Block-I

Module No. 2 - Renal

Duration 5 Weeks

Renal Module Team

Module Name : Renal Module
 Duration of module : 05 Weeks
 Coordinator : Dr. Sheena Tariq
 Co-coordinator : Dr. Uzma Kiyani
 Reviewed by : Module Committee

Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Sheena Tariq (Senior Demonstrator of Physiology)
2.	Director DME	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Farzana Fatima
3.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf	3.	Co-coordinator	Dr. Ali Raza (Senior Demonstrator of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Rahat Afzal (Senior Demonstrator of Biochemistry)
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5.	Co-coordinator	Dr. Uzma Kiyani (Senior Demonstrator of Physiology)
6.	Focal Person Anatomy Second Year MBBS	Dr. Maria Tasleem			
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 Year MBBS & Director DME	Prof. Dr. Ifra Saeed 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 Lectures	Dr. Uzma Zafar			
14.	Focal Person Family Medicine	Dr. Sadia Khan			

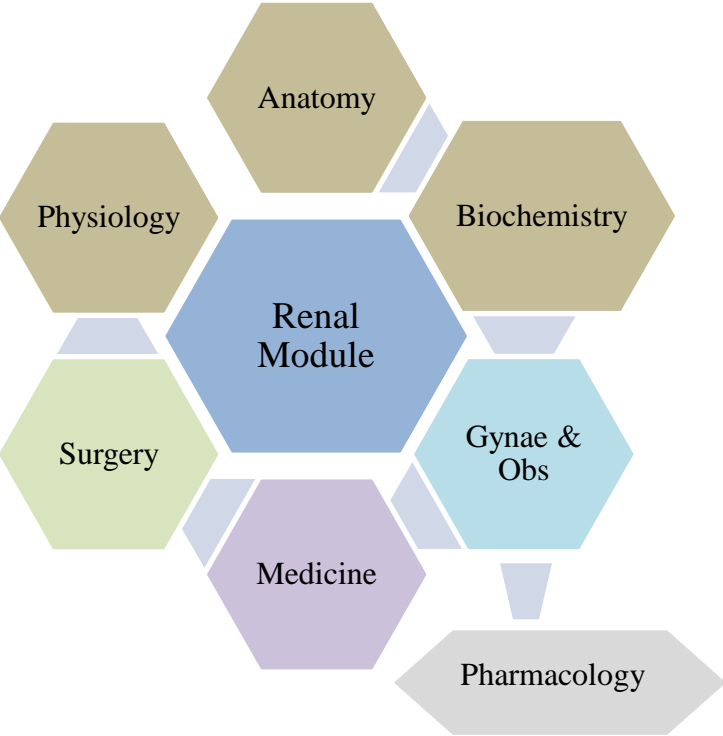
Themes				
Block	Module	Embryology	Histology	Gross Anatomy
I	<ul style="list-style-type: none">Anatomy	<div>Embryology</div> <ul style="list-style-type: none">KidneyUreterUrinary BladderUrethra	<div>Histology</div> <ul style="list-style-type: none">KidneyUreterUrinary Bladder	<ul style="list-style-type: none">Posterior Abdominal Wall & Organs of Urinary System
	<ul style="list-style-type: none">Biochemistry	<ul style="list-style-type: none">Amino Acid Pool Protein Turn Over Nitrogen Balance & transport of Amino Acid,Urea Cycle & DisorderAmino Acid MetabolismAmmonia ToxicityAcid Base in BalanceSerum Electrolyte		
	<ul style="list-style-type: none">Physiology	<ul style="list-style-type: none">Body Fluid Compartments, Volume & osmolarity of ECF NICFPhysiology of Renal System, GFRRegulation of GFR & RBFTubular Reabsorbtion & ScretionMicturition Reflex & AbnomalitiesAcid base balance		
	Spiral Courses			
	<ul style="list-style-type: none">The Holy Quran Translation	<ul style="list-style-type: none">Imaniat 3Ibadat 3Imaniat 4Ibadat 4		
	<ul style="list-style-type: none">Bioethics & Professionalism	<ul style="list-style-type: none">Ethical principles		
	<ul style="list-style-type: none">Radiology & Artificial Intelligence	<ul style="list-style-type: none">Prenatal ultrasonographyContrast Nephropathy		
	<ul style="list-style-type: none">Research Club Activity	<ul style="list-style-type: none">Questionnaire Development (Practical Session-II)Session on data analysis (Practical Session-III)Manuscript writing (Practical Session-IV)		
	<ul style="list-style-type: none">Family Medicine	<ul style="list-style-type: none">Renal Failure		
	Vertical Integration			

	<p>Clinically content relevant to Renal module</p> <ul style="list-style-type: none">• Acute renal failure (Medicine)• Potassium imbalance and its management (Medicine)• CRF & Rehabilitation of patient with CRF(Medicine)• Hydronephrosis / Pyonephrosis (Surgery)• Investigations of urinary tract (Surgery)• Renal calculi (Surgery)• Common renal problems in pregnancy (lower and upper urinary tract infections, hydronephrosis, stress incontinence) (Obstetrics & Gynecology)• Introduction to diuretics (Pharmacology)	
	Entrepreneurship	
	<ul style="list-style-type: none">• Ideate Initial Idea	
	Early Clinical Exposure (ECE)	
	<ul style="list-style-type: none">• Clinical Rotations	<ul style="list-style-type: none">• Cases of Renal failure• Dialysis• Renal Transplant• Ultrasound of Kidney• Plain X-Ray• KUB Nephrotic Syndrome
Clinical Themes		
	<ul style="list-style-type: none">• Pathophysiology and Management of Acute Kidney Injury (AKI)• Chronic Kidney Disease (CKD): Stages and Clinical Features• Role of the Kidney in Hypertension (e.g., renovascular hypertension)• Mechanisms and Management of Nephrotic Syndrome• Diagnosis and Treatment of Urinary Tract Infections (UTIs)• Polycystic Kidney Disease: Genetic and Clinical Aspects• Mechanisms of Renal Stones and Treatment Options• Dialysis: Indications and Principles• Pathophysiology of Glomerulonephritis• Fluid and Electrolyte Imbalances in Clinical Practice	

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 Renal Module



Spiral / General Education Cluster Courses



Module No. 2 – Renal Module

Rationale: The urinary system is an important system of the body, and it is also concerned with homeostasis, and it is essential for survival of individuals. Kidney is the principal organ in the urinary system. It is an essential viscous concerned with maintenance of homeostasis. It performs its function through formation of urine in which hazardous waste products of metabolism, drugs, toxins and excess amounts of water and electrolytes are excreted. Kidneys also help in controlling body fluid volume, arterial blood pressure and acid base balance. Where as prostate gland is also is included in this module as it is concerned with production of semen.

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 urinary system.
 - **Family Medicine**
 - **Biomedical Ethics**
 - **Artificial Intelligence**
 - **Research**

Skills

- Demonstrate effective skill for performing and interpreting various laboratory tests like urine routine examination.
- Demostrate awareness of ethical, legal and social implication of issues related to bioethics.

Attitude

- Demonstrate a **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 Renal Module (Module No. 2)

Anatomy				
Theory				
Topic	Learning Objectives At The End of The Lecture the Student Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Embryology				
Development of Kidney & ureter	<ul style="list-style-type: none"> Enumerate the derivatives of intermediate mesoderm, urogenital and gonadal ridges. 	C1	LGIS	SAQ MCQ VIVA
	<ul style="list-style-type: none"> Describe the stages of development of human kidneys 	C2		
	<ul style="list-style-type: none"> Describe the molecular regulation of kidney development. 	C2		
	<ul style="list-style-type: none"> Correlate positional changes of the kidney with its blood supply 	C1		
	<ul style="list-style-type: none"> Describe different stages of development of ureter from ureteric bud and metanephrogenicblastema. 	C1		
	<ul style="list-style-type: none"> Understand the bio-physiological aspects of kidney & ureter development 	C2		
	<ul style="list-style-type: none"> Enumerate Congenital anomalies of kidney and ureter. 	C3		
	<ul style="list-style-type: none"> Correlate the clinical conditions (polycystic kidney, horseshoe shaped kidney) 	C3		
	<ul style="list-style-type: none"> Understand the preventive and curative health care measures 	C3		
	<ul style="list-style-type: none"> Practice the principles of Bioethics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of AI in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research article 	C3		
Development of urinary bladder & urethra	<ul style="list-style-type: none"> Describe the development of urinary bladder 	C2	LGIS	SAQ MCQ
	<ul style="list-style-type: none"> Understand the bio-physiological aspects of bladder development 	C2		
	<ul style="list-style-type: none"> Discuss the parts of urethra in males and females 	C2		
	<ul style="list-style-type: none"> Describe development of male urethra 	C2		
	<ul style="list-style-type: none"> Describe development of female urethra 	C2		
	<ul style="list-style-type: none"> Discuss the anomalies related to urethra & bladder development 	C3		

	<ul style="list-style-type: none">• Correlate the clinical conditions	C3		VIVA
	<ul style="list-style-type: none">• Understand the preventive and curative health care measures	C3		
	<ul style="list-style-type: none">• Practice the principles of Bioethics	C3		
	<ul style="list-style-type: none">• Apply strategic use of AI in health care	C3		
	<ul style="list-style-type: none">• Read relevant research article	C3		
Histology				
Histology of kidney I (Cortex & Medulla)	<ul style="list-style-type: none">• Discuss the structural components of the nephron.	C2	LGIS	SAQ MCQ VIVA
	<ul style="list-style-type: none">• Discuss the histology of filtration barrier.	C2		
	<ul style="list-style-type: none">• Understand the bio-physiological aspects of filtration	C2		
	<ul style="list-style-type: none">• Distinguish the key microscopic components of the renal cortex and medulla.	C2		
	<ul style="list-style-type: none">• Differentiate the histological appearance of proximal tubule, loop of Henley, distal convulated tubule and collecting duct.	C2		
	<ul style="list-style-type: none">• Correlate the clinical conditions	C3		
	<ul style="list-style-type: none">• Understand the preventive and curative health care measures			
	<ul style="list-style-type: none">• Practice the principles of Bioethics			
	<ul style="list-style-type: none">• Apply strategic use of AI in health care			
	<ul style="list-style-type: none">• Read relevant research article			
Histology of kidney II (Collecting System)	<ul style="list-style-type: none">• Enumerate the component cells of the juxta glomerular apparatus.	C1	LGIS	SAQ MCQ
	<ul style="list-style-type: none">• Discuss the component cells of the juxtaglomerular apparatus	C2		
	<ul style="list-style-type: none">• Discuss the effect of diabetes & hypertension on glomerular filtration rate	C2		
	<ul style="list-style-type: none">• Understand the effect of hypertension on renin angiotensin release	C3		
	<ul style="list-style-type: none">• Correlate the clinical conditions			
	<ul style="list-style-type: none">• Understand the preventive and curative health care measures			

	<ul style="list-style-type: none">Practice the principles of Bioethics	C3		VIVA
	<ul style="list-style-type: none">Apply strategic use of AI in health care			
	<ul style="list-style-type: none">Read relevant research article			
Histology of Urinary bladder	<ul style="list-style-type: none">Describe histological characteristics of urinary bladder.	C2	LGIS	SAQ MCQ VIVA
	<ul style="list-style-type: none">Explain the concept of umbrella cells and Uroplakins.	C2		
	<ul style="list-style-type: none">Explain the concept of internalization	C2		
	<ul style="list-style-type: none">Understand the bio-physiological effects of urinary epithelium	C2		
	<ul style="list-style-type: none">Compare the histological changes of empty and full bladder.	C2		
	<ul style="list-style-type: none">Correlate the clinical conditions	C3		
	<ul style="list-style-type: none">Understand the preventive and curative health care measures			
	<ul style="list-style-type: none">Practice the principles of Bioethics			
	<ul style="list-style-type: none">Apply strategic use of AI in health care			
	<ul style="list-style-type: none">Read relevant research article			
Histology of ureter & urethra	<ul style="list-style-type: none">Describe the microscopic structure of ureter	C2	LGIS	SAQ MCQ VIVA
	<ul style="list-style-type: none">Discuss the histological features of urethra	C2		
	<ul style="list-style-type: none">Distinguish the transition in epithelium in different types of urethra	C2		

	<ul style="list-style-type: none"> Correlate the clinical conditions 	C3		
	<ul style="list-style-type: none"> Understand the preventive and curative health care measures 			
	<ul style="list-style-type: none"> Practice the principles of Bioethics 			
	<ul style="list-style-type: none"> Apply strategic use of AI in health care 			
	<ul style="list-style-type: none"> Read relevant research article 			

Topics	Learning Objectives Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Posterior abdominal wall I (Fascia & Muscles)	<ul style="list-style-type: none"> Describe the fascia of posterior abdominal wall Tabulate the muscles of posterior abdominal wall with reference to, origen, insertion, nerve supply and action, Describe the relations of Psoas major muscle. Correlate the clinical conditions (Psoas Abscess) Understand the preventive and curative health care measures Map Root of mesentery on SP/Model Practice the principles of Bioethics Apply Strategic use of AI in health care Read relevant research articles 	C2 C2 C2 C3 C3 C3 C3 C3 C3	Skill labs	OSPE MCQ SAQ VIVA
Posterior abdominal wall II (Nerves)	<ul style="list-style-type: none"> Trace the nerves present on posterior abdominal wall Discuss the formation of nerves Discuss the formation of lumbosacral plexus Correlate the clinical conditions (Lumbar symphatectomy) Understand the preventive and curative health care measures Practice the principles of Bioethics Apply Strategic use of AI in health care Read relevant research articles 	C2 C2 C2 C2 C3 C3 C3 C3 C3 C3	Skill lab	OSPE MCQ SAQ VIVA
Posterior abdominal wall III (vessels)	<ul style="list-style-type: none"> Enlist branches of Abdominal Aorta. Describe the tributaries of inferior vena cava. Describe lymph nodes of posterior abdominal wall with emphasis on lumbar and intestinal trunk. 	C1 C2 C2 C2	Skill lab	OSPE MCQ SAQ

& Lumbar Vertebrae	<ul style="list-style-type: none"> • Differentiate between typical and atypical lumbar vertebrae. • Identify different parts of lumbar vertebrae. • Discuss the attachments of lumbar vertebrae. • Correlate the clinical conditions (abdominal aortic aneurysm) • Understand the preventive and curative health care measures • Map Abdominal aorta, Inferior Vena cava & Portal vein on simulated patient (SP)/Model • Practice the principles of Bioethics • Apply Strategic use of AI in health care • Read relevant research articles 	C2 C2 C3 C3 C3 P C3 C3 C3 C3		VIVA
Kidney	<ul style="list-style-type: none"> • Discuss the site and extent of kidneys • Differentiate right from left kidney • Understand the bio-physiological aspects of kidney • Discuss the renal capsule and its role in support of kidney. • Describe the structure of cortex and medulla • Describe peritoneal relationship of both kidneys. • Describe visceral relationship of both kidneys • Explain blood supply of both kidneys with emphasis on renal artery. • Discuss the venous drainage of both kidneys. • Correlate the clinical conditions (perinephric abscess, nephroptosis, renal cysts and renal colic) • Understand the preventive and curative health care measures • Map the kidney on the back (Morrison's Parrallelogram) on SP/Model • Practice the principles of Bioethics • Apply Strategic use of AI in health care • Read relevant research articles 	C2 C2 C2 C2 C2 C2 C2 C2 C2 C2 C3 C3 C3 C3 C3 C3	Skill lab	OSPE MCQ SAQ VIVA
	<ul style="list-style-type: none"> • Discuss extent and course of ureter in abdomen and pelvis in males and females • Explain peritoneal reflections of ureter in both sexes. • Describe relations of ureter. 	C2 C2		

Ureter	<ul style="list-style-type: none"> Describe the arterial, venous and lymphatic drainage of ureter. Correlate the clinical conditions (ureteric colic) Understand the preventive and curative health care measures Map Ureter from the back on SP/Model Practice the principles of Bioethics Apply Strategic use of AI in health care Read relevant research articles 	C2 C2 C3 C3 C3 P C3 C3 C3	Skill lab	OSPE MCQ SAQ VIVA
Supra renal gland	<ul style="list-style-type: none"> Describe the location & visceral relations of right and left supra renal glands Understand the bio-physiological aspects of kidney Discuss supra renal cortex and medulla Discuss vessels and nerves of supra renal gland 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 articles 	C2 C2 C2 C2 C3 C3 C3 C3 C3	Skill lab	OSPE MCQ SAQ VIVA
Urinary bladder	<ul style="list-style-type: none"> Interpret size and extent of urinary bladder in different ages and states. Discuss the peritoneal and visceral relationships of urinary bladder(bladder bed) Understand the bio-physiological aspects of kidney Discuss the trigone of urinary bladder Elaborate nerve supply of urinary bladder Correlate the clinical conditions (urinary incontinence, suprapubiccystotomy and atonic bladder) 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 C2 C3 C3 C3 C3 C3	Skill lab	OSPE MCQ SAQ VIVA

Urethra	<ul style="list-style-type: none"> Describe different parts of male and female urethra. Explain blood supply, innervation and lymphatics of urethra in both sexes Discuss the clinically significant differences between male and female urethra 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 articles 	C2 C2 C2 C3 C3 C3 C3	Skill lab	OSPE MCQ SAQ VIVA
Cross Sectional Anatomy	<ul style="list-style-type: none"> Identify different structures at different levels of vertebral column;L2,L3,L4,L5 Correlate the clinical conditions at the given level Understand the preventive and curative health care measures Practice the principles of Bioethics Apply Strategic use of AI in health care Read relevant research articles 	C2 C3 C3 C3 C3 C3	Skill lab	OSPE MCQ SAQ VIVA
Radiology	<ul style="list-style-type: none"> Identify structures on a normal X-ray abdomen Identify kidney and its associated structures on contrast studies. Appreciate filling defects. Mark anatomical landmarks. 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 articles 	C2 C2 C2 P P C3 C3 C3 C3 C3	Skill lab	OSPE MCQ SAQ VIVA

Topics	Learning Objectives Students Should Be Able To	Learning Resources
Posterior abdominal wall I (Fascia & Muscles)	<ul style="list-style-type: none"> Describe the the fascia of posterior abdominal wall Tabulate the muscles of posterior abdominal wall with reference to, origen, insertion, nerve supply and action, Describe the relations of Psoas major muscle. Discuss Psoas abscess Read a relevant research article Use digital Library 	<ul style="list-style-type: none"> ❖ Clinical Oriented Anatomy by Keith L. Moore.8THEdition. (Chapter 5, Page 537- 541). ❖ https://www.youtube.com/watch?v=5ZnlcZrC-XY
Posterior abdominal wall II (Nerves)	<ul style="list-style-type: none"> Trace the nerves present on posterior abdominal wall Discuss the formation of nerves Discuss the formation of lumbosacral plexus Discuss clinical significance of Lumbar symphathectomy Read a relevant research article 	<ul style="list-style-type: none"> ❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 527-532). ❖ https://www.youtube.com/watch?v=5ZnlcZrC-XY
Posterior abdominal wall III (vessels) & Lumbar Vertebrae	<ul style="list-style-type: none"> Enlist branches of Abdominal Aorta. Describe the tributaries of inferior vena cava. Describe lymph nodes of posterior abdominal wall with emphasis on lumbar and intestinal trunk. Differentiate between typical and atypical lumbar vertebrae. Identify different parts of lumbar vertebrae. Discuss the attachments of lumbar vertebrae. Discuss abdominal aortic aneurysm 	<ul style="list-style-type: none"> ❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 541-544, 544-547). ❖ https://www.youtube.com/watch?v=pSDYIPzNg4s
Kidney	<ul style="list-style-type: none"> Discuss the site and extent of kidneys Differentiate right from left kidney Understand the bio-physiological aspects of kidney Discuss the renal capsule and its role in support of kidney. Describe the structure of cortex and medulla Describe peritoneal relationship of both kidneys. Describe visceral relationship of both kidneys Explain blood supply of both kidneys with emphasis on renal artery. Discuss the venous drainage of both kidneys. Discuss related clinicals; perinephric abscess, nephroptosis, renal 	<ul style="list-style-type: none"> ❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 515-517,523-524). ❖ https://www.youtube.com/watch?v=ZVIVquVYGDo

	cysts and renal colic	
Ureter	<ul style="list-style-type: none"> • Discuss extent and course of ureter in abdomen and pelvis in males and females • Explain peritoneal reflections of ureter in both sexes. • Describe relations of ureter. • Describe the arterial, venous and lymphatic drainage of ureter. • Discuss the related clinicals; ureteric colic • Read a relevant research article 	<ul style="list-style-type: none"> ❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 517-518,525). ❖ https://www.youtube.com/watch?v=1P0utMb5nkg
Supra renal gland	<ul style="list-style-type: none"> • Describe the location & visceral relations of right and left supra renal glands • Understand the bio-physiological aspects of kidney • Discuss supra renal cortex and medulla • Discuss vessels and nerves of supra renal gland • Discuss the related clinicals • Read a relevant research article 	<ul style="list-style-type: none"> ❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 519-523). ❖ https://www.youtube.com/watch?v=iE8nCvLaGM4
Urinary bladder	<ul style="list-style-type: none"> • Interpret size and extent of urinary bladder in different ages and states. • Discuss the peritoneal and visceral relationships of urinary bladder(bladder bed) • Understand the bio-physiological aspects of kidney • Discuss the trigone of urinary bladder • Elaborate nerve supply of urinary bladder • Discuss the related clinicals; urinary incontinence, suprapubiccystotomy and atonic bladder 	<ul style="list-style-type: none"> ❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 6, Page 591-595). ❖ https://www.youtube.com/watch?v=tGouMldaQgU
Urethra	<ul style="list-style-type: none"> • Describe different parts of male and female urethra. • Explain blood supply, innervation and lymphatics of urethra in both sexes • Discuss the clinically significant differences between male and female urethra • Read a relevant research article 	<ul style="list-style-type: none"> ❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 6, Page 595). ❖ https://www.youtube.com/watch?v=EUdo392wg0

Practicals				
Topic	At the End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
kidney	<ul style="list-style-type: none"> Identify the histological slide of kidney. Illustrate the histological structure of Kidney. Enlist two points of identification. Focus the slide 	P C2 C1 P	Skill Lab	OSPE
Ureter	<ul style="list-style-type: none"> Identify the histological slide of ureter Illustrate the histological structure of ureter. Enlist two points of identification. Focus the slide 	P C2 C1 P	Skill Lab	OSPE
Urinary bladder	<ul style="list-style-type: none"> Identify the histological slide of urinary bladder. Illustrate the histological structure of urinary bladder Enlist two points of identification. Focus the slide 	P C2 C1 P	Skill Lab	OSPE

Physiology				
Theory				
Topic	Learning Objectives At The End Of Lecture Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Body fluid compartments, Volume & osmolarity of ECF & ICF.	<ul style="list-style-type: none"> Fluid Intake/Output balance Body fluid compartments Constituents of ECF & ICF Concept of Osmolarity, Osmolality, Osmosis and Osmotic pressure 	C1	LGIS	SAQ MCQ VIVA
		C2		
		C2		
		C1		
Physiology of Renal system, Glomerular filtration rate	<ul style="list-style-type: none"> Functions of kidney. Physiologic Anatomy of Kidney Concept of Glomerular Filtration Introduction to Glomerular filtration rate. 	C2	LGIS SGD	SAQ MCQ VIVA
		C2		
		C2		
		C1		
		C1		
Abnormalities of fluid volume & regulation, Edema	<ul style="list-style-type: none"> Volume and osmolarity in abnormal states Abnormalities of fluid volume & Regulation Hyponatremia and Hypernatremia Edema and its Mechanism. Fluid in potential spaces of the body 	C1	LGIS SGD	SAQ MCQ VIVA
		C1		
		C2		
		C1		
		C2		
A. Regulation of GFR & RBF-I (Determinants of GFR & RBF) Regulation of GFR & RBF-II, Physiological control of GFR and	<ul style="list-style-type: none"> Glomerular filtration rate & Renal Blood flow Determinants of GFR 	C1	LGIS SGD	SAQ MCQ VIVA
		C1		
		C2		

RBF, Auto regulation of GFR and RBF/Macula densa feedback mechanism	<ul style="list-style-type: none"> • Determinants of RBF • Physiological control of GFR and RBF. • Auto regulation of GFR and RBF. • Tubulo-glomerular Feedback Mechanism • Macula-densa Feedback Mechanism 	C1	LGIS SGD	SAQ MCQ VIVA
		C1		
		C2		
		C1		
		C2		
		C3		
Tubular reabsorption & secretion along various parts of nephrons	<ul style="list-style-type: none"> • Tubular reabsorption & secretion in <ul style="list-style-type: none"> ○ Proximal tubule ○ Loop of Henle ○ Distal tubule & collecting tubule. Active and passive transport mechanisms 	C1	LGIS Group presentations	SAQ MCQ VIVA
		C2		
		C1		
		C1		
		C2		
Regulation of tubular reabsorption	<ul style="list-style-type: none"> • Concept of Glomerulo tubular Balance • Peritubular capillary and Renal interstitial fluid Physical forces. • Mechanism of Pressure natriuresis and Pressure diuresis 	C1	LGIS SGD Group presentations	SAQ MCQ VIVA
		C2		
A. Clearance methods to quantify kidney function Micturition reflex & Abnormalities of micturition	<ul style="list-style-type: none"> • Clearance Methods (Inulin clearance, Creatinine clearance, Para ammino hipuric acid clearance) • Filtration Fraction • Anatomy of bladder • Micturition and urine formation. • Control of Micturition and Micturition Reflex • Abnormalities of Micturition Reflex 	C1	LGIS SGD	SAQ MCQ VIVA
		C1		
		C1		
		C1		
		C1		
		C2		

Topic	Learning Objectives Students Should Be Able To	LearningDomain	Teaching Strategy	Assessment Tools
GFR & RBF	• Explain factors effecting GFR	C2	SGD	MCQ SEQ VIVA OSPE
	• Discuss determinants of RBF	C2		
	• Explain autoregulatory mechanism of GFR & RBF	C2		
Micturition	• Describe the physiological anatomy & nervous connections of urinarybladder	C1	SGD	MCQ SEQ VIVA OSPE
	• Explain Micturition reflex	C2		
	• Discuss abnormalities of Micturition	C2		
Clearancemethods	• Define Renal clearance	C1	SGD	MCQ SEQ VIVA OSPE
	• Enumerate & Explain clearance methods to quantify renal functions	C1		
	• Explain filtration fraction	C2		
Acid basebalance	• Describe mechanism of action of buffer systems of body fluid	C1	SGD	MCQ SEQ VIVA OSPE
	• Discuss buffering power of respiratory & renal system	C2		
	• Explain the acid base disorders	C2		

Topics Of SDL	Learning Objective	References
Body fluid compartments, Volume & osmolarity of ECF & ICF.	<ul style="list-style-type: none"> • Fluid Intake/Output balance • Body fluid compartments • Constituents of ECF & ICF • Concept of Osmolarity, Osmolality, Osmosis and Osmotic pressure 	<ul style="list-style-type: none"> ❖ Ganong's Review of Medical Physiology.25TH Edition. Regulation of ECF composition andvolume Section 07 (Chapter 38, Page 695) ❖ Physiology by Linda S. Costanzo 6th Edition.Renal Physiology (Chapter 06. Page 245) ❖ Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 04. Physiologyof Body Fluids. (Chapter 26,Page 449-459) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. The Body Fluids And Kidneys.Section 05. (Chapter 25, Page 305-313)
Physiology of Renal system, Glomerular filtration rate	<ul style="list-style-type: none"> • Functions of kidney. • Physiologic Anatomy of Kidney • Concept of Glomerular Filtration • Introduction to Glomerular filtration rate. 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition. Renal Physiology (Chapter 37, Page 671) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Kidneys (Chapter 19 Page 624-636) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 04. Physiologyof Body Fluids. (Chapter 27, Page 460-469) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. The Body Fluids And Kidneys. Section 05. (Chapter 26, Page 321-324) (Chapter 27, Page 331-332)

Abnormalities of fluid volume & regulation, Edema	<ul style="list-style-type: none"> • Volume and osmolarity in abnormal states • Abnormalities of fluid volume & Regulation • Hyponatremia and Hypernatremia • Edema and its Mechanism. • Fluid in potential spaces of the body 	<ul style="list-style-type: none"> • Physiology by Linda S. Costanzo 6th Edition. Renal Physiology (Chapter 06. Page 251) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Kidneys (Chapter 20 Page 672-677) • Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Section 04. Regulation of Volume and Osmolality of the Body Fluids. (Chapter 32, Page 530) • Textbook of Medical Physiology by Guyton & Hall. 14th Edition. The Body Fluids And Kidneys. Section 05. (Chapter 25, Page 314-320)
B. Regulation of GFR & RBF-I (Determinants of GFR & RBF) C. Regulation of GFR & RBF-II, Physiological control of GFR and	<ul style="list-style-type: none"> • Glomerular filtration rate & Renal Blood flow • Determinants of GFR 	<div style="text-align: center;">❖ A.</div> <ul style="list-style-type: none"> ❖ Ganong's Review of Medical Physiology. 25TH Edition. Regulation of ECF composition and volume, Section 07 (Chapter 37, Page 674) ❖ Physiology by Linda S. Costanzo 6th Edition. Renal Physiology (Chapter 06. Page 257,261)
RBF, Auto regulation of GFR and RBF/Macula densa feedback mechanism	<ul style="list-style-type: none"> • Determinants of RBF • Physiological control of GFR and RBF. • Auto regulation of GFR and RBF. • Tubulo-glomerular Feedback Mechanism • Macula-densa Feedback Mechanism 	<ul style="list-style-type: none"> ❖ Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Section 04. Physiology of Body Fluids. (Chapter 28, Page 473) ❖ Textbook of Medical Physiology by Guyton & Hall. 14th Edition. The Body Fluids And Kidneys. Section 05. (Chapter 27, Page 331,333,337) <div style="text-align: center;">❖ B.</div> <ul style="list-style-type: none"> ❖ Textbook of Medical Physiology by Guyton & Hall. 14th Edition. The Body Fluids And Kidneys. Section 05. (Chapter 27, Page 337,342) ❖ Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Section 04. Filtration and Blood Flow. (Chapter 28, Page 476,483) <div style="text-align: center;">□</div>
Tubular reabsorption & secretion along various parts of nephrons	<ul style="list-style-type: none"> • Tubular reabsorption & secretion in • Proximal tubule • Loop of Henle • Distal tubule & collecting tubule. • Active and passive transport mechanisms 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology. 25TH Edition. Regulation of ECF composition and volume Section 07 (Chapter 37, Page 679) • Physiology by Linda S. Costanzo 6th Edition. Renal Physiology (Chapter 06. Page 267) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Kidneys (Chapter 19 Page 636,643) • Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Section 04. Physiology of Body Fluids. (Chapter 29, Page 487-497) . (Chapter 30, Page 498) . (Chapter 31, Page 508) ❖ Textbook of Medical Physiology by Guyton & Hall. 14th Edition. The Body Fluids And Kidneys. Section 05. (Chapter 28, Page 343,355)

Regulation of tubular reabsorption	<ul style="list-style-type: none"> • Concept of Glomerulo tubular Balance • Peritubular capillary and Renal interstitial fluid Physical forces. • Mechanism of Pressure natriuresis and Pressure diuresis 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition. Regulation of ECF composition and volume Section 07 (Chapter 39, Page 709) • Physiology by Linda S. Costanzo 6th Edition. Renal Physiology (Chapter 06. Page 276,298) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. The Body Fluids And Kidneys. Section 05. (Chapter 28, Page 355-360)
<p>B. Clearance methods to quantify kidney function</p> <p>C. Micturition reflex & Abnormalities of micturition</p>	<ul style="list-style-type: none"> • Clearance Methods (Inulin clearance, Creatinine clearance, Para ammino hipuric acid clearance) • Filtration Fraction • Anatomy of bladder • Micturition and urine formation. • Control of Micturition and Micturition Reflex • Abnormalities of Micturition Reflex 	<ul style="list-style-type: none"> ❖ A. ❖ Physiology by Linda S. Costanzo 6th Edition.Renal Physiology (Chapter 06. Page 255) ❖ Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Kidneys (Chapter 19,Page 643- 647) ❖ Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 04. (Chapter 27, Page 469,483) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. The Body Fluids And Kidneys. Section 05. (Chapter 28, Page 360-364) ❖ B. ❖ Ganong's Review of Medical Physiology.25TH Edition. Regulation of ECF composition and volume Section 07 (Chapter 37, Page 691) ❖ Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Kidneys (Chapter 19,Page 648) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. The Body Fluids And Kidneys. Section 05. (Chapter 26, Page 324-328)

Practicals				
Practical	At the End of This Skill Lab, Student Should Be Able to Illustrate:	Learning Domain	Teaching Strategy	Assessment Tools
Specific gravity of Urine	• Apparatus identification	C1	Skill lab	OSPE
	• Principle	C1		
	• Procedure	P, A		
	• Precautions	C1		
	• Use of urinometer	C1		
	• Recall normal values of specific gravity	C1		

Biochemistry				
Theory				
Topic	Learning Objectives At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Introduction to protein metabolism	Understand protein turn-over, amino acid pool and entry of amino acid into cell	C2	LGIS	MCQs, SAQs & Viva
Nitrogen balance	Describe positive and negative nitrogen balance	C2	LGIS	MCQs, SAQs & Viva
General reactions of amino acids	Discuss reactions of amino acids	C2	LGIS	MCQs, SAQs & Viva
	Interpret the clinical importance of transaminases	C3		
Metabolism of ammonia	Explain sources of NH ₃ formation and its transport	C2	LGIS	MCQs, SAQs & Viva
	Discuss causes and effects of Hyperammonemia	C3		
	Explain mechanism of ammonia toxicity	C2		
Urea cycle	Describe the location, steps and regulation of Urea cycle	C2	LGIS	MCQs, SAQs & Viva
Disorders of urea cycle	Describe Disorders of the urea cycle	C2	LGIS	MCQs, SAQs & Viva
Metabolism of glycine	Explain Glycine metabolism and related disease	C2	LGIS	MCQs, SAQs & Viva
Metabolism of phenyl alanine and tyrosine	Explain Phenyl alanine & tyrosine metabolism	C2	LGIS	MCQs, SAQs & Viva
	Discuss related inherited disorders	C3		

Metabolism of Tryptophan	Explain Tryptophan metabolism Discuss related inherited disorders	C2 C3	LGIS	MCQs, SAQs & Viva
Metabolism of methionine	Describe metabolism of sulphur containing amino acids Discuss related disorders	C2 C3	LGIS	MCQs, SAQs & Viva
Metabolism of branched chain amino acids	Explain Metabolism of branched chain amino acids Discuss related inherited disorders	C2 C3	LGIS	MCQs, SAQs & Viva
Metabolism of polyamines	Discuss Synthesis of polyamines and their clinical significance	C2	LGIS	MCQs, SAQs & Viva
Acid base imbalance	Explain causes and compensation of metabolic and respiratory acid base disorders Describe anion gap and its significance Interpret different acid base disorders	C2 C2 C3	LGIS	MCQs, SAQs & Viva
Water	Explain Distribution of water in different compartments of body Interpret Dehydration & over hydration	C2 C3	LGIS	MCQs, SAQs & Viva
Electrolytes Sodium (Na)	Describe Daily requirements, sources and functions of sodium Explain causes and effects of hyponatremia & hypernatremia	C2 C3	LGIS	MCQs, SAQs & Viva
Potassium	Describe Daily requirements, sources and functions of potassium Explain causes and effects of hypokalemia & hyperkalemia	C2 C3	LGIS	MCQs, SAQs & Viva
Chloride (Cl) & Bicarbonate (HCO ₃)	Describe Daily requirements, sources, functions & their deficiency and toxic effects on body	C2	LGIS	MCQs, SAQs & Viva

Topic	Learning Objectives At The End Of Tutorial Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Phenylalanine Metabolism	Explain Metabolism of phenylalanine Metabolism	C2	SGD	MCQs, SAQs & Viva
Metabolism of tryptophan, tyrosine and branched chain amino acids	Explain metabolism and related disorders of amino acids	C2	SGD	MCQs, SAQs & Viva
Hyper Amonia	Explain formation, transport and toxicity of ammonia in the body	C2	SGD	MCQs, SAQs & Viva
Acid base imbalance	Explain causes and compensation of acid base disorders	C2	SGD	MCQs, SAQs & Viva
Sodium & Chloride Metabolism	Describe causes and effects of hypo and hyper natremia, hypo and hyper kalemia	C2	SGD	MCQs, SAQs & Viva

Topics Of SDL	Learning Objectives	Learning resources
Amino Acids Pool, Protein Turnover, Nitrogen balance & Transport of Amino Acids	<ul style="list-style-type: none"> Understand protein turn-over, amino acid pool and entry of amino acid into cell Describe positive and negative nitrogen balance 	<ul style="list-style-type: none"> Lippin cott Biochemistry 8th edition (chapter 19 page - 271) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3854183/
Urea cycle & its Disorders	<ul style="list-style-type: none"> Describe the location, steps and regulation of Urea cycle Describe Disorders of the urea cycle 	<ul style="list-style-type: none"> Lippin cott Biochemistry 8th edition (chapter 19 page - 279) https://my.clevelandclinic.org/health/diseases/23470-urea-cycle-disorder
Arginine & Branched Chain Amino Acid Metabolism, Ammonia Toxicity	<ul style="list-style-type: none"> Explain Metabolism of branched chain amino acids Discuss related inherited disorders 	<ul style="list-style-type: none"> Harper's illustrated biochemistry 32nd edition (Chapter 40 page 477) https://link.springer.com/article/10.1007/BF00998474
Sodium & Chloride Metabolism	<ul style="list-style-type: none"> Describe Daily requirements, sources and functions of sodium Explain causes and effects of hyponatremia & hypernatremia Describe Daily requirements, sources, functions & their deficiency and toxic effects on body 	<ul style="list-style-type: none"> Essentials of medical Biochemistry. Mushtaq Ahmad Vol – I 9th edition (Chapter 02 page 46) https://www.sciencedirect.com/topics/medicine-and-dentistry/sodium-metabolism

Practicals				
Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Urine analysis I	Examine urine for its color, odor, pH and specific gravity Perform tests on urine to detect its normal constituents	P	Skill Lab	OSPE
Urine analysis II	Perform tests to detect abnormal constituents of urine (proteins, ketone bodies, bile salts)	P	Skill Lab	OSPE
Estimation of urea	Perform estimation of urea	P	Skill Lab	OSPE
Estimation of creatinine	Perform estimation of creatinine	P	Skill Lab	OSPE

Basic and Clinical Sciences (Vertical Integration)

Anatomy, Physiology Biochemistry			
Theory			
Subject	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain
Anatomy	• Renal Failure	Apply basic knowledge of subject to study clinical case.	C3
	• Ureteric Colic	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• Acute Glomerulo Nephritis	Apply basic knowledge of subject to study clinical case.	C3
	• Anuria	Apply basic knowledge of subject to study clinical case.	C3
Biochemistry	• Metabolic Acidosis	Apply basic knowledge of subject to study clinical case.	C3
	• Ammonia Toxicity	Apply basic knowledge of subject to study clinical case.	C3
Subject	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain
PBL	• Renal Failure	Apply basic knowledge of subject to study clinical case.	C3

Surgery				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Investigations of urinary tract	• Understand the diagnostic approach and interpretation of urinary tract investigations including urinalysis, urine culture, ultrasonography, and intravenous urography.	C2	LGIS	MCQs
	• Demonstrate proficiency in recognizing common urinary tract disorders through investigative findings, facilitating accurate diagnosis and management decisions.	C2		

Hydronephrosis / Pyonephrosis	• Define hydronephrosis and pyonephrosis, including their etiology and pathophysiology.	C2	LGIS	MCQs
	• Identify clinical presentations, diagnostic modalities, and management strategies for both conditions, emphasizing the importance of early recognition and intervention to prevent renal damage.	C2		

Medicine				
Theory				
Topic	At The End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Acute renal failure	• Understand the etiology, pathophysiology, and clinical manifestations of ARF	C2	LGIS	MCQs
	• Recognizing the diagnostic criteria and appropriate investigations for ARF	C2	LGIS	MCQs
CRF & Rehabilitation of patient with CRF	• Understand the etiology, pathophysiology, clinical manifestations, and management options of CRF.	C2	LGIS	MCQs
	• Recognize the importance of rehabilitation strategies such as dietary modifications, medication management, dialysis, and transplantation in improving patient outcomes and quality of life.	C2	LGIS	MCQs
Potassium imbalance and its management	• Understand the physiological role of potassium in the body and recognize the clinical manifestations of hypo- and hyperkalemia.	C2	LGIS	MCQs
	• Develop competence in diagnosing and managing potassium imbalances, including appropriate treatment modalities and monitoring strategies.	C2	LGIS	MCQs

Community Medicine				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Biostatistics-1 Basic concepts and uses (Descriptive). Data and its types.	<ul style="list-style-type: none"> Define biostatistics and correlate its importance in medical research. 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Understand data and its types 	C2		
Biostatistics-2 Basic concepts and uses (Descriptive). Data and its types.	<ul style="list-style-type: none"> Define biostatistics and correlate its importance in medical research. 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Understand data and its types 	C2		

Obstetrics & Gynaecology				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Physiological changes in the renal system in pregnancy	<ul style="list-style-type: none"> The anatomic and functional changes in the renal system in pregnancy 	C2	LGIS	MCQs
	<ul style="list-style-type: none"> The changes in indices of renal function during pregnancy 	C2		

Pharmacology				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Introduction to diuretics	<ul style="list-style-type: none"> Understanding the mechanism of action of diuretics in altering renal function to promote urine production. 	C2	LGIS	MCQs
	<ul style="list-style-type: none"> Identifying the major classes of diuretics, their pharmacokinetics, clinical indications, and potential side effects. 	C2		

	<ul style="list-style-type: none"> Exploring the role of diuretics in managing conditions such as hypertension, edema, and congestive heart failure 	C2		
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List of Renal Module Vertical Courses Lectures						
Sr. #	Date/Day	Week	Department	Time	Topic Of Lectures	Teachers Name & Contact #
1.	06-05-2024 MONDAY	3 rd	Surgery	10:30 am – 11:20 am	Investigations of urinary tract	Dr. Faraz Basharat
						Dr. Muhammad Amin
2.	06-05-2024 MONDAY	3 rd	Medicine	11:20 am – 12:10 Pm	Acute renal failure	Dr. Saima Meer 0343-5761430
						Dr. Mudassir
3.	07-05-2024 TUESDAY	3 rd	Medicine	11:20- 12:10pm	CRF & Rehabilitation of patient with CRF	Dr. Mudassar 0321-6813249
						Dr. Saima Meer 0343-5761430
4.	08-05-2024 WEDNESDAY	3 rd	Surgery	10:30 am – 11:20 am	Hydronephrosis / Pyonephrosis	Dr. Muhammad Ali
						Dr. Ahmed Shahzad
5.	08-05-2024 WEDNESDAY	3 rd	Obstetrics & Gynecology	11:20 am – 12:10 pm	Common renal problems in pregnancy (lower and upper urinary tract infections, hydronephrosis, stress incontinence)	Dr. Humaira Noreen
						Dr. Talat Farkhanda
6.	13-05-2024 MONDAY	4 th	Medicine	11:20 am - 12:10 pm	Potassium imbalance and its management	Dr. Mudassar 0321-6813249
						Dr. Saima Meer 0343-5761430
7.	15-05-2024 WEDNESDAY	4 th	Pharmacology	11:20 am – 10:10 Am	Introduction to diuretics	Dr. Uzma 0336-5178766 (Even)
						Dr. Haseeba 0331-4453835 (Odd)

Spirally Integrated Courses / General Education Cluster (GEC) Courses

Content

- **Longitudinal Themes**
 - **The Holy Quran Translation**
 - **Biomedical Ethics & Professionalism**
 - **Family Medicine**
 - **Artificial Intelligence (AI) and Innovation**
 - **Integrated Undergraduate Research Curriculum (IUGRC)**
 - **Entrepreneurship**
 - **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	<ul style="list-style-type: none"> Describe the answers to questions of the Pagans of Arab Describe the purpose of sending the Prophets. 	C2	LGIS	SAQ
Ibadat	<ul style="list-style-type: none"> Understand the concept of Hijrah in Holy Quran Discuss the significance of consistency in religion 	C2	LGIS	SAQ

Radiology & Artificial Intelligence				
Theory				
Topic	At The End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Prenatal Ultrasonography	<ul style="list-style-type: none"> Interpret normal ultrasonography of renal system 	C2	LGIS	MCQs
	<ul style="list-style-type: none"> Discuss features of different congenital abnormalities of renal system 	C2		
Contrast Nephropathy	<ul style="list-style-type: none"> Understand the diverse manifestations of nephropathy, including diabetic nephropathy and IgA nephropathy 	C2	LGIS	MCQs

Biomedical Ethics and Professionalism				
Theory				
Topic	At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Islam & Teachings of Bioethics	<ul style="list-style-type: none"> 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	LGIS	MCQs

Ethics of social media & advertising	<ul style="list-style-type: none"> • Delineate the principles of ethics involved in social media & advertising including. • Publishing or broadcasting information • Certificates, Reports and other documents • Teaching Photography and Consent 			
Ethical principles	<ul style="list-style-type: none"> • Elaborate General ethical 06 basic ethical principles: autonomy, beneficence, non-maleficence & justice. • Explain the process of ensuring patient autonomy, beneficence, non-maleficence, respect & justice while informing/ deciding on a treatment modality 			

Integrated Undergraduate Research Curriculum (IUGRC)				
Theory				
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
How to Generate a Research Question	• How to generate a research question according to FINER Criteria	C3	Hands on Session	MCQs
	• Formulate the research question according to PICOT format – problem/population, intervention, comparison, outcome and time frame			
	• To understand how a properly formulated research question is related to an efficient literature review			
	• Development of research protocol including research objectives			
Session on Data Analysis	<ul style="list-style-type: none"> • Understand statistical methods applicable to medical data. • Mastertools for data visualization and interpretation. • Develop skills to critically evaluate research findings for their clinical significance and validity. 	C3	Hands on Session	MCQs
Manuscript Writing	<ul style="list-style-type: none"> • Structure their manuscripts coherently. • Employ appropriate scientific language, and adhere to journal guidelines, thereby enhancing their ability to communicate research findings effectively in scholarly publications. 	C3	Hands on Session	MCQs

Family Medicine				
Theory				
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Renal Failure	• Describe presenting complains of patients with Renal failure	C3	LGIS-1	MCQs
	• Disscus complications of Renal failure			
	• Descirbe intial treatment of patients with Renal failure			
	• Know when to refer patient to consultant/ Hospital			

Entrepreneurship				
Theory				
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Ideate Initial Idea	• Identify healthcare challenges and develop innovative solutions.	C2	LGIS	MCQs
	• Understand the healthcare market landscape to identify opportunities and assess demand.	C2		
	• Describe the ethical implications of healthcare entrepreneurship, including patient privacy and safety.	C2		

List of Renal Module Spiral Courses Lectures						
Sr. #	Date/Day	Week	Department	Time	Topic Of Lectures	Teachers Name & Contact #
1.	29-04-2024 MONDAY	2 nd	Bioethics	10:30 am – 11:20 am	Ethical principles	Dr. Arsalan (0334-3911629)
2.	30-04-2024 TUESDAY	2 nd	Research Practical Session II	10:30 am – 11:20 am	Questionnaire Development	Dr. Khuala Noreen
						Dr. Afifa Kalsoom
3.	03-05-2024 FRIDAY	2 nd	Quran Translation – I	09:20 am – 10:10 am	Imaniat-3	Mufti Naeem Sherazi 0300-5580299 (Even)
					Ibadaat-3	Dr. Fahd Anwar 0300-5156800 (Odd)
4.	07-05-2024 TUESDAY	3 rd	Research Practical Session III	10:30am-11:20 am	Session on data analysis	Dr. Khuala Noreen
						Dr. Afifa Kalsoom
5.	10-05-2024 FRIDAY	3 rd	Quran Translation – II	08:00 am – 09:00 am	Ibadaat-4	Mufti Naeem Sherazi 03005580299 (Even)
					Imaniat-4	Dr. Fahd Anwar 03005156800 (Odd)
6.	13-05-2024 MONDAY	4 th	Research Practical Session IV	10:30 am – 11:20 am	Manuscript writing	Dr. Khuala Noreen
						Dr. Afifa Kalsoom
7.	14-05-2024 TUESDAY	4 th	Family Medicine	11:20 am – 12:10 am	Renal Failure	Dr. Sidra Hamid (03315025147)
						Dr. Sadia
						Mufti Naem Sherazi 03005580299 (Even)

Block-II

Module No. 3 - Reproduction

Duration 4 Weeks



Reproduction Module Team

Module Name : Reproduction Module
 Duration of module : 04 Weeks
 Coordinator : Dr. Uzma Zafar
 Co-coordinator : Dr. Romessa Naeem
 Reviewed by : Module Committee

Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Uzma Zafar (APWMO Demonstrator of Biochemistry)
2.	Director DME	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Farzana Fatima
3.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf	3.	Co-coordinator	Dr. Tariq Furqan (Senior Demonstrator of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Romessa Naeem (Senior Demonstrator of Biochemistry)
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5.	Co-coordinator	Dr. Nazia (Senior Demonstrator of Physiology)
6.	Focal Person Anatomy Second Year MBBS	Dr. Maria Tasleem			
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.	DME Implementation Team	Prof. Dr. Ifra Saeed 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			
13.	Focal Person Quran Translation Lectures	Dr. Uzma Zafar			
14.	Focal Person Family Medicine	Dr. Sadia Khan			

Themes				
Block	Subjects	Embryology	Histology	Gross Anatomy
II	<ul style="list-style-type: none"> Anatomy 	Embryology/Development <ul style="list-style-type: none"> Testis Genital Ducts Prostate & Accessory Glands Uterus & Uterine tubes Ovary & Vagina 	Histology <ul style="list-style-type: none"> Testis Genital Ducts Prostate & Accessory Glands Uterus & Uterine Tubes Ovary & Vagina 	<ul style="list-style-type: none"> Sacrum Bony Pelvis & Joints of Pelvis Pelvic Fascia, Pelvic Diaphragm, & Pelvic Peritoneum Male External Genitalia, Scrotum, & Testis Prostate Vas Deferens, Seminal Vesicles & Ejaculatory Ducts Female External Genitalia, Ovaries, Fallopian Tubes Uterus, Cervix & Vagina Ischioanal Fossa Urogenital Diaphragm Perineum, Superficial Perineal Pouch and its contents Deep Perineal Pouch and its contents Blood Supply & Lymphatic Drainage of Pelvis & Perineum Sacral and Coccygeal Plexus Radiology, Surface Marking
	<ul style="list-style-type: none"> Biochemistry 	<ul style="list-style-type: none"> Digestion of nucleic acid & biosynthesis of purines Purine catabolism and related disorders Pyrimidine metabolism Regulation of gene expression Male Gonadal Hormones Female Gonadal Hormones 		
	<ul style="list-style-type: none"> Physiology 	<ul style="list-style-type: none"> Physiological anatomy of male reproductive system & spermatogenesis Physiological anatomy female reproductive system Semen, capacitation & acrosome reaction Monthly Ovarian Cycle, ovulation Male sex hormones, Abnormalities of male sexual function and spermatogenesis Monthly Endometrial Cycle and Menstruation Response of mother's body to pregnancy and parturition Female sex hormones (oestrogen and progesterone) Lactation, Milk composition, breast feeding Puberty, menarche, menopause, postmenopausal symptoms & anovulatory cycles, Abnormalities of 		

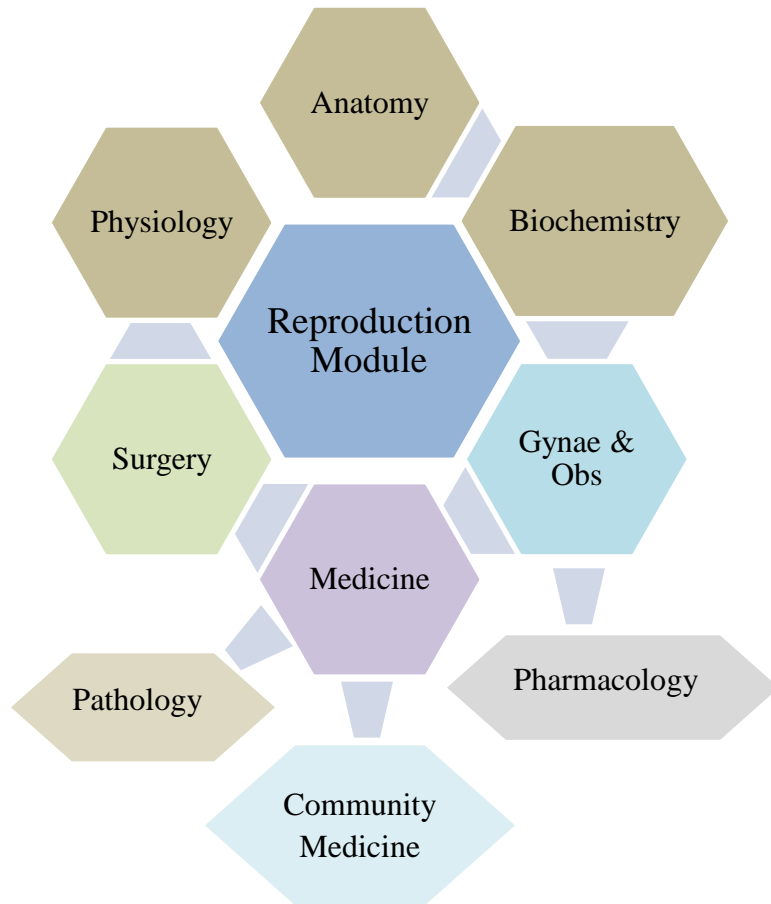
		<ul style="list-style-type: none"> secretion by ovaries Growth & functional development of fetus, Adjustments of infant to extrauterine life, Growth & development in child Fertilization of ovum, transport, implantation, Functions of placenta Hormonal factors in pregnancy, Special functional problems in neonate. Prematurity and its problems
	Spiral Courses	
	<ul style="list-style-type: none"> Biomedical (Club Activity) 	<ul style="list-style-type: none"> Ethical dilemmas Involving breech in Autonomy. Ethical dilemmas in healthcare practice involving breach in principle of beneficence and non-maleficence. Ethical dilemmas practice involving breach in principle of justice
	<ul style="list-style-type: none"> Behavioural Sciences 	<ul style="list-style-type: none"> Emotion
	<ul style="list-style-type: none"> Family Medicine 	<ul style="list-style-type: none"> AIDS
	<ul style="list-style-type: none"> The Holy Quran Translation 	<ul style="list-style-type: none"> Imaniat-5 Akhlaqiat-1
	<ul style="list-style-type: none"> Pak Studies/Islamiyat 	<ul style="list-style-type: none"> Kaamyab logu ki sifaat Nehru report, Quaid e Azam k 14 nukaat
	Vertical Integration	
	<ul style="list-style-type: none"> Gynae & Obs 	<ul style="list-style-type: none"> Early Pregnancy Complications Menstrual irregularities Subfertility
	<ul style="list-style-type: none"> Pharmacology 	<ul style="list-style-type: none"> Hormonal Contraceptives
	<ul style="list-style-type: none"> Surgery 	<ul style="list-style-type: none"> Male hypogonadism, Acute Scrotum
	<ul style="list-style-type: none"> Pathology 	<ul style="list-style-type: none"> BPH/Prostatitis / Sexually Transmitted Diseases Polycystic Ovaries
	<ul style="list-style-type: none"> Community Medicine 	<ul style="list-style-type: none"> Sexually Transmitted Diseases (STDs) Acquired Immunodeficiency Syndromes/ Sexually Transmitted Diseases
	Early Clinical Exposure	
	<ul style="list-style-type: none"> Clinical Rotations 	<div> <div> <ul style="list-style-type: none"> Ovarian Tumors Uterine Tumors Polycystic Ovaries Menstrual Irregularities </div> <div>(Gynecology)</div> </div>
		<ul style="list-style-type: none"> Important points in History of pregnant lady

		<ul style="list-style-type: none">• Obstetrics Trimesters• Fetal heart sounds	(Obstetrics)
		<ul style="list-style-type: none">• Testicular Tumors• Hydrocele• Undescended Testis• Hypospadias/ Epispadias	(Surgery)
Clinical Themes			
	<ul style="list-style-type: none">• Polycystic Ovary Syndrome (PCOS): Diagnosis and Management• Male and Female Infertility: Causes and Treatment Options• Pathophysiology of Menstrual Disorders (e.g., dysmenorrhea, amenorrhea)• Pregnancy-Induced Hypertension (PIH) and Pre-Eclampsia• Ectopic Pregnancy: Diagnosis and Surgical Management• Hormonal Contraception: Mechanisms and Side Effects• Diagnosis and Management of Pelvic Inflammatory Disease (PID)• Benign and Malignant Tumors of the Reproductive System (e.g., ovarian and testicular cancers)• Common Sexually Transmitted Infections (e.g., syphilis, gonorrhea)• Understanding and Counseling in Assisted Reproductive Techniques		

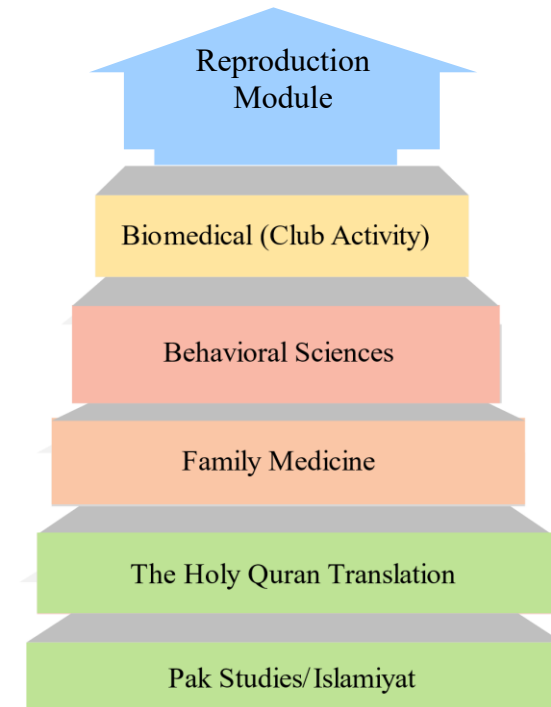
Implementation of Terms of Reference (TORS)

- 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 Reproduction Module



Spiral / General Education Cluster Courses



Module No. 3 – Reproduction

Rationale: Reproductive system plays an important role in person life although it does not contribute to homeostasis and is not essential for the survival of individual e.g. the manner in which people relate as sexual beings contributes in significant ways to psychosocial behavior and has an important influence on how people view themselves and how they interact with others. Reproductive function also has profound effect on society. The universal organization of societies into family units provide a stable environment that is conducive for perpetuating our species.

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 reproductive system.
- Used technology based Medical Education including **Artificial Intelligence**
- Appreciate concept and importance of
 - **Family Medicine**
 - **Biomedical Ethics**
 - **Research**

Skills

- Demonstrate effective skill for performing and interpreting various laboratory tests like pregnancy test.
- Demonstrate awareness of ethical, legal and social implication 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 4 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 Reproduction (Module No. 3)

Anatomy				
Theory				
Topics	At The End Of Lecture Students Should Be Able To:	Learning Domains	Teaching Strategy	Assessment Tools
Development of testis	<ul style="list-style-type: none"> Recall the time of early sex differentiation and genes involved in it. Explain the development of male gonads and formation of testis. Describe the descent of testis. Describe the concepts of chromosomal determination of sex, primordial germ cells and indifferent gonads. Describe histogenesis of interstitial cells of leydig and seminiferous tubules. Correlate with the clinical conditions. Understand curative and preventive health care measures. Practice the principles of bioethics. Apply strategic use of A.I in health care. Read relevant research article. 	C1 C2 C2 C2 C2 C3 C3 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA
Histology of Testis	<ul style="list-style-type: none"> Discuss germ cells at different steps of spermatogenesis in the seminiferous tubule. Describe histology of Sertoli cells and Leydig cells. Explain their roles in the production of sperm and regulation of the male reproductive system. Understand the bio-physiological aspects of spermatogenesis. Discuss the related clinicals like orchitis, male infertility, testicular cancers, cryptorchidism. Correlate with the clinical conditions Understand curative and preventive health care measures. Practice the principles of bioethics. Apply strategic use of A.I in health care. Read relevant research article 	C2 C2 C2 C2 C3 C3 C3 C3 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA

		C3 C3		
Histology of male genital ducts	<ul style="list-style-type: none"> Describe the histological organization of epididymis, ductus deferens and ejaculatory ducts. Describe the epithelium and microscopic features of epididymis, ductus deferens and ejaculatory ducts. Understand the bio-physiological aspects of epithelium of ducts. Discuss the related clinicals like vasectomy, epididymitis. Understand curative and preventive health care measures. Practice the principles of bioethics. Apply strategic use of A.I in health care. Read relevant research article 	C2 C2 C3 C3 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA
Development of male genital ducts, Seminal vesicles and prostate	<ul style="list-style-type: none"> Describe the development of male genital ducts during indifferent stage. Discuss development of male genital ducts at advanced stage Describe the molecular regulation of male genital ducts. Describe the development of seminal vesicles. Discuss the development of prostate. Discuss the remnants of mesonephric and paramesonephric ducts in males and their clinical significance. Understand curative and preventive health care measures. Practice the principles of bioethics. Apply strategic use of A.I in health care. Read relevant research article. 	C2 C2 C2 C2 C2 C3 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA

Histology of accessory male reproductive glands	<ul style="list-style-type: none"> Describe the histological organization of prostate gland, seminal vesicles and bulbourethral glands. Describe microscopic features of these glands. Discuss the related clinicals like prostatitis. Understand curative and preventive health care measures. Practice the principles of bioethics. Apply strategic use of A.I in health care. Read relevant research article. 	C2 C2 C2 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA
Development of male external genitalia	<ul style="list-style-type: none"> Explain the different stages and further development of external genitalia. Discuss the related clinical like ambiguous genitalia, Androgen insensitivity syndrome, hypospadias, epispadias, bifid penis, micropenis Understand curative and preventive health care measures. Practice the principles of bioethics. Apply strategic use of A.I in health care. Read relevant research article. 	C2 C2 C3 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA
Histology of uterus and uterine tubes	<ul style="list-style-type: none"> Recollect knowledge of histological features of endometrium in various phases Discuss microanatomy of layers of uterus Describe parts of uterine tubes Explain microscopic features of all parts of uterine tubes. Discuss the related clinicals like endometriosis, tubal ligation, salpingitis, and cervical cancers Understand curative and preventive health care measures. Practice the principles of bioethics. Apply strategic use of A.I in health care. Read relevant research article. 	C1 C2 C2 C2 C2 C3 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA

Development of uterus and uterine tubes	<ul style="list-style-type: none"> Describe role of paramesonephric ducts, uterovaginal primordium in development of uterine tubes Discuss the role of paramesonephric ducts and uterovaginal primordium in the development of uterus. Discuss the related clinicals like bicornuate uterus, unicornuate uterus, double uterus. Understand curative and preventive health care measures. Practice the principles of bioethics. Apply strategic use of A.I in health care. Read relevant research article 	C2 C2 C2 C3 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA
Histology of Ovary and Vagina	<ul style="list-style-type: none"> Discuss the stages of follicular growth (primordial, primary, secondary, tertiary), as well as the changes that occur in the follicular wall. Discuss ovarian cycle and menstrual cycle. Describe the histological features of corpus luteum of menstruation and pregnancy. Discuss the related clinicals like PCOS, Follicular cyst, hemorrhagic cyst. Discuss histological structure of vagina. Understand the bio-physiological aspects of vaginal epithelial cells. Discuss the related clinical like vaginitis, squamous cell carcinoma of vagina. Understand curative and preventive health care measures. Practice the principles of bioethics. Apply strategic use of A.I in health care. Read relevant research article 	C2 C2 C2 C2 C2 C2 C3 C3 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA

Development of Ovary	<ul style="list-style-type: none"> Recall the process of oogenesis in female. Explain the different steps involved in early oogenesis. Explain the ovarian and menstrual cycle and phases. Explain the hormonal changes occurring during reproductive cycle. Describe role of paramesonephric ducts, uterovaginal primordium in development of ovary Describe the descent of ovaries. Understand curative and preventive health care measures Practice the principles of bioethics. Apply strategic use of A.I in health care Read a relevant research article 	C1 C2 C2 C2 C2 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA
Development of Vagina	<ul style="list-style-type: none"> Discuss the developmental stages of vagina and female external genitalia Enlist different congenital anomalies of female reproductive system. Describe different syndromes and gene defects associated with congenital anomalies Understand curative and preventive health care measures Practice the principles of bioethics. Apply strategic use of A.I in health care Read a relevant research article 	C2 C1 C2 C3 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SAQS VIVA

Topics	At The End Of Demonstration Student Should Be Able To	Learning Domains	Teaching Strategy	Assessment Tools
Sacrum	<ul style="list-style-type: none"> Identify the bone Place the bone in anatomical position Demonstrate anatomical features on bone Discuss attachments and relations on bone Discuss important clinical anatomy of bone Understand curative and preventive health care measures Practice the principles of bioethics. Apply strategic use of A.I in health care 	C2 P P C2 C3 C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> MCQS SAQS OSPE VIVA

	<ul style="list-style-type: none"> • Read a relevant research article 			
Bony pelvis	<ul style="list-style-type: none"> • Identify type of pelvis • Place pelvis in anatomical position • Demonstrate different diameters of each type • Differentiate bony features of each type • Clinical importance of each type • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C2P PC1 C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQS • SAQS • OSPE • VIVA
Pelvic Peritoneum and its contents	<ul style="list-style-type: none"> • Identify viscera present in pelvis • Demonstrate peritoneal reflections on pelvic viscera • Discuss pouches formed by peritoneum • Discuss clinical anatomy of pelvic peritoneum and pelvic viscera • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C2 P C2 C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQS • SAQS • OSPE • VIVA
Pelvic diaphragm	<ul style="list-style-type: none"> • Identify the muscles forming pelvic diaphragm • Demonstrate the attachments and nerve supply of muscles of pelvic diaphragm • Locate the structures piercing the pelvic diaphragm • Discuss clinical anatomy of pelvic diaphragm • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C2 P C2 C2 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQS • SAQS • OSPE • VIVA
Male external genitalia	<ul style="list-style-type: none"> • Identify the anatomical structures of external genitalia • Demonstrate anatomical position of testis • Enlist layers of scrotum with its neurovasculature • Discuss clinical anatomy of scrotum • Understand curative and preventive health care measures 	C2 C1 C3 C3 C3 P C3	Skill Lab	<ul style="list-style-type: none"> • MCQS • SAQS • OSPE

	<ul style="list-style-type: none"> Practice the principles of bioethics. Apply strategic use of A.I in health care Read a relevant research article 	C3		<ul style="list-style-type: none"> VIVA
Testis	<ul style="list-style-type: none"> Identify the structure Demonstrate anatomical position of testis Discuss layers and structure of testis Discuss important clinical anatomy related to testis Understand curative and preventive health care measures Practice the principles of bioethics. Apply strategic use of A.I in health care Read a relevant research article 	C2 C2 C3 C3 C3 C3 C3	P Skill Lab	<ul style="list-style-type: none"> MCQs SAQs OSPE VIVA
Male genital ducts	<ul style="list-style-type: none"> Describe the anatomical position of vas deferens, seminal vesicles, ejaculatory ducts on model Discuss the anatomical relations of vas deferens, seminal vesicles, ejaculatory ducts Discuss clinical anatomy Understand curative and preventive health care measures Practice the principles of bioethics. Apply strategic use of A.I in health care Read a relevant research article 	C2 C2 C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> MCQs SAQs OSPE VIVA
Prostate	<ul style="list-style-type: none"> Identify the position of prostate Demonstrate the anatomical features and relations of prostate Discuss clinical anatomy Understand curative and preventive health care measures Practice the principles of bioethics. Apply strategic use of A.I in health care Read a relevant research article 	C2 P C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> MCQs SAQs OSPE VIVA
Ovaries	<ul style="list-style-type: none"> Identify the site of ovarian fossa Discuss anatomical relations of ovary Discuss neurovasculature and hormonal effects of ovaries Discuss important clinical anatomy of ovary Understand curative and preventive health care measures Practice the principles of bioethics. 	C1 C2 C2 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> MCQs SAQs OSPE VIVA

	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care • Read a relevant research article 	C3		
Fallopian tubes, Uterus	<ul style="list-style-type: none"> • Identify the location of structures in pelvis • Demonstrate anatomical relations of these structures • Discuss normal positions of uterus with its ligaments • Discuss its neurovasculature • Discuss important clinical anatomy of fallopian tubes, uterus and uterine tube • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C1 P C2 C2 C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA
Cervix	<ul style="list-style-type: none"> • Discuss anatomy of cervix • Describe anatomical relations of cervix • Describe its neurovasculature • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C2 C2 C2 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA
Ischio-anal fossa	<ul style="list-style-type: none"> • Discuss the dimensions, boundaries and recesses • Describe the contents of Ischio anal fossa • Describe pudendal canal and its contents • Discuss important clinical anatomy of structures • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C2 C2 C2 C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA
Urogenital diaphragm	<ul style="list-style-type: none"> • Discuss the formation of diaphragm • Identify the relations and contents of diaphragm • Discuss organs piercing urogenital diaphragm • Discuss important clinical anatomy related to diaphragm • Understand curative and preventive health care measures • Practice the principles of bioethics. 	C2 C1 C2 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA

	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care • Read a relevant research article 	C3		
Perineum & Superficial perineal pouches	<ul style="list-style-type: none"> • Identify boundaries and divisions of perineum • Discuss formation of perineal pouches • Discuss in detail the contents of superficial perineal pouches in male and female • Discuss important clinical anatomy related to superficial perineal pouches • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C1 C2 C2 C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA
Deep perineal pouches	<ul style="list-style-type: none"> • Discuss in detail the contents of deep perineal pouches in male and female • Discuss important clinical anatomy related to deep perineal pouches. • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C2 C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA
Blood supply of pelvis and perineum	<ul style="list-style-type: none"> • Identify major blood vessels & nerves of pelvis and perineum • Demonstrate anatomical relationships • Describe important clinical anatomy related to blood vessels of pelvis and perineum • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C1 P C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA
Lymphatic drainage of pelvis and perineum	<ul style="list-style-type: none"> • Identify major lymphatic vessels of pelvis and perineum • Discuss lymphatic drainage of pelvis and perineum • Discuss important clinical anatomy • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care 	C1 C2 C2 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA

	<ul style="list-style-type: none"> • Read a relevant research article 			
Sacral and Coccygeal plexus	<ul style="list-style-type: none"> • Identify various branches of sacral and coccygeal plexus • Discuss anatomical relations • Describe root values of each branch of plexus and its related applied • Understand curative and preventive health care measures • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C1 C2 C2 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA
Radiology	<ul style="list-style-type: none"> ➤ Describe the radiological appearance of pelvis and perineum on ➤ Interpret normal radiographs ➤ Read ultrasound uterus for gestation/foetus ➤ Describe Hysterosalpingigraphy ➤ Understand curative and preventive health care measures ➤ Practice the principles of bioethics. ➤ Apply strategic use of A.I in health care ➤ Read a relevant research article 	C2 C3 C3 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA
Cross Sectional Anatomy	<ul style="list-style-type: none"> • Identify different structures of male pelvis at different levels; S5, coccyx, Symphysis pubis, ischial tuberosity, anal verge • Identify different structures of female pelvis at different levels; S5, coccyx, Symphysis pubis, ischial tuberosity, anal verge • Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article 	C2 C2 C3 C3 C3 C3	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs • OSPE • VIVA

Topics	Learning objectives	Learning Resources
Sacrum	<ul style="list-style-type: none"> • Identify the bone • Place the bone in anatomical position • Demonstrate anatomical features on bone • Discuss attachments and relations on bone • Discuss important clinical anatomy of bone • Read a relevant research article 	<ul style="list-style-type: none"> • Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 4, Page 451). • https://www.youtube.com/watch?v=93c9nlxbMUw • https://www.youtube.com/watch?v=PuOE-PI1eps

Bony pelvis	<ul style="list-style-type: none"> Identify type of pelvis Place pelvis in anatomical position Demonstrate different diameters of each type Differentiate bony features of each type Clinical importance of each type Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 327-337). https://www.youtube.com/watch?v=yK-8ZwLFarc https://www.youtube.com/watch?v=3v5AsAESg1Q https://www.youtube.com/watch?v=3Z0XBCyXb3Y
Pelvic Peritoneum and its contents	<ul style="list-style-type: none"> Identify viscera present in pelvis Demonstrate peritoneal reflections on pelvic viscera Discuss pouches formed by peritoneum Discuss clinical anatomy of pelvic peritoneum and pelvic viscera Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 338-349). https://www.youtube.com/watch?v=F2-5tX_CMIQ https://www.youtube.com/watch?v=3Z0XBCyXb3Y
Pelvic diaphragm	<ul style="list-style-type: none"> Identify the muscles forming pelvic diaphragm Demonstrate the attachments and nerve supply of muscles of pelvic diaphragm Locate the structures piercing the pelvic diaphragm Discuss clinical anatomy of pelvic diaphragm Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 338-349). https://www.youtube.com/watch?v=P3BBAMWm2Eo https://www.youtube.com/watch?v=3Z0XBCyXb3Y
Male external genitalia	<ul style="list-style-type: none"> Identify the anatomical structures of external genitalia Demonstrate anatomical position of testis Enlist layers of scrotum with its neurovasculature Discuss clinical anatomy of scrotum Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 418-419). https://www.youtube.com/watch?v=ai7MjQvenKs https://www.youtube.com/watch?v=5eHvZ2gyR1Y https://www.youtube.com/watch?v=N66sAZH1VA8
Testis	<ul style="list-style-type: none"> Identify the structure Demonstrate anatomical position of testis Discuss layers and structure of testis Discuss important clinical anatomy related to testis Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 2, Page 208-215). https://www.youtube.com/watch?v=ai7MjQvenKs https://www.youtube.com/watch?v=5eHvZ2gyR1Y https://www.youtube.com/watch?v=N66sAZH1VA8
Male genital ducts	<ul style="list-style-type: none"> Describe the anatomical position of vas deferens, seminal vesicles, ejaculatory ducts on model Discuss the anatomical relations of vas deferens, seminal vesicles, ejaculatory ducts Discuss clinical anatomy Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 376 -381). https://www.youtube.com/watch?v=N66sAZH1VA8 https://www.youtube.com/watch?v=ai7MjQvenKs

Prostate	<ul style="list-style-type: none"> Identify the position of prostate Demonstrate the anatomical features and relations of prostate Discuss clinical anatomy Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 376 -381). https://www.youtube.com/watch?v=93Ayg248u_8 https://www.youtube.com/watch?v=ai7MjQvenKs
Ovaries	<ul style="list-style-type: none"> Identify the site of ovarian fossa Discuss anatomical relations of ovary Discuss neurovasculature and hormonal effects on ovaries Discuss important clinical anatomy of ovary Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 391-392). https://www.youtube.com/watch?v=AREHaMls9Y4 https://www.youtube.com/watch?v=2tOtIqSNqbc
Fallopian tubes, Uterus	<ul style="list-style-type: none"> Identify the location of structures in pelvis Demonstrate anatomical relations of these structures Discuss normal positions of uterus with its ligaments Discuss its neurovasculature Discuss important clinical anatomy of fallopian tubes, uterus and uterine tube Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 385-390, 392-399). https://www.youtube.com/watch?v=AREHaMls9Y4 https://www.youtube.com/watch?v=PMI-iJwNt3Y https://www.youtube.com/watch?v=2tOtIqSNqbc
Cervix	<ul style="list-style-type: none"> Discuss anatomy of cervix Describe anatomical relations of cervix Describe its neurovasculature blood Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 385-390, 392-399). https://www.youtube.com/watch?v=AREHaMls9Y4 https://www.youtube.com/watch?v=PMI-iJwNt3Y
Ischio-anal fossa	<ul style="list-style-type: none"> Discuss the dimensions, boundaries and recesses Describe the contents of Ischio anal fossa Describe pudendal canal and its contents Discuss important clinical anatomy of structures Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 409-411, 416). https://www.youtube.com/watch?v=SFq0hA3PwK4 https://www.youtube.com/watch?v=K4K3a8UnS5M
Urogenital diaphragm	<ul style="list-style-type: none"> Discuss the formation of diaphragm Identify the relations and contents of diaphragm Discuss organs piercing urogenital diaphragm Discuss important clinical anatomy related to diaphragm Read a relevant research article 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 406-408). https://www.youtube.com/watch?v=edI7knFSu_k https://www.youtube.com/watch?v=ZaIRPhXavVg

Perineum & Superficial perineal pouches	<ul style="list-style-type: none"> • Identify boundaries and divisions of perineum • Discuss formation of perineal pouches • Discuss in detail the contents of superficial perineal pouches in male and female • Discuss important clinical anatomy related to superficial perineal pouches • Read a relevant research article 	<ul style="list-style-type: none"> • Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 402-405). • https://www.youtube.com/watch?v=GegidLpxW9A • https://www.youtube.com/watch?v=OwWk6tqsW8o
Deep perineal pouches	<ul style="list-style-type: none"> • Discuss in detail the contents of deep perineal pouches in male and female • Discuss important clinical anatomy related to deep perineal pouches. • Read a relevant research article 	<ul style="list-style-type: none"> • Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 406-409, 414). • https://www.youtube.com/watch?v=q0Ax3rLFc6M • https://www.youtube.com/watch?v=OwWk6tqsW8o
Blood supply of pelvis and perineum	<ul style="list-style-type: none"> • Identify major blood vessels & nerves of pelvis and perineum • Demonstrate anatomical relationships • Describe important clinical anatomy related to blood vessels of pelvis and perineum • Read a relevant research article 	<ul style="list-style-type: none"> • Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 350-357, 361). • https://www.youtube.com/watch?v=xYu56LuwdlS • https://www.youtube.com/watch?v=o4TplbDDcj8
Lymphatic drainage of pelvis and perineum	<ul style="list-style-type: none"> • Identify major lymphatic vessels of pelvis and perineum • Discuss lymphatic drainage of pelvis and perineum • Discuss important clinical anatomy • Read a relevant research article 	<ul style="list-style-type: none"> • Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 400-402). • https://www.youtube.com/watch?v=F-Ba96V0R-c • https://www.youtube.com/watch?v=o4TplbDDcj8
Sacral and Coccygeal plexus	<ul style="list-style-type: none"> • Identify various branches of sacral and coccygeal plexus • Discuss anatomical relations • Describe root values of each branch of plexus and its related applied • Read a relevant research article 	<ul style="list-style-type: none"> • Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 3, Page 357-361). • https://www.youtube.com/watch?v=DZ0IL1tHNxo • https://www.youtube.com/watch?v=f7Zig8eBCqY • https://www.youtube.com/watch?v=JqUleDnXuEI

Practicals				
Topics	At The End of Demonstration Student Should Be Able To	Learning Domains	Teaching Strategy	Assessment Tools
Testis, epididymis, ductus deferens	<ul style="list-style-type: none"> Identify the histological slide of testis, ductus deferens and epididymis Illustrate the microscopic picture of testis, ductus deferens and epididymis Enlist two points of identification of each Read relevant research article Use digital library 	P C2 C1 C3 C3	Skill Lab	OSPE
Seminal vesicles, prostate	<ul style="list-style-type: none"> Identify the histological slide of seminal vesicles and prostate Illustrate the microscopic picture of seminal vesicles and prostate Enlist two points of identification of each Read relevant research article Use digital library 	P C2 C1 C3 C3	Skill Lab	OSPE
Ovary	<ul style="list-style-type: none"> Identify the histological slide of ovary Illustrate the microscopic picture of ovary Enlist two points of identification Read relevant research article Use digital library 	P C2 C1 C3 C3	Skill Lab	OSPE
Uterus, uterine tubes	<ul style="list-style-type: none"> Identify the histological slide of Uterus and uterine tubes Illustrate the microscopic picture of Uterus and uterine tubes Enlist two points of identification of each Read relevant research article Use digital library 	P C2 C1 C3 C3	Skill Lab	OSPE

Physiology						
Theory						
Topics	At the end of lecture students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools		
Physiological anatomy of male reproductive system & spermatogenesis	<ul style="list-style-type: none"> Describe Physiological anatomy of male reproductive system Explain the steps of spermatogenesis Identify the process of meiosis Describe the hormonal factors that stimulate spermatogenesis Describe functions of seminal vesicles 	C2 C2 C2 C2 C2	LGIS	MCQ SEQ SAQ EMQ VIVA	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology. 25TH Edition. Function of Male reproductive system (Chapter 23, Page 417) Physiology by Linda S. Costanzo 6th Edition. Reproductive Physiology (Chapter 10. Page 466) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Reproduction and Development (Chapter 26 Page 843,847) Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Reproductive and hormonal Functions of the Male..Section 14. (Chapter 81, Page 1011) 	1. https://teachmephysiology.com/reproductive-system/embryology/ 2. https://www.annualreviews.org/doi/abs/10.1146/annurev.ph.36.030174.001515?journalCode=physiol

Physiological anatomy female reproductive system	<ul style="list-style-type: none"> Describe oogenesis & follicular development in ovaries Discuss female hormonal system 	C2 C2	LGIS	MCQ SEQ SAQ EMQ VIVA	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology. 25TH Edition. Reproductive development and Function of female reproductive system (Chapter 22, Page 389) Physiology by Linda S. Costanzo 6th Edition. Reproductive Physiology (Chapter 10. Page 470) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Reproduction and Development (Chapter 26 Page 852) Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Female Physiology before pregnancy and female hormones. Section 14. (Chapter 82, Page 1027) 	<p>1. https://teachmephysiology.com/reproductive-system/</p> <p>2. https://youtu.be/2_owp8kNMus</p> <p>3. https://youtu.be/rYVGjbzmAtg</p>
Semen, capacitation & acrosome reaction	<ul style="list-style-type: none"> Explain capacitation Describe acrosomal reaction Summarize the abnormalities related to spermatogenesis: <ul style="list-style-type: none"> ➤ Bilateral orchitis ➤ Effects of temperature ➤ Cryptorchidism 	C2 C2 C2	LGIS	MCQ SEQ SAQ EMQ VIVA	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology. 25TH Edition. Function of Male reproductive system (Chapter 23, Page 420) Physiology by Linda S. Costanzo 6th Edition. Reproductive Physiology (Chapter 10. Page 466) Physiological Basis of Medical Practice by Best & Taylor's. 13th 	<p>1. https://www.sciencedirect.com/science/article/abs/pii/S0093691X02009536</p> <p>2. https://www.ibbiotech.com/en/info/sperm-capacitation/</p>

					<p>Edition. Fertilization, Pregnancy and Lactation. (Chapter 59, Page 977)</p> <ul style="list-style-type: none"> Textbook of Medical Physiology by Guyton & Hall.14th Edition.Reproductive and hormonal Functions of the Male..Section 14. (Chapter 81, Page 1014) 	
MonthlyOvarian Cycle,ovulation	<ul style="list-style-type: none"> Describe gonadotropic hormones & their effects on ovaries Explain follicular phase of ovarian cycle Explain ovulation hormones Explain LH surge Describe luteinizing function of Luteinizing 	C2 C2 C2 C2 C2	LGIS	MCQ SEQ SAQ EMQ OSPE VIVA	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Reproductive development and Function of female reproductive system (Chapter 22, Page 399) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.The Female Reproductive System (Chapter 58, Page 959) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Female Physiology before pregnancy and female hormones.Section 14.(Chapter 82, Page 1028) 	1. https://courses.lumenlearning.com/wm-biology2/chapter/the-ovarian-cycle-the-menstrual-cycle-and-menopause/ 2. https://youtu.be/V9a2AQSJIMc (Dr Najeib Lectures)
Male sex hormones, Abnormalitiesofmale sexual function and spermatogenesis system	<ul style="list-style-type: none"> Describe male sex hormone's (secretion, metabolism, chemistry, degradation and 	C2 C2 C2	LGIS	MCQ SEQ SAQ	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Function of Male reproductive 	1. https://youtu.be/VS72mR5aMyo (Male reproductive system) 2. https://www.annualreviews.org/doi/abs/10.1146/annur

	<p>excretion)</p> <ul style="list-style-type: none"> • Explain functions of testosterone in detail • Describe: <ul style="list-style-type: none"> ➤ Hypogonadism in males ➤ Interstitial Leydig cell tumors ➤ Erectiledysfunctionin males 			EMQ VIVA	<p>system (Chapter 23, Page 421-426)</p> <ul style="list-style-type: none"> • Physiology by Linda S. Costanzo 6th Edition. Reproductive Physiology (Chapter 10. Page 467) • Textbook of Medical Physiology by Guyton & Hall.14th Edition.Reproductive and hormonal Functions of the Male..Section 14. (Chapter 81, Page 101) 	ev.ph.36.030174.001515?journalCode=physiol
MonthlyEndometrial Cycle and Menstruation	<ul style="list-style-type: none"> • Explain monthly endometrial cycle • Explain menstruation & physiological changes in endometrium 	C2 C2	LGIS	MCQ SEQ SAQ EMQ VIVA	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition. Reproductive development and Function of female reproductive system (Chapter 22, Page 399) • Physiology by Linda S. Costanzo 6th Edition. Reproductive Physiology (Chapter 10. Page 475) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Reproduction and Development (Chapter 26 Page 853) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Female Physiology before pregnancy and female 	https://courses.lumenlearning.com/wm-biology2/chapter/the-ovarian-cycle-the-menstrual-cycle-and-menopause/

					hormones. Section 14. (Chapter 82, Page 1036)	
Response of mother's body to pregnancy, Parturition	<ul style="list-style-type: none"> • Explain: <ul style="list-style-type: none"> ➤ Anterior pituitary gland secretion ➤ Increased corticosteroid secretion ➤ Increased thyroid gland secretion ➤ Increased parathyroid gland secretion • Explain increased uterine excitability near term • Explain hormonal factors increasing uterine contractility • Discuss mechanical factors increasing uterine contractility • Explain the physiological mechanism of labour 	<p>C2</p> <p>C2</p> <p>C2</p> <p>C2</p> <p>C2</p>	LGIS	<p>MCQ</p> <p>SEQ</p> <p>SAQ</p> <p>EMQ</p> <p>VIVA</p>	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology. 25TH Edition. Reproductive development and Function of female reproductive system (Chapter 22, Page 410, 413) • Physiology by Linda S. Costanzo 6th Edition. Reproductive Physiology (Chapter 10. Page 478, 479) • Human Physiology by Dee Unglaub Silverthorn. 8TH Edition. Reproduction and Development (Chapter 26 Page 863) • Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Fertilization, Pregnancy and Lactation. (Chapter 59, Page 994) • Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Pregnancy and Lactation. Section 14. (Chapter 82, Page 1045, 1052) 	<p>1. https://teachmeanatomy.com/reproductive-system/</p> <p>2. https://zerotofinals.com/obgyn/reproductivesystem/physiologyinpregnancy/</p> <p>3. https://www.sciencedirect.com/science/article/abs/pii/S001502822200485X</p>

Female sex hormones (estrogen and progesterone)	<ul style="list-style-type: none"> • Explain: <ul style="list-style-type: none"> ➤ Functions of estradiol & progesterone ➤ Chemistry of sex hormones ➤ Synthesis of estrogen & progesterone 	C2	LGIS	MCQ SEQ SAQ EMQ VIVA	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition. Reproductive development and Function of female reproductive system (Chapter 22, Page 404) • Physiology by Linda S. Costanzo 6th Edition. Reproductive Physiology (Chapter 10. Page 472) • Textbook of Medical Physiology 	1. https://youtu.be/hW4XpW7LfIM 2. https://teachmephysiology.com/endocrine-system/hypothalamus-pituitary/anterior-pituitary/hypothalamic-pituitary-gonadal-axis/
Lactation, Milk composition, breast feeding	<ul style="list-style-type: none"> • Explain development of breasts • Explain hormonal control of breast development • Describe the role of prolactin in lactation • Explain: <ul style="list-style-type: none"> ➤ Milk letdown reflex ➤ Milk composition ➤ Metabolic drain in mother caused by lactation 	C2 C2 C2 C2	LGIS	MCQ SEQ SAQ EMQ VIVA	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.26TH Edition. Reproductive development and Function of female reproductive system (Chapter 22, Page 414) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Female Physiology before pregnancy and female hormones. Section 14.(Chapter 82, Page 1056-1059) 	1. https://rupress.org/jgp/article/5/4/441/30794/THE-RATE-OF-DECLINE-OF-MILK-SECRETION-WITH-THE 2. https://www.annualreviews.org/doi/abs/10.1146/annurev.nutr.20.1.249
Puberty, menarche, menopause, postmenopausal symptoms & anovulatory cycles, Abnormalities of secretion by ovaries	<ul style="list-style-type: none"> • Discuss the physiology of: <ul style="list-style-type: none"> ➤ Puberty ➤ Menarche ➤ Menopause • Explain hypogonadism 	C2 C2 C2	LGIS	MCQ SEQ SAQ EMQ OSPE VIVA	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.26TH Edition. Reproductive development and Function of female reproductive system (Chapter 22, Page 396,398,408) 	1. https://journals.lww.com/clinalobgyn/Citation/1977/09000/PUBERTY_AND_MENARCHE.11.aspx 2. https://www.glowm.com/section-view/heading/Physiology%20of%20the%20Female%20Reproductive%20System

	<p>dism</p> <ul style="list-style-type: none"> Describe amenorrhoea Describe hypersecretion by ovaries 				<ul style="list-style-type: none"> Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Female Physiology before pregnancy and female hormones. Section 14. (Chapter 82, Page 1040) 	20of%20Puberty/item/285#.ZCKTtXZBzIU
<p>Fertilization of ovum, transport, implantation</p> <p>Functions of placenta</p>	<ul style="list-style-type: none"> Describe: <ul style="list-style-type: none"> ➤ Entry of ovum into fallopian tube ➤ Transport of fertilized ovum ➤ Implantation of blastocyst ➤ Early nutrition of embryo Describe physiological anatomy of placenta Explain placental permeability Explain diffusion of gases & excretion of waste products 	<p>C2</p> <p>C2</p> <p>C2</p>	<p>LGIS</p>	<p>MCQ</p> <p>SEQ</p> <p>SAQ</p> <p>EMQ</p> <p>VIVA</p>	<ul style="list-style-type: none"> ❖ Ganong's Review of Medical Physiology. 25TH Edition. Reproductive development and Function of female reproductive system (Chapter 22, Page 410) ❖ Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Fertilization, Pregnancy and Lactation. (Chapter 59, Page 975) ❖ Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Pregnancy and Lactation. Section 14. (Chapter 83, Page 1045) 	<p>1. https://teachmeanatomy.com/reproductive-system/</p> <p>2. https://my.clevelandclinic.org/health/articles/11585-conception</p>

Growth & functional development of fetus, Adjustment of infant to extrauterine life, Growth & development in child	<ul style="list-style-type: none"> Describe development of organ system in fetus Explain fetal metabolism 	C2 C2	LGIS	MCQ SEQ SAQ EMQ VIVA	<ul style="list-style-type: none"> ❖ Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition. Physiology of Pregnancy (Chapter 60, Page 998) ❖ Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Fetal and Neonatal Physiology. Section 14. (Chapter 84, Page 1061-1065) 	1. https://youtu.be/rYVGjbzmAtg 2. https://www.msdmanuals.com/home/women-s-health-issues/normal-pregnancy/stages-of-development-of-the-fetus
Hormonal factors in pregnancy, Special functional problems in neonate. Prematurity and its problems	<ul style="list-style-type: none"> Explain function of B - HCG Describe secretion of estrogens by the placenta Summarize function of estrogen in pregnancy Summarize function of progesterone in pregnancy Explain onset of breathing Describe the cause of breathing at birth Explain delayed / abnormal breathing at birth Describe changes to hypoxia 	C2 C2 C2 C2 C2 C2 C2	LGIS	MCQ SEQ SAQ EMQ OSPE VIVA	Physiological Basis of Medical Practice by Best & Taylor's. 13 th Edition. Physiology of Pregnancy (Chapter 60, Page 998) Textbook of Medical Physiology by Guyton & Hall. 14 th Edition. Fetal and Neonatal Physiology. Section 14. (Chapter 84, Page 1066-1070)	1. https://teachmeanatomy.com/reproductive-system/ 2. https://patient.info/pregnancy/premature-babies

Topics	At the end of discussion students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Infertility	<ul style="list-style-type: none"> Correlate basic knowledge with clinical application 	C3	CBL	MCQ SEQ VIVA
Menorrhagia	<ul style="list-style-type: none"> Correlate basic knowledge with clinical application 	C3	CBL	MCQ SEQ VIVA
Neonatal problems of Prematurity	<ul style="list-style-type: none"> Correlate basic knowledge with clinical application 	C3	SGD	MCQ SEQ VIVA

Topics Of SDL	Learning Objectives	Learning resources
Fertilization of ovum, transport, implantation, Functions of placenta	<ul style="list-style-type: none"> Maturation and fertilization of ovum Transport and Implantation Early nutrition of the Embryo Functions of Placenta 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Reproductive development and Function of female reproductive system (Chapter 22, Page 410) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Fertilization, Pregnancy and Lactation. (Chapter 59, Page 975) Textbook of Medical Physiology by Guyton & Hall.14th Edition. <ul style="list-style-type: none"> Pregnancy and Lactation. Section 14. (Chapter 83, Page 1045) https://teachmephysiology.com/reproductive-system/ https://my.clevelandclinic.org/health/articles/11585-conception
Growth &functional development of fetus, Adjustments of infant to extrauterine life, Growth & development in child	<ul style="list-style-type: none"> Growth & functional development of fetus Fetal Metabolism Changes in Fetal circulation at Birth Adjustment of the Infant to the Extrauterine life 	<ul style="list-style-type: none"> Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Physiology of Pregnancy (Chapter 60, Page 998) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Fetal and Neonatal Physiology. Section 14. (Chapter 84, Page 1061-1065) https://youtu.be/rYVGjbzmAtg https://www.msmanuals.com/home/women-s-health-issues/normal-pregnancy/stages-of-development-of-the-fetus

Hormonal factors in pregnancy, Special functional problems in neonate. Prematurity and its problems.	<ul style="list-style-type: none"> • Special functional problems in neonate • Prematurity • Immature development of the premature Infant • Instability of Homeostasis in Premature Infant • Instability of body temperature in Infants 	<ul style="list-style-type: none"> • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Physiology of Pregnancy (Chapter 60, Page 998) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Fetal and Neonatal Physiology. Section 14. (Chapter 84, Page 1066-1070) ○ https://teachmephysiology.com/reproductive-system/ ○ https://patient.info/pregnancy/premature-babies
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Practicals				
Practicals	At The End Of This Skill Lab, Student Should Be Able To Illustrate:	Learning Domains	Teaching Strategy	Assessment Tools
Examination of 7 th Cranial nerve	<ul style="list-style-type: none"> • Principle • Procedure • Clinical correlation • Overview of Cranial nerves • Performance of student 	C1 P3 C3 C1 P3	Skill lab	OSPE
Pregnancy Test	<ul style="list-style-type: none"> • Apparatus identification • Principle • Procedure • Precautions • Recall types of pregnancy test • Performance of student 	P3/A3 C1 P3 C1 C1 P3	Skill lab	OSPE
Examination of 3 rd ,4 th ,6 th cranial nerves	<ul style="list-style-type: none"> • Principle • Procedure • Clinical correlation of reflexes • Overview of cranial nerves 	C1 P3 C3 C1	Skill lab	OSPE

Biochemistry				
Theory				
Topics	At the end of lecture students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Male gonadal hormones	<ul style="list-style-type: none"> Synthesis mechanism of action and functions of male gonadal hormones 	C2	LGIS	MCQ SEQ VIVA
Female gonadal hormones	<ul style="list-style-type: none"> Synthesis mechanism of action and functions of female gonadal hormones 	C2	LGIS	MCQ SEQ VIVA
Digestion of nucleic acid and purine synthesis	<ul style="list-style-type: none"> Explain digestion of nucleoprotein Describe purine biosynthesis (Denovosynthesis and salvage pathway) 	C2 C2	LGIS	MCQ SEQ VIVA
Purine catabolism and related disorders	<ul style="list-style-type: none"> Explain purine catabolism Discuss related disorders 	C2 C3	LGIS	MCQ SEQ VIVA
Pyrimidine metabolism	<ul style="list-style-type: none"> Explain Pyrimidine catabolism Related disorders 	C2 C3	LGIS	MCQ SEQ VIVA
Regulation of gene expression	<ul style="list-style-type: none"> Explain the regulation of gene expression 	C2	LGIS	MCQ SEQ VIVA

Topics	At the end of tutorial students should be able to	Learning Domains	Teaching Strategy	Assessment Tools
Purine metabolism	<ul style="list-style-type: none"> Purine denovo synthesis and describe salvage pathway Read a relevant research article Use digital library 	C2 C3 C3	SGD	MCQ SEQ VIVA
Male female sex hormones	<ul style="list-style-type: none"> Synthesis, mechanism of action and functions of male female gonadal hormones Read a relevant research article Use digital library 	C2 C3 C3	SGD	MCQ SEQ VIVA

Topics Of SDL	Learning Objectives	Learning resources
Male gonadal hormones	<ul style="list-style-type: none"> Synthesis mechanism of action and functions of male gonadal hormones 	<ul style="list-style-type: none"> Text Book of Harper,32 edition (chapter 41 page – 487-488) https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/gonad-function https://www.youtube.com/watch?v=A5u_TY1A0t8 Use digital library https://www.ncbi.nlm.nih.gov/books/NBK29/
Female gonadal hormones	<ul style="list-style-type: none"> Synthesis mechanism of action and functions of female gonadal hormones 	<ul style="list-style-type: none"> Text Book of Harper,32 edition (chapter 41 page – 487-488) https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/gonad-functionn https://www.youtube.com/watch?v=A5u_TY1A0t8 Use digital library https://www.ncbi.nlm.nih.gov/books/NBK29/
Introduction to nucleic acid and purine synthesis	<ul style="list-style-type: none"> Digestion of nucleoprotein Understand whole purine synthesis (Denovo and salvage pathway) 	<ul style="list-style-type: none"> Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 22, page 292-295) https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/purine-synthesis https://www.youtube.com/watch?v=VXWyWzbigrg Use digital library https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3243375/

Purine catabolism	<ul style="list-style-type: none"> • Explain purine catabolism • Discuss related disorder 	<ul style="list-style-type: none"> • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 22, page 298-301) • https://www.sciencedirect.com/topics/medicine-and-dentistry/purine-metabolism-disorder • https://www.youtube.com/watch?v=e2KFVvI8Akk • Use digital library • https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4215161/
Pyrimidine metabolism	<ul style="list-style-type: none"> • Explain Pyrimidine catabolism and related disorders 	<ul style="list-style-type: none"> • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 22, page 302-304) • https://www.cliffsnotes.com/study-guides/biology/biochemistry-ii/purines-and-pyrimidines/pyrimidine-metabolism • https://www.youtube.com/watch?v=n7Uec8Jtr4E • Use digital library • https://www.ncbi.nlm.nih.gov/pmc/articles/PMC378357/
Regulation of gene expression	<ul style="list-style-type: none"> • Explain the regulation of gene expression 	<ul style="list-style-type: none"> • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 22, page 465-477) • https://www.healio.com/hematology-oncology/learn-genomics/genomics-primer/regulation-of-gene-expression-in-eukaryotes • https://www.youtube.com/watch?v=J9jhg90A7Lw • Use digital library • https://www.nature.com/scitable/topicpage/regulation-of-transcription-and-gene-expression-in-1086/

Practicals				
Topics	At the End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Estimation of uric acid	Perform estimation of uric acid by spectrophometer	P	Skill Lab	OSPE
Estimation of Cholestrol	Estimation of cholesterol by spectrophometer	P	Skill Lab	OSPE
Milk analysis	Protein, carbohydrates, lipid detection	P	Skill Lab	OSPE

Basic and Clinical Sciences (Vertical Integration)

Anatomy, Physiology & Biochemistry			
Theory			
Subjects	Topics	At the end of the session the student should be able to	Learning Domains
Anatomy	• Prostatic Hyperplasia	Apply basic knowledge of subject to study clinical case.	C3
	• Ovarian Cyst	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• Infertility	Apply basic knowledge of subject to study clinical case.	C3
	• Menorrhagia	Apply basic knowledge of subject to study clinical case.	C3
	• Neonatal problems of Prematurity	Apply basic knowledge of subject to study clinical case.	C3
Biochemistry	• Gout	Apply basic knowledge of subject to study clinical case.	C3
Subject	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain
PBL	• Pregnancy	Apply basic knowledge of subject to study clinical case.	C3
	• PCOS	Apply basic knowledge of subject to study clinical case.	C3

Pathology				
Theory				
Topics	At the end of lecture students of should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Sexually transmitted diseases	• Enumerate the STDs	C1	LGIS	MCQ's
	• Describe the pathogenesis of syphilis and gonorrhea	C2		

BPH/Prostatitis	<ul style="list-style-type: none"> Define benign prostatic hyperplasia Briefly discuss the morphological features of BPH & prostatitis 	C1 C2	LGIS	MCQ's
Polycystic ovaries	<ul style="list-style-type: none"> Define the polycystic ovaries Describe the pathophysiology of polycystic ovaries 	C1 C2	LGIS	MCQ's

Community Medicine				
Theory				
Topics	At the end of lecture students of should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Sexually Transmitted Diseases				
Definition	<ul style="list-style-type: none"> Define STD and its various factors 	C1	LGIS	MCQ,
Problem statement	<ul style="list-style-type: none"> Discuss the problem statement of STD worldwide. 	C2		
Types of STDs	<ul style="list-style-type: none"> Enumerate different types of STDs 	C1		
Host factors related to STDs	<ul style="list-style-type: none"> Discuss all host factors responsible for STDs 	C2		
Demographic factors	<ul style="list-style-type: none"> Discuss in detail role of demographic factors in STD spread. 	C2		
Social factors role	<ul style="list-style-type: none"> Role of social factors in STDs 	C2		
Intervention strategies.	<ul style="list-style-type: none"> Role of intervene on strategies and planning in control of STDs 	C2		
AIDS	<ul style="list-style-type: none"> Discuss In detail the definition of AIDS 	C2	LGIS	MCQ
Problem statement of AIDS and HIV	<ul style="list-style-type: none"> Discuss in detail the problem statement of HIV n AIDs. Its impact on underdeveloped eloped world. understanding the gravity of the situation. 	C2		
Risk factors	<ul style="list-style-type: none"> Discuss the key risk factors in HIV responsible. 	C2		
	<ul style="list-style-type: none"> Explain agent details 	C2		

Agent and other biological determinants	<ul style="list-style-type: none"> Describe the effect of agent stability and its biological determinants 			
Host, reservoir of infection and transmission details	<ul style="list-style-type: none"> Detailed discussion on the host factors, reservoir of infection and transmission factors responsible. 	C2		
Symptomology, treatment and prevention of AIDS and HIV	<ul style="list-style-type: none"> Discuss in detail the symptomology, treatment and prevention of AIDS and HIV . 	C2		

Surgery				
Theory				
Topics	At The End Of Lecture, Students Should Be Able To:	Learning Domains	Teaching Strategy	Assessment Tools
Male hypogonadism	<ul style="list-style-type: none"> Discuss pathophysiology, signs and symptoms of male hypogonadism Describe altered hormonal levels in male hypogonadism Outline treatment plan for breast tumors 	C2 C2 C1	LGIS	MCQ
Undescended Testes	<ul style="list-style-type: none"> Define UDT Define Retractable Testes Define Ectopic Testes Causes of UDT/Ectopic Testes Differentiate between UDT and Retractable Testes Management plan 	C1 C1 C1 C2 C2 C2	LGIS	MCQ
Acute Scrotum	<ul style="list-style-type: none"> Enumerate the causes of acute scrotum Describe Torsion, orchitis, epididymorchitisetc Differentiate between Torsion and Epididymorchitis Describe the approach towards diagnosis of acute scrotum 	C1 C2 C2 C2	LGIS	MCQ

Obstetrics & Gynaecology				
Theory				
Topics	At the end of lecture students should be able to:	Learning Domains	Teaching Strategy	Assessment Tool
Menstrual irregularity due to anovulation	<ul style="list-style-type: none"> Understand ovarian and endometrial changes during normal menstrual cycle Describe the process of ovulation under the effect of LH Describe causes of anovulation Describe effects of anovulation Enumerate the tests for confirmation of ovulation 	C2 C2 C2 C2 C1	LGIS	MCQs

List of Reproduction Module Vertical Courses Lectures						
Sr. #	Date/Day	Week	Department	Time	Topic Of Lectures	Facilitators Names And Contact Numbers
1.	30-05-2024 Thursday	1 st	Gynae And Obs	11:20am – 12:10 Pm	Early Pregnancy Complications	
2.	31-05-2024 Friday	1 st	Pharmacology	11:00am – 12:00pm	Hormonal Contraceptives	
3.	03-06-2024 Monday	2 nd	Surgery	11:20am – 12:10pm	Male hypogonadism Acute Scrotum	Dr. Mariyam (Even) Dr. Faraz (Odd)
4.	04-06-2024 Tuesday	2 nd	Pathology	11:20am – 12:10pm	Sexually transmitted diseases BPH/Prostatitis	Dr Abid Hassan (Even) Dr Rabbiya Khalid (Odd)
5.	05-06-2024 Wednesday	2 nd	Pathology	11:20am – 12:10pm	BPH/ Prostatitis Sexually transmitted diseases	Dr Abid Hassan (Odd) Dr Rabbiya Khalid (Even)
6.	06-06-2024 Thursday	2 nd	Surgery	11:20am – 12:10pm	Undescended Testes	Dr. Rameez (Even) Dr. Ameen (Odd)
7.	10-06-2024 Monday	3 rd	Pathology	10:30am – 11:20am	Polycystic ovaries	Dr Tayaba Ali (Even) Dr. Aasiya Niazi (Odd)

8.	11-06-2024 Tuesday	3 rd	Community Medicine	10:30am – 11:20am	Sexually Transmitted Diseases (STDs) Acquired immunodeficiency syndromes (AIDs)	Dr. Rizwan (Even) Dr. Asif (Odd)
9.	11-06-2024 Tuesday	3 rd	Gynae And Obs	11:20am – 12:10pm	Menstrual irregularities	Dr Shama Bashir (Even) Dr. Saira Ahmed (Odd)
10.	12-06-2024 Wednesday	3 rd	Community Medicine	11:20am – 12:10pm	Acquired immunodeficiency syndromes (AIDs) Sexually Transmitted Diseases (STDs)	Dr. Asif (Even) Dr. Rizwan (Odd)
11.	15-06-2024 Saturday	3 rd	Gynae And Obs	10:30am – 11:20am	Subfertility	

Spirally Integrated Courses / General Education Cluster (GEC) Courses

Content

- **Longitudinal Themes**
 - **The Holy Quran Translation**
 - **Pak Studies/Islamiyat Biomedical (Club Activity)**
 - **Family Medicine**
 - **Behavioral Sciences**
 - **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-5	<ul style="list-style-type: none"> Quate Example of Shrik from Surrah Ul Hajj 	C1	LGIS	MCQs
Akhlaqiat-1	<ul style="list-style-type: none"> Define Truth and Righteousness 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Describe Truth and Righteousness with help of Quranic Verses 	C2	LGIS	MCQs

Pak Studies/Islamiyat				
Theory				
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Kaamyab Logu Ki Sifaat	<ul style="list-style-type: none"> Describe Qualities of Successful People with the help of Quranic Verses and Sunnah 	C2	LGIS	MCQs
Nehru report, Quaid e Azam k 14 nukaat	<ul style="list-style-type: none"> Descirbe Nehru Report and fourteen points of Quaid e Azam 	C2	LGIS	MCQs

Family Medicine				
Theory				
Topic	At The End Of Lecture, Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
AIDS	<ul style="list-style-type: none"> Discuss pathophysiology, signs and symptoms of patients with HIV Discuss the diagnostic criteria Discuss the complications Discuss the management of disease and its complications. 	C1 C2 C2 C2	LGIS	MCQs

Behavioural Sciences				
Theory				
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Emotion	<ul style="list-style-type: none"> To define emotions. To explain the neuroanatomy and neurochemistry of emotion To handle situations with heightened emotions encountered in daily life and clinical practice 	C3	LGIS	MCQs

Biomedical (Club Activity)				
Theory				
Topics	At the end of session students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Ethical dilemmas in healthcare practice involving breach in principle of autonomy	<ul style="list-style-type: none"> Analyze ethical dilemmas in healthcare practice involving breach in principle of autonomy. Explain what procedures adopted to maintain patient autonomy. Identify situations in which doctor may have to take decisions in the best interest of the patients 	C3 C2 C1	Short video demonstration on violation of Ethical principle of autonomy from suit CBEC Video resources	<ul style="list-style-type: none"> Assignment based assessment involving real life case scenarios under aggregate Marks. (Internal Assessment) <ul style="list-style-type: none"> Assignment to be uploaded on LMS
Ethical dilemmas in healthcare practice involving breach in principle of	<ul style="list-style-type: none"> Analyze ethical dilemmas in healthcare practice involving breach in principle of beneficence and non-maleficence. Explain what procedures adopted to maintain the principle of beneficence and non-maleficence in challenging situations. Identify situations in which a doctor may 	C3 C2 C1	Short video demonstration on violation of Ethical principle of beneficence and non-maleficence from suit CBEC Video resources Students deliberations and reflections	<ul style="list-style-type: none"> Assignment based assessment involving real life case scenarios under aggregate Marks (Internal Assessment) <ul style="list-style-type: none"> Assignment to be uploaded on LMS

beneficence and non-maleficence	have to take decisions in the best interests of the patient considering the principle of beneficence and non-maleficence		Reflective writing	
Ethical dilemmas practice involving breach in principle of justice	<ul style="list-style-type: none"> Analyze ethical dilemmas in healthcare practice involving breach in principle of justice. Explain what procedures adopted to maintain the principle of justice in challenging situations. Identify situations in which a doctor may have to take decisions in the best interests of the patient considering the principle of justice 	C3 C2 C1	Short video demonstration on violation of Ethical principle of beneficence and non-maleficence from suit CBEC Video resources Students deliberations and reflections Reflective writing	<ul style="list-style-type: none"> Assignment based assessment involving real life case scenarios under aggregate Marks (Internal Assessment) Assignment to be uploaded on LMS

List of Reproduction Module Spiral Courses Lectures						
Sr. #	Date/Day	Week	Department	Time	Topic Of Lectures	Facilitators Names And Contact Numbers
1.	31-05-2024 Friday	1 st	Quran Translation - I	08:00am – 09:00 Am	Imaniat-5/ Akhlaqiat-1	Mufti Naeem (0300-5580299) Dr. Fahd (0300-5156800)
2.	31-05-2024 Friday	1 st	Pak Studies/Islamiyat	09:00am – 10:00am	Kaamyab Logu Ki Sifaat / Nehru Report, Quaid E Azam K 14 Nukaat	Mufti Naeem (0300-5580299) Qari Aman (0346-7598528)
3.	07-06-2024 Friday	2 nd	Biomedical (Club Activity)	10:00am – 12:00pm	Ethical Dilemmas Involving Breach In Autonomy	
4.	10-06-2024 Monday	3 rd	Behavioural Sciences	11:20am – 12:10pm	Emotion	
5.	12-06-2024 Wednesday	3 rd	Biomedical Ethics	10:30am – 11:20am	Ethical Dilemmas In Healthcare Practice Involving Breach In Principle Of Beneficence And Non- Maleficence	

6.	13-06-2024 Thursday	3 rd	Biomedical Ethics	10:30am – 11:20am	Ethical dilemmas practice involving breach in principle of justice	
7.	14-06-2024 Friday	3 rd	Quran Translation – II	08:00am – 09:00am	Imaniat-6 Akhlaqiat-2	Dr. Fahd Anwar (Odd) Mufti Naeem Sherazi (Even)
8.	14-06-2024 Friday	3 rd	Pak Studies/Islamiyat	09:00am – 10:00am	Nehru Report, Quaid E Azam K 14 Nukaat/ Kaamyab Logu Ki Sifaat	Qari Aman (0346-7598528) Mufti Naeem (0300-5580299)
9.	15-06-2024 Saturday	3 rd	Family Medicine	11:20am – 12:10pm	AIDS	Dr Shaheer(Even) Dr Shabaz Ashraf (Odd)

Block-II
Module No. 4 - Central Nervous System
Duration 6 Weeks

CNS Module Team

Module Name	:	CNS Module
Duration of module	:	06 Weeks
Coordinator	:	Dr. Arsalan Manzoor Mughal
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. Arsalan Manzoor Mughal (Associate Professor of Anatomy)
2.	Director DME	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Farzana Fatima
3.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf	3.	Co-coordinator	Dr. Gaiti Aara ((APWMO of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Rahat (Senior Demonstrator of Biochemistry)
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5.	Co-coordinator	Dr. Shazia (Senior Demonstrator of Physiology)
6.	Focal Person Anatomy Second Year MBBS	Dr. Maria Tasleem	DME Implementation Team		
7.	Focal Person Physiology	Dr. Sidra Hamid			
8.	Focal Person Biochemistry	Dr. Aneela Jamil	1.	Director DME	Prof. Dr. Ifra Saeed
9.	Focal Person Pharmacology	Dr. Zunera Hakim	2.	Assistant Director DME	Dr Farzana Fatima
			3.	DME Implementation Team	Prof. Dr. Ifra Saeed 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			
13.	Focal Person Quran Translation Lectures	Dr. Uzma Zafar			
14.	Focal Person Family Medicine	Dr. Sadia Khan			

Themes				
Subjects	Embryology	Histology	General Anatomy	Gross Anatomy
<ul style="list-style-type: none"> Anatomy 	<ul style="list-style-type: none"> Early CNS Development Spinal Cord Hindbrain & Cerebellum Midbrain Forebrain Peripheral Nervous System 	<ul style="list-style-type: none"> Ganglia Peripheral Nerves Spinal Cord Cerebellum Cerebrum 	<ul style="list-style-type: none"> General Anatomy of Nervous System General Anatomy of Autonomic Nervous System. 	<ul style="list-style-type: none"> Anterior, Middle & Posterior cranial fossae Meninges, Dural venous sinuses, and intracranial hemorrhages Spinal cord & Tracts Brain stem (Medulla oblongata, Pons, cerebellum & Midbrain) Diencephalon Cerebrum CSF and Ventricular System Cranial nerves Basal ganglia Limbic system & Reticular formation Blood Supply of Brain Radiological Imaging of CNS Cross Sectional Anatomy of CNS
<ul style="list-style-type: none"> Biochemistry 	<ul style="list-style-type: none"> Fatty acid metabolism Cholesterol Metabolism Ketone bodies metabolism Lipoproteins and Phospholipids Fatty Liver and hyper Lipidemias. Glycerophospholipid & Sphingo phospholipid 			
<ul style="list-style-type: none"> Physiology 	<ul style="list-style-type: none"> Organization of nervous system, Mechanism of synaptic transmission Classification of sensory receptors, Properties of sensory receptors Properties of synaptic transmission Physiology of pain, Dual pathway for transmission of pain, Analgesia System and Thermal sensations Sensory pathways for transmitting somatic signals Introduction to autonomic nervous system Basic Characteristics of sympathetic & parasympathetic function Somatosensory cortex & lesions of Somatosensory cortex Excitatory & inhibitory effects of sympathetic & parasympathetic stimulation CSF, Blood brain barrier, Blood CSF Barrier, Lumber puncture Concept of Association areas, Concept of Dominant and non-dominant cerebral hemispheres 			

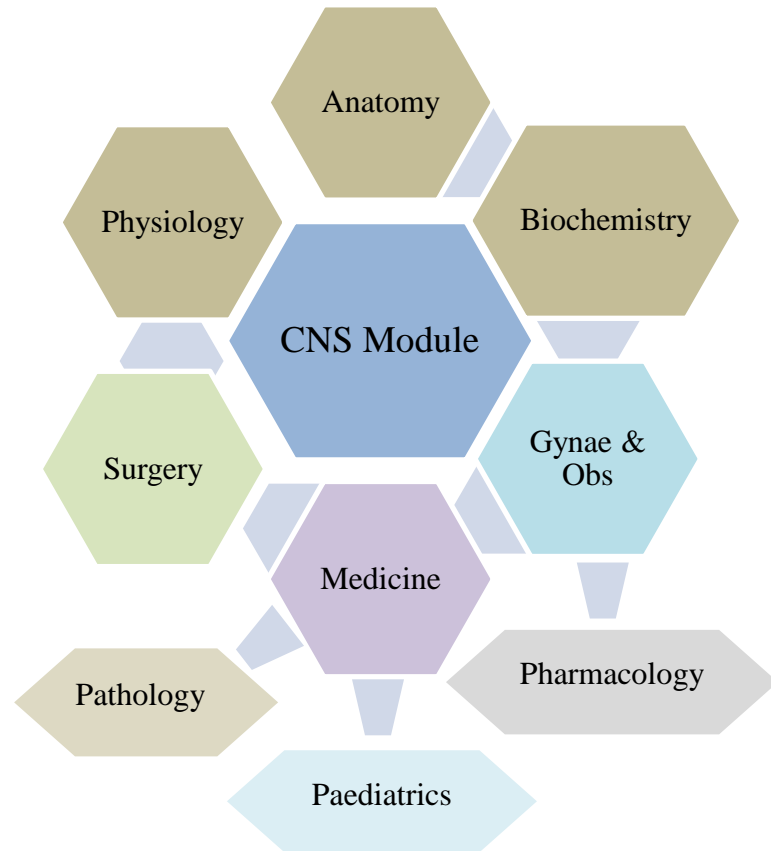
	<ul style="list-style-type: none"> • Limbic system, • Functions of hypothalamus • Speech and aphasia • Learning and memory • Reticular activating system and sleep • EEG and epilepsy • Introduction to motor nervous system & Reflex action, Conditioned reflexes & Properties of reflex action, Control of spinal cord reflexes by higher centers • Introduction to cerebellum, Neuronal circuits of cerebellum, and its motor functions • Muscle spindle & Golgi tendon organ, Role of muscle spindle and Golgi tendon organ in voluntary motor activity
Spiral Courses	
<ul style="list-style-type: none"> • The Holy Quran Translation 	<ul style="list-style-type: none"> • Imaniyaat-5 • Imaniyaat-6 • Momalat-I • Momalat-II
<ul style="list-style-type: none"> • Pak Studies / Islammiyat 	<ul style="list-style-type: none"> • Musawat • Tehreek-e-Pakistan (1940-1947) • Khwateen k hakook • Qayam e Pakistan, Ibtidai Mushkilaat
<ul style="list-style-type: none"> • Bioethics & Professionalism 	<ul style="list-style-type: none"> • Ethical dilemmas in healthcare practice involving breach in principle of autonomy • Ethical dilemmas in healthcare practice involving breach in principle of beneficence and non-maleficence • Ethical dilemmas practice involving breach in principle of justice
<ul style="list-style-type: none"> • Radiology & Artificial Intelligence 	<ul style="list-style-type: none"> • Skull radiograph • CT Scan & MRI
<ul style="list-style-type: none"> • Family Medicine 	<ul style="list-style-type: none"> • Approach to a patient with headache
<ul style="list-style-type: none"> • Behavioral Sciences 	<ul style="list-style-type: none"> • Emotions • Memory
Vertical Integration	
<ul style="list-style-type: none"> • Pharmacology 	<ul style="list-style-type: none"> • Introduction to CNS
<ul style="list-style-type: none"> • Pathology 	<ul style="list-style-type: none"> • Patterns of injury in nervous system • Meningitis
<ul style="list-style-type: none"> • Pediatrics 	<ul style="list-style-type: none"> • Meningitis • Cerebral palsy, Polio
<ul style="list-style-type: none"> • Surgery 	<ul style="list-style-type: none"> • Spinal injury and head injury • Management of hydrocephalus

	<ul style="list-style-type: none">• Brain abscess• Polytrauma patient
<ul style="list-style-type: none">• Medicine	<ul style="list-style-type: none">• Spinal cord and peripheral nervous system• Encephalitis• Cerebellar disorders• Epilepsy and other convulsive disorders• Stroke
<ul style="list-style-type: none">• Gynecology & Obs	<ul style="list-style-type: none">• Seizures during pregnancy (eclampsia/ epilepsy)
Early Clinical Exposure (ECE)	
<ul style="list-style-type: none">• Medicine	<ul style="list-style-type: none">• Cases of stroke• Paraplegia• Vegetative state
<ul style="list-style-type: none">• Surgery/ Neurosurgery	<ul style="list-style-type: none">• Head injury.• Nerve injuries
<ul style="list-style-type: none">• Radiology	<ul style="list-style-type: none">• CT scan• Brain• Normal• Stroke• Hemorrhage• Infarction Hydrocephalus• Brain atrophy• Brain Edema• Skull/ spine Fractures• MRI Brain/ Spine
Clinical Themes	
<ul style="list-style-type: none">• Stroke: Types, Pathophysiology, and Acute Management• Epilepsy: Mechanisms, Classification, and Treatment• Pathophysiology of Parkinson’s Disease and its Clinical Features• Dementia: Causes (e.g., Alzheimer’s) and Diagnosis• Spinal Cord Injuries: Levels and Clinical Outcomes• Headaches: Differentiating Migraine, Cluster, and Tension Headaches• Meningitis: Diagnosis and Management• Peripheral Neuropathy: Causes and Clinical Features• Multiple Sclerosis: Pathogenesis and Symptoms• Raised Intracranial Pressure: Causes and Management	

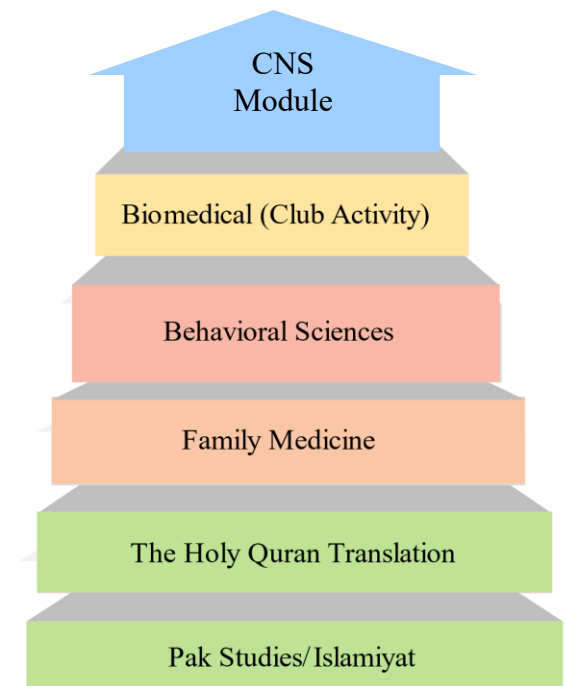
Implementation of Terms of Reference (TORS)

- 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 CNS Module



Spiral / General Education Cluster Courses



Module No. 4 – CNS

Rationale: The human nervous system is the most complex and versatile achievement of the process of evolution. The nervous system of all animals functions to detect changes in the external and internal environment and to bring about appropriate responses in the muscles, organs and glands.

The anatomical, physiological, biochemical and molecular foundation of some of these aspects of neural function are well understood, while others continue to occupy the professional lives of many thousands of researchers in both the basic and clinical sciences.

The nervous system is often damaged by inherited or developmental abnormalities by disease processes and by traumatic injury. The prevention, diagnosis and management of neurological disorders are therefore of immense socioeconomic importance.

This module is expected to build the student's basic knowledge about the normal structure, organization, functions and development of nervous system. This knowledge, skills and attitudes acquired will serve as a fabric on which the student will weave further knowledge about the etiology, pathology and pathogenesis of diseases of nervous system and the principles of their management.

Module Outcomes

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

Knowledge

- Describe the development, structure, functions and biochemical processes of the nervous system.
 - Briefly describe the injuries and diseases of the nervous system such as Alzheimer's disease, Parkinson's Disease, etc.
 - Classify the main drug groups act on the nervous system.
 - Identify the medical conditions related to nervous system such as stroke, cerebellar disorders, meningitis etc.
 - Identify the surgical conditions related to the nervous system such as head injury brain tumors and abscesses.
 - Identify obstetrical conditions related to nervous system such as preeclampsia.
 - Identify pediatric conditions related to nervous system such as meningitis, cerebral palsy and polio.
 - Identify parts of the CNS on radiographs CT scans and MRIs.
 - Identify ENT and ophthalmological conditions such as acoustic neuroma and strabismus.
 - Describe aspects of behavioral sciences such as Emotions and Memory.
 - Used technology based Medical Education including Artificial Intelligence.
-

- Appreciate concept and importance of Biomedical Ethics, & Research.

Skills

- Demonstrate dissection and identification of various parts of the nervous system.
- Identify, draw and label histological slides of the nervous system.
- Perform examination of sensory system, motor system, special senses and cranial nerves.
- Demonstrate effective skill for performing estimation of cholesterol, triglycerides and HDL.
- Demonstrate awareness of ethical, legal and social implication 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 6 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 Central Nervous System (Module No. 4)

Anatomy				
Theory				
Topic	At The End Of The Session Student Should Be Able To	C/P/A	Teaching Strategy	Assessment Tool
General Anatomy Nervous System	• Discuss the major divisions of nervous system	C2	LGIS	MCQs SAQs SEQs VIVA
	• Differentiate between neurons and neuroglia	C2		
	• List the neuroglia and their functions	C1		
	• Describe myelination of nerve fibers	C2		
	• Describe the structure of a peripheral nerve and reflex action	C2		
	• Describe degeneration and regeneration of nerves	C2		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Embryology Early development of Skull & Central Nervous System	• Describe the process of development of neurocranium and viscerocranium	C2	LGIS	MCQs SAQs SEQs VIVA
	• Describe formation of neural tube, neuropores and their closure	C2		
	• Describe histogenesis and Cytodifferentiation within the neural tube.	C2		
	• Describe the brain flexures and their derivatives	C2		
	• Describe role of neuroblasts forming efferent and afferent rows.	C2		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Embryology Development of spinal cord	• Describe the significance of ventricular, mantle and marginal layers of developing spinal cord.	C2	LGIS	MCQs SAQs SEQs VIVA
	• Enumerate derivatives of alar and basal plates in developing spinal cord.	C1		
	• Describe the process of myelination of nerve fibers.	C2		
	• Describe role of neural crest cells in development of spinal ganglia.	C2		
	• Explain positional changes of spinal cord.	C2		
	• Discuss congenital anomalies due to neural tube defects and abnormal histogenesis.	C3		

	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
General Anatomy Autonomic Nervous System	• Enlist the components of peripheral and autonomic system.	C1	LGIS	MCQs SAQs SEQs VIVA
	• Tabulate differences between sympathetic and parasympathetic nervous systems	C2		
	• Describe effects of sympathetic and parasympathetic nervous systems on various parts of the body	C2		
	• Discuss the anatomical basis of autonomic injuries such as Horner's syndrome, Urinary bladder dysfunction, rectal distention, Erectile dysfunction are argyll Robertson pupil.	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Histology Meninges, Choroid Plexus, Peripheral Nervous system and ganglia	• Describe the histological structure of meninges and choroid plexus	C2	LGIS	MCQs SAQs SEQs VIVA
	• Discuss the histological structure of Myelinated and unmyelinated nerve fibers	C2		
	• Discuss the histological structure of sensory and autonomic ganglia	C2		
	• Discuss the principles of neuroplasticity and regeneration	C2		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Embryology Development of Rhombencephalon	• Describe the development of Myelencephalon.	C2	LGIS	MCQs SAQs SEQs VIVA
	• Describe the arrangement of neuroblasts in metencephalon	C2		
	• Describe the development of metencephalon.	C2		
	• Describe the arrangement of neuroblasts in metencephalon	C2		
	• Describe the development of cerebellum	C2		
	• Correlate with the clinical conditions & cross sections.	C3		

	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> Read relevant research article. 	C3		
Histology Spinal Cord and Cerebellum	<ul style="list-style-type: none"> Describe the histological structure of spinal cord 	C2	LGIS	MCQs SAQs SEQs VIVA
	<ul style="list-style-type: none"> Describe the histological structure of cerebellum 	C2		
	<ul style="list-style-type: none"> Discuss cells in each layer along with its histological morphology 	C2		
	<ul style="list-style-type: none"> Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> Read relevant research article. 	C3		
Embryology Development Mesencephalon and Prosencephalon	<ul style="list-style-type: none"> Describe the development of mesencephalon 	C2	LGIS	MCQs SAQs SEQs VIVA
	<ul style="list-style-type: none"> Describe the arrangement of neuroblasts in mesencephalon 	C2		
	<ul style="list-style-type: none"> Describe the development of mesencephalon 	C2		
	<ul style="list-style-type: none"> Describe the arrangement of neuroblasts in mesencephalon 	C2		
	<ul style="list-style-type: none"> Describe the development of pituitary gland 	C2		
	<ul style="list-style-type: none"> Discuss the anatomical basis of pharyngeal hypophysis and craniopharyngiomas 	C3		
	<ul style="list-style-type: none"> Discuss the anatomical basis of birth defects such as encephalocele, microencephaly, microcephaly, Chiari malformation. 	C3		
	<ul style="list-style-type: none"> Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> Read relevant research article. 	C3		
Histology Cerebrum	<ul style="list-style-type: none"> Describe the histological structure of cerebrum 	C2	LGIS	MCQs SAQs SEQs VIVA
	<ul style="list-style-type: none"> Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> Read relevant research article. 	C3		
	<ul style="list-style-type: none"> Describe the development cranial nerves 	C2		
	<ul style="list-style-type: none"> Describe the development of spinal nerves 	C2		

Embryology Development of peripheral and autonomic nervous system	• Describe the development of sympathetic nervous system	C2	LGIS	MCQs SAQs SEQs VIVA
	• Describe the development of parasympathetic nervous system	C2		
	• Correlate with the clinical conditions	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Embryology Development of Cranium	• Describe the development of different steps of cartilaginous and membranous viscerocranium and neuro-cranium.	C2	LGIS	MCQs SAQs SEQs VIVA
	• Discuss the postnatal growth of the cranium	C2		
	• Correlate with the clinical conditions.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		

Topic	At The End Of Lecture Students Should Be Able To	C/P/A	Teaching Strategy	Assessment Tool
Anterior & Middle cranial fossae	• Identify and describe the boundaries of anterior and middle cranial fossae	C2	Skills lab	• MCQs • SAQs • SEQ • OSPE VIVA
	• Discuss anatomical features present in anterior and middle cranial fossa	C2		
	• Locate foramina and describe the structures passing through them	C2		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Posterior cranial fossa	• Identify and describe the boundaries of posterior cranial fossa	C2	Skills lab	• MCQs • SAQs • SEQ • OSPE VIVA
	• Discuss anatomical features present in posterior cranial fossa	C2		
	• Locate foramina and describe the structures passing through them	C2		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		

Meninges, Dural venous sinuses, and intracranial hemorrhages	<ul style="list-style-type: none"> Identify and describe meninges and their reflections on specimens and models 	C2	Skills lab	<ul style="list-style-type: none"> MCQs SAQs SEQ OSPE VIVA
	<ul style="list-style-type: none"> Describe the attachments and relations of dural venous sinuses of brain with the help of models and specimens 	C2		
	<ul style="list-style-type: none"> Discuss the clinical importance of facial vein connection with dural venous sinuses. 	C3		
	<ul style="list-style-type: none"> Differentiate between various types of intracranial hemorrhages 	C3		
	<ul style="list-style-type: none"> Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> Read relevant research article. 	C3		
	<ul style="list-style-type: none"> Differentiate between different types of headaches 	C3		
Spinal cord	<ul style="list-style-type: none"> Describe the internal and external structure of spinal cord 	C2	Skills lab	<ul style="list-style-type: none"> MCQs SAQs SEQ OSPE VIVA
	<ul style="list-style-type: none"> Compare the arrangement of white and gray matter in different regions of the spinal cord 	C2		
	<ul style="list-style-type: none"> Enumerate the major ascending and descending tracts of spinal cords 	C1		
	<ul style="list-style-type: none"> Illustrate the arrangements of ascending and descending tracts in the spinal cords 	C2		
	<ul style="list-style-type: none"> Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> Read relevant research article. 	C3		
Ascending tracts and their clinicals	<ul style="list-style-type: none"> List the ascending tracts of the spinal cord 	C1	Skills lab	<ul style="list-style-type: none"> MCQs SAQs SEQ OSPE VIVA
	<ul style="list-style-type: none"> Tabulate the sensation, receptor, first to third order neurons, pathways and destinations 	C2		
	<ul style="list-style-type: none"> Describe and illustrate the pathways of lateral spinothalamic tract, anterior spinothalamic tract, anterior spinocerebellar tract and posterior spinocerebellar tracts 	C2		
	<ul style="list-style-type: none"> Describe and illustrate the pathways of spinotectal tract, spinoreticular tract and spino-olivary tracts 	C2		
	<ul style="list-style-type: none"> Describe the anatomical basis of the signs and symptoms in lesions of the ascending tracts 	C3		

	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Descending tracts and their clinicals	• List the descending tracts of the spinal cord	C1	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE VIVA
	• Tabulate the sensation, receptor, first to third order neurons, pathways and destinations of pyramidal and extrapyramidal tracts	C2		
	• Describe and illustrate the pathways of corticospinal tracts	C2		
	• Describe and illustrate the pathways of extrapyramidal tracts	C2		
	• Describe the anatomical basis of the signs and symptoms in lesions of upper and lower motor neuron lesions	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Lesions of Spinal Cord	• Explain anatomical basis of signs and symptoms of anterior and posterior nerve root lesions	C3	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE VIVA
	• Explain anatomical basis of signs and symptoms of complete cord transection syndrome, central cord syndrome, syringomyelia, anterior cord syndrome, Brown-Sequard Syndrome, Poliomyelitis and amyotrophic lateral sclerosis	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Medulla oblongata	• Identify and describe gross features of medulla and identify them on gross specimen/model.	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE
	• Identify and describe internal structure of medulla on cross sectional diagrams.	C2		
	• Describe the anatomical basis and clinical features of raised pressure in posterior cranial fossa, Arnold Chiari malformation, lateral and medial medullary syndrome.	C2		

	• Correlate with the clinical conditions & cross sections.	C3		VIVA
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Pons & the Fourth ventricle	• Identify and describe the gross features of Pons on a given specimen/model	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE VIVA
	• Identify and describe internal structure of pons on cross sectional diagrams.	C2		
	• Describe the boundaries and relations of 4th ventricle	C2		
	• Describe the anatomical basis of clinical features of tumors, hemorrhage and infarctions of pons	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Midbrain & Cerebral aqueduct	• Identify and describe the gross features of Pons on a given specimen/model	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE VIVA
	• Identify and describe internal structure of pons on cross sectional diagrams.	C2		
	• Describe the boundaries and relations of 4th ventricle	C2		
	• Describe the anatomical basis of trauma, cerebral aqueduct stenosis and vascular lesions of midbrain.	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Cerebellum	• Identify and describe the gross features of cerebellum	C1	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE
	• Describe internal structure of gray and white matter of cerebellar cortex	C2		
	• Describe the cerebellar cortical mechanisms	C1		
	• Describe afferent and efferent fibers of cerebellum	C2		
	• Discuss the functions of cerebellum	C2		
	• Describe the anatomical basis of signs and symptoms of cerebellar diseases such as hypotonia, gait alteration, ataxia, dysdiadochokinesia, disturbances in reflexes, disturbances in ocular movement, disorders of speech	C3		
	• Describe the anatomical basis of signs and symptoms of cerebellar syndromes such as vermis syndrome and cerebellar hemisphere syndrome	C3		

	• Correlate with the clinical conditions & cross sections.	C3		VIVA
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Thalamus, Epithalamus & Subthalamus	• Identify and describe the gross structure of thalamus, epithalamus and subthalamus	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE • VIVA
	• Enlist nuclei of thalamus, epithalamus & subthalamus and describe their functions	C1		
	• Describe the anatomical basis for the lesions of thalamus, epithalamus and subthalamus such as thalamic pain and thalamic hand	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Hypothalamus and 3 rd Ventricle	• Enlist nuclei of thalamus, epithalamus & subthalamus and describe their functions	C1	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE • VIVA
	• Identify and describe the functions of tuber cinereum and mamillary bodies	C2		
	• Describe the various afferent and efferent connections of hypothalamic nuclei	C2		
	• Describe the anatomical basis for the lesions of hypothalamus and hypothalamic syndromes	C3		
	• Describe the boundaries and relations of the 3rd ventricle	C2		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Cortical areas, Layers and Lesions of Cerebrum	• Identify and describe the gross features of cerebrum	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ
	• Identify the describe the lobes and subdivisions of cerebrum	C2		
	• Identify the sulci and gyri of cerebral cortex and describe their functions	C2		
	• Identify and describe the commissural, association and projection fibers present in the white matter of the brain.	C2		

	<ul style="list-style-type: none"> • Discuss the anatomical basis of lesions of internal capsule and alzheimer's disease 	C3		<ul style="list-style-type: none"> • OSPE • VIVA
	<ul style="list-style-type: none"> • Discuss the anatomical basis of cerebral cortical lesions of the motor cortex, frontal eye field, motor & sensory speech areas, prefrontal cortex, sensory cortex and visual areas 	C3		
	<ul style="list-style-type: none"> • Discuss the anatomical basis of schizophrenia and frontal lobectomy 	C3		
	<ul style="list-style-type: none"> • Discuss the basis cerebral dominance, consciousness, persistent vegetative state, sleep and epilepsy. 	C3		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> • Read relevant research article. 	C3		
Lateral Ventricle &CSF	<ul style="list-style-type: none"> • Describe the relations and boundaries of lateral ventricle 	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE • VIVA
	<ul style="list-style-type: none"> • Describe the formation of choroid plexus in ventricles 	C2		
	<ul style="list-style-type: none"> • Explain the function, production, circulation, and absorption of cerebrospinal fluid 	C2		
	<ul style="list-style-type: none"> • Explain the causes of overproduction and blockage of CSF 	C2		
	<ul style="list-style-type: none"> • Discuss the anatomical basis of various types of hydrocephalus and papilledema. 	C3		
	<ul style="list-style-type: none"> • Discuss the formation and clinical significance of blood brain barrier, blood CSF barrier and CSF Brain interface. 	C3		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> • Read relevant research article. 	C3		
Cranial nerves I,II,II,IV,VI	<ul style="list-style-type: none"> • Identify the nuclei and connections of CN I,II,II,IV,VI 	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE
	<ul style="list-style-type: none"> • Trace the pathway and perform reflexes associated with of CN I,II,II,IV,VI 	C2		
	<ul style="list-style-type: none"> • Describe the anatomical basis of lesions of visual pathway and ophthalmoplegias 	C3		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethics. 	C3		

	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care. • Read relevant research article. 	C3		• VIVA
		C3		
Cranial nerves V,VII	• Identify the nuclei and connections of CN V,VII	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE • VIVA
	• Trace the pathway and perform reflexes associated with of CN V,VII	C2		
	• Describe the anatomical basis of upper and lower motor neuron lesion of CN V and trigeminal neuralgia	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Cranial nerves VIII-XII	• Identify the nuclei and connections of CN VIII-XII	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE • VIVA
	• Trace the pathway and perform reflexes associated with of CN VIII-XII	C2		
	• Discuss the anatomical basis of vertigo, nystagmus, deafness, tinnitus, taste and gag reflex	C3		
	• Discuss the anatomical basis of paralysis of muscles supplied by accessory and hypoglossal nerves	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Basal ganglia	• Enlist components of basal ganglia	C1	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE VIVA
	• Discuss functions of basal ganglia	C2		
	• Describe the connections of basal ganglia	C2		
	• Discuss the anatomical basis of hypo and hyperkinetic disorders such as chorea, hemiballismus, Parkinson's disease and athetosis.	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
	• Enlist components and connections of limbic system	C1		
	• Discuss functions of limbic system	C2		

Limbic system & Reticular formation	• Describe the connections of limbic system	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE • VIVA
	• Enlist components of reticular system	C1		
	• Discuss functions of reticular system	C2		
	• Describe the connections of reticular system	C1		
	• Discuss the anatomical basis of loss of consciousness, schizophrenia, Kluver-Bucy syndrome and temporal lobe dysfunction	C3		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Blood Supply of Brain and clinicals	• Describe the arterial supply of brain and spinal cord from internal carotid artery and vertebrobasilar systems	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE • VIVA
	• Describe the circle of Willis along with its clinical significance	C2		
	• Describe the venous drainage of brain and spinal cord	C2		
	• Discuss the anatomical basis of signs and symptoms of cerebral vessel occlusions and spinal cord ischemias.	C3		
	• Correlate with the clinical conditions & cross sections & cross sections	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Radiological Imaging of CNS	• Identify and describe the appearance of different parts of brain in <ul style="list-style-type: none"> ○ Normal radiographs ○ MRI ○ CT scan 	C2	Skills lab	<ul style="list-style-type: none"> • MCQs • SAQs • SEQ • OSPE • VIVA
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Cross Sectional Anatomy	• Identify different structures of male pelvis at different levels; S5, coccyx, Symphysis pubis, ischial tuberosity, anal verge	C2	Skill Lab	<ul style="list-style-type: none"> • MCQs • SAQs
	• Identify different structures of female pelvis at different levels; S5, coccyx, Symphysis pubis, ischial tuberosity, anal verge	C2		
		C3		

	<ul style="list-style-type: none"> Practice the principles of bioethics. Apply strategic use of A.I in health care Read a relevant research article 	C3 C3 C3		<ul style="list-style-type: none"> SEQ OSPE VIVA
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Topics	Learning objectives	Learning Resources
Anterior And middle Cranial Fossa	<ul style="list-style-type: none"> Identify and describe the boundaries of anterior and middle cranial fossae Discuss anatomical features present in anterior and middle cranial fossa Locate foramina and describe the structures passing through them 	<ul style="list-style-type: none"> Clinically Oriented Anatomy, 9th Edition, pg no. 840-861 https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9z https://link.springer.com/article/10.1007/s00701-013-1937-0
Posterior cranial fossa Dural venous sinuses and intracranial hemorrhages	<ul style="list-style-type: none"> Identify and describe meninges and their reflections on specimens and models Describe the attachments and relations of dural venous sinuses of brain with the help of models and specimens Discuss the clinical importance of facial vein connection with dural venous sinuses. Differentiate between various types of intracranial hemorrhages Differentiate between different types of headaches 	<ul style="list-style-type: none"> Clinically Oriented Anatomy, 9th Edition, pg no. 840-861, 884-885, 895 https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9z https://www.tandfonline.com/doi/abs/10.3109/02688699308995089
Meninges & Spinal cord	<ul style="list-style-type: none"> Describe the internal and external structure of spinal cord Compare the arrangement of white and gray matter in different regions of the spinal cord Enumerate the major ascending and descending tracts of spinal cords Illustrate the arrangements of ascending and descending tracts in the spinal cord 	<ul style="list-style-type: none"> Clinically Oriented Anatomy, 9th Edition, pg no. 132-139, 883, 890-891 https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9z https://link.springer.com/chapter/10.1007/978-981-15-7771-0_3
Ascending tracts & Descending tracts	<ul style="list-style-type: none"> List the ascending tracts of the spinal cord Tabulate the sensation, receptor, first to third order neurons, pathways and destinations Describe and illustrate the pathways of lateral spinothalamic tract, anterior spinothalamic tract, anterior spinocerebellar tract and posterior spinocerebellar tracts Describe and illustrate the pathways of spinotectal tract, spinoreticular tract and spino-olivary tracts 	<ul style="list-style-type: none"> Snell's Clinical Neuroanatomy 8th Edition, pg no. 131-182 https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9z https://link.springer.com/chapter/10.1007/978-1-4684-7688-0_7

	<ul style="list-style-type: none"> Describe the anatomical basis of the signs and symptoms in lesions of the ascending tracts 	
Medulla Oblongata, Pons & Cerebellum	<ul style="list-style-type: none"> Identify and describe gross features of medulla and identify them on gross specimen/model. Identify and describe internal structure of medulla on cross sectional diagrams. Identify and describe the gross features of Pons on a given specimen/model Identify and describe internal structure of pons on cross sectional diagrams. Identify and describe the gross features of cerebellum Describe internal structure of gray and white matter of cerebellar cortex Describe the cerebellar cortical mechanisms 	<ul style="list-style-type: none"> Snell's Clinical Neuroanatomy 8th Edition, pg no. 185-247 https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9zhttps://link.springer.com/chapter/10.1007/978-1-61779-779-8_13
Midbrain and Diencephalon	<ul style="list-style-type: none"> Identify and describe the gross features of Pons on a given specimen/model Identify and describe internal structure of pons on cross sectional diagrams. Describe the boundaries and relations of 4th ventricle Describe the anatomical basis of trauma, cerebral aqueduct stenosis and vascular lesions of midbrain. 	<ul style="list-style-type: none"> Snell's Clinical Neuroanatomy 8th Edition, pg no. 209, 363-372 https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9zhttps://link.springer.com/chapter/10.1007/978-3-319-60187-8_8
Cerebrum & Ventricular system	<ul style="list-style-type: none"> Identify and describe the gross structure of thalamus, epithalamus and subthalamus Enlist nuclei of thalamus, epithalamus & subthalamus and describe their functions Identify and describe the functions of tuber cinereum and mamillary bodies Describe the relations and boundaries of ventricles Describe the formation of choroid plexus in ventricles Explain the function, production, circulation, and absorption of cerebrospinal fluid Explain the causes of overproduction and blockage of CSF 	<ul style="list-style-type: none"> Snell's Clinical Neuroanatomy 8th Edition, pg no. 249-277, 436-462 https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9zhttps://link.springer.com/article/10.1007/BF00344224 https://www.tandfonline.com/doi/full/10.1080/10255840701492118
Canial Nerves 1-7	<ul style="list-style-type: none"> Identify the nuclei and connections of CN 1,2,3,4,& 6 Trace the pathway and perform reflexes associated with of CN 1,2,3,4,& 6 Describe the anatomical basis of lesions of visual pathway and ophthalmoplegias Identify the nuclei and connections of CN 5 & 7 Trace the pathway and perform reflexes associated with of CN 5 & 7 Describe the anatomical basis of upper and lower motor neuron lesion of CN 5 and trigeminal neuralgia 	<ul style="list-style-type: none"> Snell's Clinical Neuroanatomy 8th Edition, pg no. 323-361 https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9zhttps://link.springer.com/referenceworkentry/10.1007/978-3-540-29678-2_1315

Cranial Nerves 8-12, Basal Ganglia, Limbic system and Reticular Formation	<ul style="list-style-type: none"> • Identify the nuclei and connections of CN 8-12 • Trace the pathway and perform reflexes associated with of CN 8-12 • Discuss the anatomical basis of vertigo, nystagmus, deafness, tinnitus, taste and gag reflex • Discuss the anatomical basis of paralysis of muscles supplied by accessory and hypoglossal nerves • Enlist components and connections of limbic system • Discuss functions of limbic system • Describe the connections of limbic system • Enlist components of reticular system • Discuss functions of reticular system • Describe the connections of reticular system • Discuss the anatomical basis of loss of consciousness, schizophrenia, Kluver-Bucy syndrome and temporal lobe dysfunction 	<ul style="list-style-type: none"> • Clinically Oriented Anatomy 9th Edition, pg no. 299-308, 310- 321, 323-361. • https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9z • https://link.springer.com/referenceworkentry/10.1007/978-3-540-29678-2_1315 • https://link.springer.com/book/10.1007/978-1-4615-1235-6
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Practicals				
Practical	At The End Of This Skill Lab, Should Be Able To Illustrate:	Learning Domain	Teaching Strategy	Assessment Tools
Ganglia	• Identify the microscopic features of ganglia	P	Skills lab	OSPE VIVA
	• Illustrate histological picture of ganglia	C2		
	• List two points of identification	C1		
	• Correlate with the clinical conditions & cross sections.	C3		
	• Understand curative and preventive health care measures.	C3		
	• Practice the principles of bioethics.	C3		
	• Apply strategic use of A.I in health care.	C3		
	• Read relevant research article.	C3		
Peripheral nerve	• Identify the microscopic features of peripheral nerve on given histological slide	P	Skills lab	OSPE
	• Illustrate histological picture of peripheral nerve	C2		
	• List two points of identification	C1		

	<ul style="list-style-type: none"> • Correlate with the clinical conditions & cross sections. 	C3		VIVA
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> • Read relevant research article. 	C3		
Spinal cord	<ul style="list-style-type: none"> • Identify histological slide of spinal cord 	P	Skills lab	OSPE VIVA
	<ul style="list-style-type: none"> • Illustrate histological picture of spinal cord 	C2		
	<ul style="list-style-type: none"> • List two points of identification 	C1		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> • Read relevant research article. 	C3		
Cerebellum	<ul style="list-style-type: none"> • Identify the microscopic features of cerebellum 	P	Skills lab	OSPE VIVA
	<ul style="list-style-type: none"> • Illustrate histological picture of cerebellum 	C2		
	<ul style="list-style-type: none"> • List two points of identification 	C1		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions & cross sections. 	C3		
	<ul style="list-style-type: none"> • Understand curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice the principles of bioethics. 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of A.I in health care. 	C3		
	<ul style="list-style-type: none"> • Read relevant research article. 	C3		

Physiology						
Theory						
Topic	At The End Of This LGIS, Second Year MBBS Students Should Be Able To:	Learning Objectives	Teaching Strategy	Assessment Tools	References	Learning Resources
Organization of Nervous System Mechanism of synaptic transmission	• Describe the general organization of nervous system	C1	LGIS	MCQ SEQ VIVA	• Ganong's Review of Medical Physiology.25TH Edition. Central and Peripheral Neurophysiology Section 02 (Chapter 08, Page 168) • Physiology by Linda S. Costanzo 6th Edition. Neurophysiology (Chapter 03. Page 82) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 48, Page 601,609)	• https://youtu.be/432AD7JZnKE https://www.osmosis.org/learn/Somatosensory_pathways
	• Describe major levels of CNS functions	C1				
	• Briefly explain nerve fiber structure, classification & properties	C2				
	• Describe labeled line principle	C1				
	• Define synapse	C1				
	• Enumerate & compare types of synapses	C2				
	• Describe process of synaptic transmission	C1				
Classification of sensory receptors Properties of sensory receptors	• Enumerate & explain different types of sensory receptors according to function	C1	LGIS	MCQ SEQ VIVA	• Ganong's Review of Medical Physiology.25TH Edition. Central and Peripheral Neurophysiology Section 02 (Chapter 08, Page 168) • Physiology by Linda S. Costanzo 6th Edition. Neurophysiology (Chapter 03. Page 82) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 48, Page 601,609)	• https://youtu.be/432AD7JZnKE https://www.osmosis.org/learn/Somatosensory_pathways
	• Enumerate & explain different types of sensory receptors according to location	C2				
	• Enlist various properties of sensory receptors	C1				
	• Describe mechanism of signal transduction & generation of receptor potential	C1				
	• Describe mechanism of adaptation of different types of receptors	C1				
	• Describe the properties of sensory receptors	C1				
	• Describe the types and characteristics of tactile receptors	C1				
	• Briefly explain the electrical events during neuronal excitation and inhibition	C2			• Ganong's Review of Medical Physiology.25TH Edition.	• https://youtu.be/432AD7JZnKE

Properties of synaptic transmission	• Explain temporal and spatial summation	C1	LGIS	MCQ SEQ VIVA	Central and Peripheral Neurophysiology Section 02 (Chapter 08, Page 168) • Physiology by Linda S. Costanzo 6th Edition. Neurophysiology (Chapter 03. Page 82) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 48, Page 601,609)	https://www.osmosis.org/learn/Somatosensory_pathways
	• Enlist & explain various characteristics of synaptic transmission	C1				
Physiology of pain Dual pathway for transmission of pain Analgeia System Thermal Sensations	• Define pain	C1	LGIS	MCQ SEQ VIVA		
	• Enumerate different types of pain	C2				
	• Tabulate the differences between two types of pain	C1				
	• Describe characteristics of pain receptors	C1				
	• Discuss the mechanism of stimulation of pain receptors	C2				
	• Compare and contrast neospinothalamic & paleo spinothalamic tract	C2				
	• Define referred pain	C1				
	• Explain the mechanism of referred pain	C2				
	• Give examples of referred pain	C1				
	• Describe visceral pain and its causes	C1				
	• Define headache	C1				
	• Enlist the types of headache & their causes	C1				
	• Explain the analgesia system	C2				
	• Describe thermal receptors	C1				
	• Explain mechanism of excitation of thermal receptors	C2				

	<ul style="list-style-type: none"> Describe transmission of thermal signals in nervous system 	C1				
Sensory pathways for transmitting somatic signals	<ul style="list-style-type: none"> Classify somatic senses 	C2	LGIS	MCQ SEQ VIVA	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Central and Peripheral Neurophysiology Section 02 (Chapter 08, Page 168) Physiology by Linda S. Costanzo 6th Edition. Neurophysiology (Chapter 03. Page 82) <p>Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 48, Page 601,609)</p>	<ul style="list-style-type: none"> https://youtu.be/432AD7JZnKE https://www.osmosis.org/learn/Somatosensory_pathways
	<ul style="list-style-type: none"> Describe the sensory pathways for transmission of somatic sensations to central nervous system 	C1				
	<ul style="list-style-type: none"> Enumerate sensations carried by dorsal column system and anterolateral system 	C1				
	<ul style="list-style-type: none"> Describe the characteristics of transmission in the dorsal column medial lemniscal system and anterolateral system 	C1				
	<ul style="list-style-type: none"> Compare and contrast dorsal column medial lemniscal system and anterolateral system 	C2				
Introduction to autonomic nervous system Basic Characteristics of sympathetic & parasympathetic function	<ul style="list-style-type: none"> Describe general organization of autonomic nervous system 	C1	LGIS	MCQ SEQ VIVA	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. (Chapter 13, Page 255,259) Physiology by Linda S. Costanzo 6th Edition. Autonomic Nervous System(Chapter 02. Page 47,59) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.The Central Nervous System (Chapter 11 Page 392) <p>Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 61, Page 763,765)</p>	<ul style="list-style-type: none"> https://www.kenhub.com/en/library/anatomy/autonomic-nervous-system https://youtu.be/j9pUItHAAhs https://youtu.be/7pGKa-1tSJw https://youtu.be/gBOAYgMxq-Q
	<ul style="list-style-type: none"> Enumerate the functions of autonomic nervous system 	C1				
	<ul style="list-style-type: none"> Describe sympathetic and parasympathetic nervous system 	C1				
	<ul style="list-style-type: none"> Enumerate & explain their receptors, neurotransmitters & physiological effects 	C1				
	<ul style="list-style-type: none"> Describe physiological anatomy & effects of adrenal medulla 	C1				
	<ul style="list-style-type: none"> Explain cortical mapping & association cortex 	C2			<ul style="list-style-type: none"> Textbook of Medical 	

Somatosensory cortex & lesions of somatosensory cortex	• Describe lesions of somatosensory areas	C1	LGIS	MCQ SEQ VIVA	Physiology by Guyton & Hall.14th Edition.(Chapter 48,Page 603) https://nba.uth.tmc.edu/neuroscience/m/s2/chapter04.html	https://teachmeanatomy.info/neuroanatomy/pathways/asceding-tracts-sensory/
	• Summarize role of thalamus in somatic sensations	C1				
	• Interpret the importance of dermatomes	C3				
Excitatory & inhibitory effects of sympathetic & parasympathetic stimulation	• Briefly explain physiological actions of ANS, vasomotor tone, vagal tone & sympathetic stress response	C2	LGIS	MCQ SEQ VIVA	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition. (Chapter 13, Page 264) • Physiology by Linda S. Costanzo 6th Edition. Autonomic Nervous System(Chapter 02. Page 55) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.The Central Nervous System (Chapter 11 Page 397) <p>Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 61, Page 768)</p>	<ul style="list-style-type: none"> • https://youtu.be/7pGKa-1tSJw • https://www.kenhub.com/en/library/anatomy/autonomic-nervous-system <p>https://www.diffen.com/difference/Parasympathetic_nervous_system_vs_Sympathetic_nervous_system</p>
	• Draw a table showing autonomic effects on various body organs	C1				
	• Briefly describe the pharmacology of autonomic nervous system	C1				
CSF, Blood Brain Barrier, Blood CSF Barrier, Lumber Puncture	• Describe briefly the physiological anatomy of cerebral blood flow	C1	LGIS	MCQ SEQ VIVA	<ul style="list-style-type: none"> • Physiology by Linda S. Costanzo 6th Edition. Neurophysiology (Chapter 03. Page 113) <p>Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 62, Page 777-784)</p>	<ul style="list-style-type: none"> • https://youtu.be/f9xi1Rf5m9w <p>https://www.sciencedirect.com/topics/neuroscience/blood-cerebrospinal-fluid-barrier</p>
	• Explain cerebrospinal fluid system	C2				
	• Describe the CSF pressure, its measurement by lumbar puncture, & hydrocephalus	C1				
	• Explain blood CSF barrier & BBB	C2				
	• Describe brain edema	C1				
	• Draw association areas of brain	C1			• Textbook of Medical	https://my.clevelandclinic.org/health/a
	• Describe association areas of brain regarding their	C1				

Concept of Association areas, dominant and non-dominant cerebral hemispheres	physiological role		LGIS	MCQ SEQ VIVA	Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 58, Page 727)	rticles/23073-cerebral-cortex https://youtu.be/2Z425-CHY1c
	• Explain briefly the clinical features, if the association areas become damaged	C2				
	• Describe concept of dominant hemisphere	C1				
	• Enlist role of parieto-occipito temporal cortex in non-dominant hemisphere	C1				
Limbic system Functions of hypothalamus	• Describe the concept of limbic system	C1	LGIS	MCQ SEQ VIVA	Textbook of Medical Physiology by Guyton & Hall.14th Edition	• https://youtu.be/h3K9RfGw8sI https://www.endocrineweb.com/endocrinology/overview-hypothalamus
	• Describe physiological anatomy of limbic system	C1				
	• Enumerate and explain the roles of hippocampus, amygdala and limbic cortex	C1				
	• Describe physiological anatomy of hypothalamus	C1				
	• Enlist functions of hypothalamus	C1				
	• Explain role of hypothalamus in: <ul style="list-style-type: none"> Vegetative function Endocrine function Behavioral function Reward and punishment function 	C2				
Speech and aphasia	• Describe sensory and motor aspects of communication	C1	LGIS	MCQ SEQ VIVA	• Ganong's Review of Medical Physiology.25TH Edition. (Chapter 15, Page 290,293) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 70, Page 1211)	• https://www.sciencedirect.com/science/article/abs/pii/S0021992422000892 https://www.stroke.org.uk/what-is-aphasia/types-of-aphasia
	• Define Wernicke's aphasia, Motor aphasia & Global aphasia	C1				
	• Explain Wernicke's aphasia, Motor aphasia & Global aphasia	C2				
	• Describe function of corpus callosum & anterior commissure in transferring information between two cerebral hemispheres	C1				
	• Define memory & classify its various types	C1		MCQ	• Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 15, Page	• https://youtu.be/EqdsQDM5Fys
	• Describe role of synaptic inhibition and synaptic facilitation in memory	C1				

Learning and memory	<ul style="list-style-type: none"> • Explain mechanism of short term, intermediate and long-term memory 	C2	LGIS	SEQ VIVA	283) <ul style="list-style-type: none"> • Physiology by Linda S. Costanzo 6th Edition.(Chapter 03. Page 112) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.The Central Nervous System (Chapter 09 Page 332) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 58, Page 735)	https://www.sciencedirect.com/topics/psychology/learning-and-memory
	<ul style="list-style-type: none"> • Describe mechanism of consolidation of memory 	C1				
	<ul style="list-style-type: none"> • Enumerate specific parts of brain involved in memory 	C2				
	<ul style="list-style-type: none"> • Explain the role of each part 	C2				
Reticular activating system and sleep	<ul style="list-style-type: none"> • Describe activating driving system of the brain 	C1	LGIS	MCQ SEQ VIVA	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 14, Page 269,272,278) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Sensory Physiology (Chapter 10 Page 344) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 70, Page 12031208) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 60, Page 753)	<ul style="list-style-type: none"> • https://youtu.be/TdGQvWAZ0Cs https://www.physio-pedia.com/Reticular Formation
	<ul style="list-style-type: none"> • Explain the reticular activating system 	C2				
	<ul style="list-style-type: none"> • Discuss the control of cerebral activity by signals from brain stem 	C2				
	<ul style="list-style-type: none"> • Explain neurohormonal system of the brain 	C2				
	<ul style="list-style-type: none"> • Define sleep and enumerate types of sleep 	C1				
	<ul style="list-style-type: none"> • Compare and contrast between two types of sleep 	C2				
	<ul style="list-style-type: none"> • Describe the basic theories of sleep in detail 	C1				
	<ul style="list-style-type: none"> • Explain physiological effects of sleep 	C2				
	<ul style="list-style-type: none"> • Describe sleep and wakefulness cycle 	C1				
	<ul style="list-style-type: none"> • Describe brain waves 	C1			<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 14, Page 	https://www.webmd.com/epilepsy/guide/types-epilepsy
	<ul style="list-style-type: none"> • Enumerate different types of brain wave 	C2				
	<ul style="list-style-type: none"> • Explain the origin of different brain waves 	C2				

EEG and epilepsy	• Describe EEG	C1	LGIS	MCQ SEQ VIVA	275) • Physiology by Linda S. Costanzo 6th Edition.(Chapter 03. Page 42) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 70, Page 1209) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 60, Page 756)	https://youtu.be/T7MKIPYiL48
	• Define epilepsy	C1				
	• Enumerate various types of epilepsy	C1				
	• Explain various types of epilepsy	C2				
	• Describe role of nor-epinephrine, serotonin and	C1				
	• dopamine in psychotic disorders	C1				
	• Describe the causes, symptoms & treatment of depression & bipolar disorder	C1				
	• Discuss causes, types, symptoms and treatment of schizophrenia	C2				
	• Define Alzheimer's disease. Mention its causes, clinical features, incidence and treatment	C1				
Introduction to motor nervous system & Reflex action Conditioned reflexes & properties Properties of reflex action Control of spinal cord reflexes by higher centers	• Outline brief introduction of motor nervous system	C1	LGIS	MCQ SEQ VIVA	• Ganong's Review of Medical Physiology.25TH Edition. Section 02 • (Chapter 12, Page 237,240) • Physiology by Linda S. Costanzo 6th Edition.(Chapter 03. Page 110) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. • Section 09.(Chapter 56, Page 697)	https://www.physio-pedia.com/Extrapyr amidal_and_Pyramidal_Tracts https://youtu.be/B88BNYWVkwE
	• Give concept of cortical & subcortical motor control	C1				
	• Briefly explain UMN, LMN, anterior motor neurons & interneurons	C2				
	• Define reflex action	C1				
	• Define and draw reflex arc	C1				
	• Enumerate components of reflex arc	C1				
	• Classify the reflexes	C2				
	• Define conditioned reflex	C1				
	• Enlist and describe properties of conditioned reflexes	C1				
	• Give examples of conditioned reflex	C1				
	• Enlist and Explain properties of reflex action	C1,C2				
	• Compare & contrast spinal animal with decerebrate	C2				

	animal					
	• Describe organization of spinal cord for motor functions	C1				
	• Explain the concept of cortical & subcortical control. • Define UMN & LMN	C2				
Introduction to cerebellum Neuronal circuits of cerebellum Cerebellum and its motor functions	• Describe physiological anatomy of cerebellum	C1	LGIS	MCQ SEQ VIVA		
	• Classify the functional parts of cerebellum & mention their functions	C2				
	• Describe neuronal circuits of cerebellum in detail	C1				
	• Enumerate the afferent and efferent pathways	C1				
	• Describe the functional unit of cerebellar cortex & deep cerebellar nuclei	C1				
	• Explain the role of purkinje cell, Deep nuclear cells and inhibitory cells of cerebellum in overall functions of cerebellum	C2				
	• Explain role of climbing fibers	C2				
	• Discuss the turn-on and turn-off mechanism	C2				
	• Enlist and explain motor functions of cerebellum	C1				
	• Explain the role of vestibulo cerebellum, spino cerebellum & neocerebellum in overall motor control by cerebellum	C2				
Muscle spindle & Golgi tendon organ Role of muscle	• Describe muscle spindle & Golgi tendon organ in detail	C1	LGIS	MCQ SEQ	• Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 12, Page 229,234) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 68, Page 476)	https://www.osmosis.org/learn/Muscle_spindles_and_golgi_tendon_organs https://youtu.be/CzeAcc39Cyo
	• Explain the receptor function of the Muscle Spindle & Golgi tendon organ	C2				
	• Draw muscle spindle and Golgi tendon organ showing the sensory and motor innervation	C1				
	• Explain the dynamic and static response of	C2				

spindle and Golgi tendon organ in voluntary motor activity	muscle spindle & Golgi tendon organ			VIVA	Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 55, Page 686,691)	
	• Briefly describe muscle stretch reflex	C1				
	• Draw the neuronal circuitry of the stretch reflex	C1				
	• Explain the static and dynamic components of stretch reflex	C2				
	• Discuss the clinical applications of stretch reflex	C2				
	• Explain negative stretch reflex	C2				
	• Explain lengthening reaction and its significance	C2				
	• Describe role of muscle spindle and Golgi tendon organ in voluntary muscle activity	C1				
	• Explain the role of alpha gamma co activation	C2				
Manifestations of cerebellar disease	• Enlist and explain clinical abnormalities of cerebellum	C2	LGIS	MCQ SEQ VIVA		
Polysynaptic reflexes Transection of spinal cord Role of brain stem in controlling motor functions Lesions of motor system	• Enlist polysynaptic reflexes	C1	LGIS	MCQ SEQ VIVA		
	• Describe the polysynaptic reflexes	C1				
	• Explain mechanism of reciprocal inhibition and reciprocal innervation	C2				
	• Enlist and describe reflexes of posture and locomotion	C1				
	• Explain scratch reflex	C2				
	• Enumerate the spinal cord reflexes that cause muscle spasm	C1				
	• Enlist autonomic reflexes in the spinal cord	C1				
	• Briefly describe transection of spinal cord	C1				
	• Explain stages of complete transection	C2				
	• Briefly explain stages of complications in	C2				

	complete transection of spinal cord					
	• Describe hemi section of spinal cord	C1				
	• Explain brown-sequard syndrome	C1				
	• Enumerate and explain role of brainstem in controlling motor function	C1,C2				
	• Explain role of pontine & medullary reticular nuclei	C2				
	• Briefly write role of vestibular nuclei in antigravity muscle control	C1				
	• Summarize decerebrate rigidity	C1				
	• Enlist the effects of damage to specialized areas of motor cortex	C1				
	• Differentiate UMN Lesion and LMN Lesion	C2				
	• Explain decorticate rigidity	C2				
	• Briefly explain the pathophysiology of syringomyelia, tabs- dorsalis & poliomyelitis	C2				
Motor cortex & physiological importance of neocortex Corticospinal or pyramidal tract Extra pyramidal system	• Briefly describe motor areas in cortex	C1	LGIS	MCQ SEQ VIVA	• Ganong’s Review of Medical Physiology.25TH Edition. Section 02 (Chapter 12, Page 243) • Physiology by Linda S. Costanzo 6th Edition.(Chapter 03. Page 110) • Physiological Basis of Medical Practice by Best & Taylor’s.13th Edition. (Chapter 69, Page 1194) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section	• https://youtu.be/hxvep2Y8ShI https://www.sciencedirect.com/science/article/pii/S2214751923000026 https://teachmeanatomy.info/neuroanatomy/structures/basal-ganglia
	• Draw motor & somatic association areas of motor cortex	C1				
	• Explain functions of motor & somatic association areas	C2				
	• Explain allocortex & neocortex	C2				
	• Describe medial and lateral descending pathways	C1				
	• Explain transmission of signals from motor cortex to muscle	C2	LGIS	MCQ SEQ		
	• Draw course of pyramidal tract	C1				
	• Enlist the functions of pyramidal tract	C1				

Basal Ganglia & Lesions	• Mention the effects of lesions in Corticospinal tract	C1		VIVA	09.(Chapter 57, Page 720)	
	• Briefly describe extra pyramidal descending tracts	C1				
	• Describe rigidity and spasticity	C1				
	• Describe location and function of red nucleus	C1				
	• Describe physiological anatomy of basal ganglia	C1				
	• Draw neuronal circuits of basal ganglia	C1				
	• Explain the role of neuronal circuits in functioning of basal ganglia	C2				
	• Enlist and explain the physiological role of neurotransmitters in basal ganglia system	C1				
	• Enumerate the clinical abnormalities caused by damage to basal ganglia	C1				
	• Briefly explain Parkinson disease regarding its causes, signs and symptoms & treatment	C2				
	• Explain Huntington's Chorea regarding its causes, signs and symptoms	C2				

Topic	At The End Of This LGIS, Second Year MBBS Students Should Be Able To:	Learning Objectives	Teaching Strategy	Assessment Tools
Synapse & Sensory Receptors	• Describe the general organization of nervous system	C1	LGIS	MCQ SEQ VIVA
	• Describe major levels of CNS functions	C1		
	• Briefly explain nerve fiber structure, classification & properties	C2		
	• Describe labeled line principle	C1		
	• Define synapse	C1		
	• Enumerate & compare types of synapses	C2		
	• Describe process of synaptic transmission	C1		
	• Enumerate the important neurotransmitters of nervous system	C1		
	• Enumerate & explain different types of sensory receptors according to function	C1		MCQ
	• Enumerate & explain different types of sensory receptors according to location	C2		
	• Enlist various properties of sensory receptors	C1		
	• Describe mechanism of signal transduction & generation of receptor potential	C1		

	• Describe mechanism of adaptation of different types of receptors	C1	LGIS	SEQ VIVA
	• Describe the properties of sensory receptors	C1		
	• Describe the types and characteristics of tactile receptors	C1		
	• Briefly explain the electrical events during neuronal excitation and inhibition	C2	LGIS	MCQ SEQ VIVA
	• Explain temporal and spatial summation	C1		
	• Enlist & explain various characteristics of synaptic transmission	C1		
	• Describe visceral pain and its causes	C1		
	• Define headache	C1		
	• Enlist the types of headache & their causes	C1		
	• Explain the analgesia system	C2		
	• Describe thermal receptors	C1		
	• Explain mechanism of excitation of thermal receptors	C2		
	• Describe transmission of thermal signals in nervous system	C1		
Introduction to autonomic nervous system Basic Characteristics of sympathetic & parasympathetic function	• Describe general organization of autonomic nervous system	C1	LGIS	MCQ SEQ VIVA
	• Enumerate the functions of autonomic nervous system	C1		
	• Describe sympathetic and parasympathetic nervous system	C1		
	• Enumerate & explain their receptors, neurotransmitters & physiological effects	C1		
	• Describe physiological anatomy & effects of adrenal medulla	C1	LGIS	MCQ SEQ VIVA
	• Briefly explain physiological actions of ANS, vasomotor tone, vagal tone & sympathetic stress response	C2		
	• Draw a table showing autonomic effects on various body organs	C1		
	• Briefly describe the pharmacology of autonomic nervous system	C1		
Introduction to motor nervous system & Reflex action Conditioned reflexes & properties Properties of reflex action Control of spinal cord reflexes by higher centers	• Outline brief introduction of motor nervous system	C1	LGIS	MCQ SEQ VIVA
	• Give concept of cortical & subcortical motor control	C1		
	• Briefly explain UMN, LMN, anterior motor neurons & interneurons	C2		
	• Define reflex action	C1		
	• Define and draw reflex arc	C1		
	• Enumerate components of reflex arc	C1		
	• Classify the reflexes	C2		
	• Define conditioned reflex	C1		
	• Enlist and describe properties of conditioned reflexes	C1		

	• Give examples of conditioned reflex	C1		
	• Enlist and Explain properties of reflex action	C1,C2		
	• Compare & contrast spinal animal with decerebrate animal	C2		
	• Describe organization of spinal cord for motor functions	C1		
	• Explain the concept of cortical & subcortical control.	C2		
	• Define UMN & LMN			
Introduction to cerebellum Neuronal circuits of cerebellum Cerebellum and its motor functions	• Describe physiological anatomy of cerebellum	C1	LGIS	MCQ SEQ VIVA
	• Classify the functional parts of cerebellum & mention their functions	C2		
	• Describe neuronal circuits of cerebellum in detail	C1		
	• Enumerate the afferent and efferent pathways	C1		
	• Describe the functional unit of cerebellar cortex & deep cerebellar nuclei	C1		
	• Explain the role of purkinje cell, Deep nuclear cells and inhibitory cells of cerebellum in overall functions of cerebellum	C2		
	• Explain role of climbing fibers	C2		
	• Discuss the turn-on and turn-off mechanism	C2		
	• Enlist and explain motor functions of cerebellum	C1		
	• Explain the role of vestibulo cerebellum, spino cerebellum & neocerebellum in overall motor control by cerebellum	C2		
Muscle spindle & Golgi tendon organ Role of muscle spindle and Golgi tendon organ in voluntary motor activity	• Describe muscle spindle & Golgi tendon organ in detail	C1	LGIS	MCQ SEQ VIVA
	• Explain the receptor function of the Muscle Spindle & Golgi tendon organ	C2		
	• Draw muscle spindle and Golgi tendon organ showing the sensory and motor innervation	C1		
	• Explain the dynamic and static response of muscle spindle & Golgi tendon organ	C2		
	• Briefly describe muscle stretch reflex	C1		
	• Draw the neuronal circuitry of the stretch reflex	C1		
	• Explain the static and dynamic components of stretch reflex	C2		
	• Discuss the clinical applications of stretch reflex	C2		
	• Explain negative stretch reflex	C2		
	• Explain lengthening reaction and its significance	C2		
	• Describe role of muscle spindle and Golgi tendon organ in voluntary muscle activity	C1		
	• Explain the role of alpha gamma co activation	C2		
	• Enlist polysynaptic reflexes	C1		
	• Describe the polysynaptic reflexes	C1		

	• Explain mechanism of reciprocal inhibition and reciprocal innervation	C2	LGIS	MCQ SEQ VIVA
	• Enlist and describe reflexes of posture and locomotion	C1		
	• Explain scratch reflex	C2		
	• Enumerate the spinal cord reflexes that cause muscle spasm	C1		
	• Enlist autonomic reflexes in the spinal cord	C1		
	• Briefly describe transection of spinal cord	C1		
	• Explain stages of complete transection	C2		
	• Briefly explain stages of complications in complete transection of spinal cord	C2		
	• Describe hemisection of spinal cord	C1		
	• Explain Brown-Sequard syndrome	C1		
	• Enumerate and explain role of brainstem in controlling motor function	C1,C2		
	• Explain role of pontine & medullary reticular nuclei	C2		
	• Briefly write role of vestibular nuclei in antigravity muscle control	C1		
	• Summarize decerebrate rigidity	C1		
	• Enlist the effects of damage to specialized areas of motor cortex	C1		
	• Differentiate UMN Lesion and LMN Lesion	C2		
	• Explain decorticate rigidity	C2		
	• Briefly explain the pathophysiology of syringomyelia, tabes dorsalis & poliomyelitis	C2		
Motor cortex & physiological importance of neocortex Corticospinal or pyramidal tract Extra pyramidal system Basal Ganglia & Lesions	• Briefly describe motor areas in cortex	C1	LGIS	MCQ SEQ VIVA
	• Draw motor & somatic association areas of motor cortex	C1		
	• Explain functions of motor & somatic association areas	C2		
	• Explain allocortex & neocortex	C2		
	• Describe medial and lateral descending pathways	C1		
	• Explain transmission of signals from motor cortex to muscle	C2	LGIS	MCQ SEQ VIVA
	• Draw course of pyramidal tract	C1		
	• Enlist the functions of pyramidal tract	C1		
	• Mention the effects of lesions in Corticospinal tract	C1		
	• Briefly describe extra pyramidal descending tracts	C1		
	• Describe rigidity and spasticity	C1		
	• Describe location and function of red nucleus	C1		
	• Describe physiological anatomy of basal ganglia	C1		
	• Draw neuronal circuits of basal ganglia	C1		
	• Explain the role of neuronal circuits in functioning of basal ganglia	C2		
	• Enlist and explain the physiological role of neurotransmitters in basal ganglia system	C1		
	• Enumerate the clinical abnormalities caused by damage to basal ganglia	C1		
	• Briefly explain Parkinson disease regarding its causes, signs and symptoms &	C2		

Limbic system Functions of hypothalamus	treatment			
	• Explain Huntington's Chorea regarding its causes, signs and symptoms	C2		
	• Describe the concept of limbic system	C1		
	• Describe physiological anatomy of limbic system	C1		
	• Enumerate and explain the roles of hippocampus, amygdala and limbic cortex	C1		
	• Describe physiological anatomy of hypothalamus	C1		
	• Enlist functions of hypothalamus	C1		
	• Explain role of hypothalamus in: <ul style="list-style-type: none"> ○ Vegetative function ○ Endocrine function Behavioral function • Reward and punishment function	C2		

Topics	Learning objectives	Learning Resources
Pathways for transmitting somatic signals	<ul style="list-style-type: none"> • Classify somatic senses • Describe the sensory pathways for transmission of somatic sensations to central nervous system. • Enumerate sensations carried by dorsal column system and anterolateral system • Describe the characteristics of transmission in the dorsal column medial lemniscal system and anterolateral system • Compare and contrast dorsal column medial lemniscal system and anterolateral system 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition. Central and Peripheral Neurophysiology Section 02 (Chapter 08, Page 168) • Physiology by Linda S. Costanzo 6th Edition. Neurophysiology (Chapter 03. Page 82) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 48, Page 601,609) • https://youtu.be/432AD7JZnKE • https://www.osmosis.org/learn/Somatosensory_pathways
Somatosensory cortex & lesions of Somatosensory cortex	<ul style="list-style-type: none"> • Explain cortical mapping & association cortex • Describe lesions of somatosensory areas • Summarize role of thalamus in somatic sensations • Interpret the importance of dermatomes 	<ul style="list-style-type: none"> • Textbook of Medical Physiology by Guyton & Hall.14th Edition.(Chapter 48,Page 603) • https://nba.uth.tmc.edu/neuroscience/m/s2/chapter04.html • https://teachmeanatomy.info/neuroanatomy/pathways/asending-tracts-sensory/
	<ul style="list-style-type: none"> • Describe general organization of autonomic nervous system • Enumerate the functions of autonomic nervous system • Describe sympathetic and parasympathetic nervous system • Enumerate & explain their receptors, neurotransmitters & physiological effects • Describe physiological anatomy & effects of adrenal medulla 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition. (Chapter 13, Page 255,259) • Physiology by Linda S. Costanzo 6th Edition. Autonomic Nervous System(Chapter 02. Page 47,59)

Introduction to autonomic nervous system Basic Characteristics of sympathetic & parasympathetic function		<ul style="list-style-type: none"> Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.The Central Nervous System (Chapter 11 Page 392) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 61, Page 763,765) https://www.kenhub.com/en/library/anatomy/autonomic-nervous-system https://youtu.be/j9pUItHAAhs 7 https://youtu.be/7pGKa-1tSJw https://youtu.be/gBOAYgMxq-Q
Excitatory & inhibitory effects of sympathetic & parasympathetic stimulation	<ul style="list-style-type: none"> Briefly explain physiological actions of ANS, vasomotor tone, vagal tone & sympathetic stress response Draw a table showing autonomic effects on various body organs Briefly describe the pharmacology of autonomic nervous system 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. (Chapter 13, Page 264) Physiology by Linda S. Costanzo 6th Edition. Autonomic Nervous System(Chapter 02. Page 55) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.The Central Nervous System (Chapter 11 Page 397) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 61, Page 768) https://youtu.be/7pGKa-1tSJw https://www.kenhub.com/en/library/anatomy/autonomic-nervous-system https://www.diffen.com/difference/Parasympathetic_nervous_system_vs_Sympathetic_nervous_system
Blood brain barrier, Blood CSF Barrier, Lumber puncture	<ul style="list-style-type: none"> Describe briefly the physiological anatomy of cerebral blood flow Explain cerebrospinal fluid system Describe the CSF pressure, its measurement by lumbar puncture, & hydrocephalus Explain blood CSF barrier & BBB Describe brain edema 	<ul style="list-style-type: none"> Physiology by Linda S. Costanzo 6th Edition. Neurophysiology (Chapter 03. Page 113) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 62, Page 777-784) https://youtu.be/f9xi1Rf5m9w https://www.sciencedirect.com/topics/neuroscience/blood-cerebrospinal-fluid-barrier

Limbic system, Functions of hypothalamus	<ul style="list-style-type: none"> Describe the concept of limbic system 	<ul style="list-style-type: none"> Textbook of Medical Physiology by Guyton & Hall.14th Edition https://youtu.be/h3K9RfGw8sI https://www.endocrineweb.com/endocrinology/overview-hypothalamus
Learning and memory	<ul style="list-style-type: none"> Define memory & classify its various types Describe role of synaptic inhibition and synaptic facilitation in memory Explain mechanism of short term, intermediate and long-term memory Describe mechanism of consolidation of memory Enumerate specific parts of brain involved in memory Explain the role of each part 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 15, Page 283) Physiology by Linda S. Costanzo 6th Edition.(Chapter 03. Page 112) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.The Central Nervous System (Chapter 09 Page 332) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 58, Page 735) https://youtu.be/EqdsQDM5Fys https://www.sciencedirect.com/topics/psychology/learning-and-memory
Concept of Association areas, Concept of Dominant and non-dominant cerebral hemispheres	<ul style="list-style-type: none"> Draw association areas of brain Describe association areas of brain regarding their physiological role Explain briefly the clinical features, if the association areas become damaged Describe concept of dominant hemisphere Enlist role of parietooccipito temporal cortex in non-dominant hemisphere 	<ul style="list-style-type: none"> Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 58, Page 727) https://my.clevelandclinic.org/health/articles/23073-cerebral-cortex https://youtu.be/2Z425-CHY1c
Speech and aphasia	<ul style="list-style-type: none"> Describe sensory and motor aspects of communication Define Wernicke's aphasia, Motor aphasia & Global aphasia Explain Wernicke's aphasia, Motor aphasia & Global aphasia Describe function of corpus callosum & anterior commissure in transferring information between two cerebral hemispheres 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. (Chapter 15, Page 290,293) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 70, Page 1211) https://www.sciencedirect.com/science/article/abs/pii/S0021992422000892 https://www.stroke.org.uk/what-is-aphasia/types-of-aphasia
	<ul style="list-style-type: none"> Describe brain waves Enumerate different types of brain wave Explain the origin of different brain waves Describe EEG Define epilepsy 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 14, Page 275) Physiology by Linda S. Costanzo 6th Edition.(Chapter 03. Page 42) Physiological Basis of Medical Practice by Best &

EEG and epilepsy	<ul style="list-style-type: none"> Enumerate various types of epilepsy Explain various types of epilepsy Describe role of norepinephrine, serotonin and dopamine in psychotic disorders Describe the causes, symptoms & treatment of depression & bipolar disorder Discuss causes, types, symptoms and treatment of Schizophrenia Define Alzheimer's disease. Mention its causes, clinical features, incidence and treatment 	<ul style="list-style-type: none"> Taylor's.13th Edition. (Chapter 70, Page 1209) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 60, Page 756) https://www.webmd.com/epilepsy/guide/types-epilepsy https://youtu.be/T7MKIPYiL48
Reticular activating system and sleep	<ul style="list-style-type: none"> Describe activating driving system of the brain Explain the reticular activating system Discuss the control of cerebral activity by signals from brain stem Explain neurohormonal system of the brain Define sleep and enumerate types of sleep Compare and contrast between two types of sleep Describe the basic theories of sleep in detail Explain physiological effects of sleep Describe sleep and wakefulness cycle 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 14, Page 269,272,278) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10 Page 344) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 70, Page 12031208) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 60, Page 753) https://youtu.be/TdGQvWAZ0Cs https://www.physio-pedia.com/Reticular Formation
Muscle spindle & Golgi tendon organ, Role of muscle spindle and Golgi tendon organ in voluntary motor activity	<ul style="list-style-type: none"> Describe muscle spindle & Golgi tendon organ in detail Explain the receptor function of the Muscle Spindle & Golgi tendon organ Draw muscle spindle and Golgi tendon organ showing the sensory and motor innervation Explain the dynamic and static response of muscle spindle & Golgi tendon organ Briefly describe muscle stretch reflex Draw the neuronal circuitry of the stretch reflex Explain the static and dynamic components of stretch reflex Discuss the clinical applications of stretch reflex Explain negative stretch reflex Explain lengthening reaction and its significance Describe role of muscle spindle and Golgi tendon organ in voluntary muscle activity Explain the role of alpha gamma co activation 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 12, Page 229,234) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 68, Page 476) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 55, Page 686,691) https://www.osmosis.org/learn/Muscle_spindles_and_golgi_tendon_organ https://youtu.be/CzeAcc39Cyo

Motor cortex & physiological importance of neocortex, Corticospinal or pyramidal tract, Extra pyramidal system	<ul style="list-style-type: none"> Briefly describe motor areas in cortex Draw motor & somatic association areas of motor cortex Explain functions of motor & somatic association areas Explain allocortex & neocortex Describe medial and lateral descending pathways Explain transmission of signals from motor cortex to muscle Draw course of pyramidal tract Enlist the functions of pyramidal tract Mention the effects of lesions in Corticospinal tract Briefly describe extra pyramidal descending tracts Describe rigidity and spasticity Describe location and function of red nucleus 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 12, Page 237,240) Physiology by Linda S. Costanzo 6th Edition.(Chapter 03. Page 110) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 56, Page 697) https://www.physio-pedia.com/Extrapyramidal_and_Pyramidal_Tracts https://youtu.be/B88BNYWVkJWE
Basal Ganglia & Lesions	<ul style="list-style-type: none"> Describe physiological anatomy of basal ganglia Draw neuronal circuits of basal ganglia Explain the role of neuronal circuits in functioning of basal ganglia Enlist and explain the physiological role of neurotransmitters in basal ganglia system Enumerate the clinical abnormalities caused by damage to basal ganglia Briefly explain Parkinson disease regarding its causes, signs and symptoms & treatment Explain Huntington's Chorea regarding its causes, signs and symptoms 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 12, Page 243) Physiology by Linda S. Costanzo 6th Edition.(Chapter 03. Page 110) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 69, Page 1194) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 09.(Chapter 57, Page 720) https://youtu.be/hxvep2Y8ShI https://www.sciencedirect.com/science/article/pii/S2214751923000026 https://teachmeanatomy.info/neuroanatomy/structures/basal-ganglia/

Practicals

Practical	At The End Of This Skill Lab, Should Be Able To Illustrate:	Learning Domain	Teaching Strategy	Assessment Tools	References
	• Apparatus identification	C1	Skill lab	OSPE	
	• Principle	C1			
	• Procedure	A, P			

Examination of sensory nervous system	• Precautions	P			Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail
	• Recall sensations transmitted by sensory pathways	C1			
	• Recall the effects of lesions of these pathways	C1			
Examination of motor nervous system	• Apparatus identification	C1	Skill lab	OSPE	Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail
	• Principle	C1			
	• Procedure	A,P			
	• Precautions	P			
	• Recall descending pathways & their functions	C1			
	• Recall effects of lesions of these pathways	C1			
Examination of cerebellar System	• Apparatus identification	C1	Skill lab	OSPE	Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail
	• Principle	C1			
	• Procedure	A,P			
	• Precautions	P			
	• Recall functions of cerebellum & effects of lesions of cerebellum/	C3			
Ophthalmoscopy	• Apparatus identification	C1	Skill lab	OSPE	Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail
	• Principle	C1			
	• Procedure	A,P			
	• Precautions	P			
	• Clinical Correlation	C1			
Determination of Eye field	• Apparatus identification	C1	Skill lab	OSPE	Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail
	• Principle	C1			
	• Procedure	A,P			
	• Precautions	P			

	<ul style="list-style-type: none"> Clinical Correlation 	C3			
Recording of body temperature	<ul style="list-style-type: none"> Apparatus identification 	C1	Skill lab	OSPE	Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail
	<ul style="list-style-type: none"> Principle 	C1			
	<ul style="list-style-type: none"> Procedure 	A,P			
	<ul style="list-style-type: none"> Precautions 	P			
	<ul style="list-style-type: none"> Record oral, axillary & rectal temperature 	C1			
	<ul style="list-style-type: none"> Recall abnormalities of body temperature 	C1			
Examination of superficial & deep reflexes	<ul style="list-style-type: none"> Apparatus identification 	C1	Skill lab	OSPE	Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail
	<ul style="list-style-type: none"> Principle 	C1			
	<ul style="list-style-type: none"> Procedure 	A,P			
	<ul style="list-style-type: none"> Precautions 	P			
	<ul style="list-style-type: none"> Recall reflex arc 	C1			
	<ul style="list-style-type: none"> Recall effects of UMNL & LMNL on reflexes 	C1			
Examination of 3 rd , 4 th & 6 th cranial nerves	<ul style="list-style-type: none"> Apparatus identification 	C1	Skill lab	OSPE	Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail
	<ul style="list-style-type: none"> Principle 	C1			
	<ul style="list-style-type: none"> Procedure 	A,P			
	<ul style="list-style-type: none"> Precautions 	P			
	<ul style="list-style-type: none"> Recall functions & pathways of various cranial nerves 	C1			
	<ul style="list-style-type: none"> Recall effects of lesions of cranial nerves 	C1			
Examination of 5 th , & 7 th cranial nerves / Examination of 8 th , 9 th , 10, 11 th , 12 th cranial nerves	<ul style="list-style-type: none"> Apparatus identification 	C1	Skill lab	OSPE	Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail

Biochemistry				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	C/P/A	Teaching Strategy	Assessment Tool
Triglyceride Metabolism, Fatty acid transport	• Describe synthesis & breakdown of TAGs and factors affecting it	C2	LGIS	MCQs
	• Explain entry of fatty acid into mitochondria (carnitine shuttle)	C2		SAQs Viva
Oxidation of fatty acid	• Describe steps, enzymes, energy calculations of β - oxidation of saturated fatty acid (Odd + Even)	C2	LGIS	MCQs SAQs Viva
Oxidation of fatty acid	• Discuss other types of oxidations and related disorders	C2	LGIS	MCQs SAQs Viva
Fatty acid synthesis	• Explain the steps, regulation and related diseases of fatty acid synthesis	C2	LGIS	MCQs SAQs Viva
Cholesterol Synthesis	• Describe the steps, regulation and related disorders of Cholesterol Synthesis	C2	LGIS	MCQs SAQs Viva
Plasma Cholesterol level	• Recall normal Plasma Cholesterol level and factors controlling it	C1	LGIS	MCQs SAQs Viva
Ketone bodies metabolism	• Explain the synthesis and breakdown of Ketone bodies with related diseases (ketoacidosis)	C2	LGIS	MCQs SAQs Viva

Metabolism of Glycerophospholipid	<ul style="list-style-type: none"> Describe the steps of biosynthesis of Glycerophospholipids with its regulation and clinical significance 	C2	LGIS	MCQs SAQs Viva
Metabolism of Sphingophospholipids	<ul style="list-style-type: none"> Explain the steps of biosynthesis of sphingophospholipids with its regulation and clinical significance 	C2	LGIS	MCQs SAQs Viva
Introduction to Lipoproteins	<ul style="list-style-type: none"> Discuss the functions and roll of Lipoproteins & apolipoprotein 	C2	LGIS	MCQs SAQs Viva

LDL& HDL	<ul style="list-style-type: none"> Explain the composition, functions and clinical significance of LDL& HDL 	C2	LGIS	MCQs SAQs Viva
	<ul style="list-style-type: none"> Illustrate the mechanism of reverse cholesterol transport 	C3		
Disorders of lipoprotein metabolism	<ul style="list-style-type: none"> Classify and explain the disorders of lipoprotein metabolism. (hyper & hypo lipoproteinemia) 	C2	LGIS	MCQs SAQs Viva
Fatty Liver & Adipose Tissue	<ul style="list-style-type: none"> Interpret conditions leading to Fatty liver 	C3	LGIS	MCQs SAQs Viva
	<ul style="list-style-type: none"> Describe metabolism of adipose tissue & Brown fat 	C2		
Disorders of lipoprotein metabolism	<ul style="list-style-type: none"> Classify and explain the disorders of lipoprotein metabolism. (hyper & hypo lipoproteinemia) 	C2	LGIS	MCQs SAQs Viva

Topics	Learning objectives	Learning Resources
Chylomicron metabolism	<ul style="list-style-type: none"> Describe synthesis of chylomicron, its breakdown and factors affecting it 	<ul style="list-style-type: none"> Lippincott Biochemistry Chapter. 18 page 253 https://www.ncbi.nlm.nih.gov/books/NBK305896/
HDL & LDL metabolism	<ul style="list-style-type: none"> Explain composition functions and clinical significance of LDL & HDL Illustrate mechanism of revise cholesterol synthesis 	<ul style="list-style-type: none"> Lippincott Biochemistry Chapter. 18 page 253 https://www.alilamedicalmedia.com/-/g...

Fatty acid oxidation	<ul style="list-style-type: none">Describe steps enzymes energy calculation of Beta oxidation of saturated fatty acid	<ul style="list-style-type: none">Lippincott Biochemistry Chapter. 16 page 213https://ninjanerd.org			
Synthesis &Interconversion of Ketone Bodies, Regulation of Ketogenesis, Ketolysis	<ul style="list-style-type: none">Explain synthesis and breakdown of ketone bodies and related disorders	<ul style="list-style-type: none">Lippincott Biochemistry Chapter. 27 page 411https://youtu.be/GuSqOsm3QV8			
Synthesis of Cholesterol and its regulation	<ul style="list-style-type: none">Describe steps regulation and related disorders of cholesterol synthesis	<ul style="list-style-type: none">Lippincott Biochemistry Chapter. 18 page 244https://youtu.be/y9zsDFdMvZY			
	<ul style="list-style-type: none">Principle	C1			
	<ul style="list-style-type: none">Procedure	A,P			
	<ul style="list-style-type: none">Precautions	P			
	<ul style="list-style-type: none">Recall functions & pathways of various cranial nerves	C1			
	<ul style="list-style-type: none">Recall effects of lesions of cranial nerves	C1			

Topic	At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Color Test For Sterols	Perform Color test four sterols	P	Skill Lab	OSPE
Detection of Cholesterol Crystals	Perform cholesterol Crystals Deduction Test.	P	Skill Lab	OSPE
Estimation of serum TAGS	Perform triglyceride estimation	P	Skill Lab	OSPE
Estimation of Serum HDL	Perform HDL Estimation	P	Skill Lab	OSPE
Lipid Solubility & Acrolein test	Perform Lipid Solubility & Acrolein test.	P	Skill Lab	OSPE

Basic and Clinical Sciences (Vertical Integration)

Anatomy, Physiology & Biochemistry			
Clinical Themes			
Subject	Topic	At the End Of Lecture Students Should Be Able To	Learning Domain
Anatomy	• Cystic Astrocytoma of cerebellum	Apply basic knowledge of subject to study clinical case.	C3
	• Stroke	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• CVA	Apply basic knowledge of subject to study clinical case.	C3
	• Gullain Barr syndrome	Apply basic knowledge of subject to study clinical case.	C3
Biochemistry	• IHD	Apply basic knowledge of subject to study clinical case.	C3
	• Respiratory Distress Syndrome	Apply basic knowledge of subject to study clinical case.	C3

Pathology				
Theory				
Topic	At the end of this LGIS students of should be able to:	Learning Domain	Teaching Strategy	Assessment Tool
Patterns of injury in nervous system	• Describe edema ,herniation and hydrocephalous	C2	LGIS	MCQ'S
	• Classify cerebrovascular diseases	C2		
	• Explain CNS trauma	C2		
	• Identify Congenital malformation	C1		
Diseases of myelin and neurodegenerative diseases	Students should be able to • describe the pathophysiology and histomorphology of Alzheimer's disease, Parkinson's Disease, Huntington's disease and Multiple sclerosis	C2	LGIS	MCQ'S
Meningitis	• Classify types of meningitis	C2	LGIS	MCQ'S
	• Enlist causes of meningitis	C1		
	• Describe lab diagnosis of meningitis	C2		
	• Enlist complication of meningitis	C2		

Pharmacology				
Theory				
Topic	At the end of this LGIS students of should be able to:	Learning Domain	Teaching Strategy	Assessment Tool
Introduction to CNS Pharmacology	<ul style="list-style-type: none"> List the major neurotransmitters in the CNS 	C1	LGIS	MCQ
	<ul style="list-style-type: none"> List the major classes of receptors for each of the primary neurotransmitters and their associated relevant disorders 	C1		
	<ul style="list-style-type: none"> Identify the special considerations associated with CNS drug delivery 	C1		
	<ul style="list-style-type: none"> Cite main drug groups acting on the CNS 	C1		

Medicine				
Theory				
Topic	At The End Of This Skill Lab, Should Be Able To Illustrate:	Learning Domain	Teaching Strategy	Assessment Tools
Stroke	<ul style="list-style-type: none"> Discuss pathophysiology, Blood supply of brain (Anterior and posterior Circulation), which part of brain supplied by various arteries, Physiology of brain pathways (Corticospinal and Corticobulbar pathways), Types of Stroke, clinical features, management 	C1 C2	LGIS	MCQs
Spinal Cord and Peripheral Nervous system	<ul style="list-style-type: none"> Various types of pathways and cells, Peripheral Nerves and neuromuscular junction, difference between upper and lower motor neurons, various types of Plegias (Paraplegia, Hemiplegia, Quadriplegia), Various types of neuropathies and myasthenia Gravis and discuss pathophysiology 	C1 C2	LGIS	MCQs
Cerebellar Disorders	<ul style="list-style-type: none"> Brain parts involved in Movement and Co-ordination, how movements are brought about, possible lesions and discuss pathophysiology, types of disorders, clinical features, management 	C1 C2	LGIS	MCQs
Meningitis	<ul style="list-style-type: none"> Define and discuss pathophysiology and discuss symptoms and signs 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Discuss the causes 	C2		
	<ul style="list-style-type: none"> Describe the management 	C2		
Epilepsy and other convulsive disorders	<ul style="list-style-type: none"> Define and discuss pathophysiology 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Discuss the causes 	C2		

	<ul style="list-style-type: none">• Describe the management	C2		
Encephalitis	<ul style="list-style-type: none">• Define and discuss and discuss pathophysiology, symptoms and signs	C1	LGIS	MCQs
	<ul style="list-style-type: none">• Discuss the causes	C2		
	<ul style="list-style-type: none">• Describe the management	C2		

Surgery				
Theory				
Topic	At The End Of This LGIS, Second Year MBBS Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Brain tumors	<ul style="list-style-type: none">• Classify Brain Tumors	C1	LGIS	MCQ
	<ul style="list-style-type: none">• Outline clinical features of brain tumors.• Approach towards a SOL brain	C1		
Brain abscess	<ul style="list-style-type: none">• Define Brain Abscess	C1	LGIS	MCQ
	<ul style="list-style-type: none">• Outline clinical features of brain abscess	C1		
Head injury	<ul style="list-style-type: none">• Define head injury	C1	LGIS	MCQ
	<ul style="list-style-type: none">• Mechanism of Head injury	C1		
	<ul style="list-style-type: none">• Clinical features of head injury	C1		
	<ul style="list-style-type: none">• Glassgow coma Scale	C1		
Poly trauma Patient	<ul style="list-style-type: none">• Define polytrauma	C1	LGIS	MCQ
	<ul style="list-style-type: none">• Describe triage	C1		
	<ul style="list-style-type: none">• ATLS Protocol	C1		

Obstetrics & Gynecology				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Seizures during pregnancy(eclampsia/e pilepsy)	<ul style="list-style-type: none"> Enumerate common neurological disorders during pregnancy (eclampsia, epilepsy) 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Understand neurological changes leading to eclampsia and epilepsy 	C1		
	<ul style="list-style-type: none"> Understand the effects of epilepsy and anti-epileptic drugs on mother and fetus 	C1		
	<ul style="list-style-type: none"> Comprehend the principles of management of epilepsy during pregnancy 	C1		

Pediatrics				
Theory				
Topic	At The End Of This Skill Lab, Should Be Able To Illustrate:	Learning Domain	Teaching Strategy	Assessment Tools
Meningitis	Scenario of a patient with fever & fits		LGIS	MCQs
	<ul style="list-style-type: none"> Define meningitis. 	C1		
	<ul style="list-style-type: none"> Discuss Epidemiology &Pathophysiology 	C1		
	<ul style="list-style-type: none"> Discuss Etiological organisms at different ages 	C1		
	<ul style="list-style-type: none"> Discuss Clinical features 	C1		
	<ul style="list-style-type: none"> Discuss Diagnosis & Management 	C1		
	<ul style="list-style-type: none"> Discuss Complications & prognosis 	C1		
	<ul style="list-style-type: none"> Discuss Prevention of meningitis 	C1		
	<ul style="list-style-type: none"> Scenario of a Cerebral Palsy patient 			
	<ul style="list-style-type: none"> Student will be able to know 			
	<ul style="list-style-type: none"> Discus Brief anatomy of brain 	C2		

Cerebral Palsy	<ul style="list-style-type: none"> • Definition of cerebral palsy 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> • Discuss Epidemiology 	C2		
	<ul style="list-style-type: none"> • Discuss Etiology 	C2		
	<ul style="list-style-type: none"> • Discuss Pathophysiology 	C2		
	<ul style="list-style-type: none"> • Discuss Clinical presentation & anatomic classification of Cerebral Palsy 	C2		
	<ul style="list-style-type: none"> • Discuss Associated problems 	C2		
	<ul style="list-style-type: none"> • Discuss Management & Prevention 	C2		
Polio	<ul style="list-style-type: none"> • Scenario of a patient with acute flaccid paralysis 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> • Student will be able to know 	C1		
	<ul style="list-style-type: none"> • AFP definition 	C1		
	<ul style="list-style-type: none"> • Discuss Etiology & Epidemiology of Polio 	C2		
	<ul style="list-style-type: none"> • Discuss Pathogenesis 	C2		
	<ul style="list-style-type: none"> • Discuss Clinical features 	C2		
	<ul style="list-style-type: none"> • Discuss Management 	C2		
	<ul style="list-style-type: none"> • Discuss Complications & sequel 	C2		
	<ul style="list-style-type: none"> • Prevention – vaccination 	C1		

Radiology				
Theory				
Practical	At The End Of This Skill Lab, Should Be Able To Illustrate:	Learning Domain	Teaching Strategy	Assessment Tools
Skull radio graph	<ul style="list-style-type: none"> • Interprat Normal Skull Radiograph 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> • Discuss fractures and other diseases with their clinical significance 	C2		
CT- scan brain	<ul style="list-style-type: none"> • Interpret normal anatomical structures 	C2	LGIS	MCQs
MRI & CT Scan	<ul style="list-style-type: none"> • List some indications for contrast enhanced MRI and CT 	C1	LGIS	MCQs
CT scan	<ul style="list-style-type: none"> • Discriminate between a subdural and epidural hematoma at CT (4) Describe imaging signs of a subarachnoid hemorrhage 	C2	LGIS	MCQs

ENT				
Theory				
Topic	At The End Of This LGIS, Second Year MBBS Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Acoustic neuroma	<ul style="list-style-type: none"> Recognize signs and symptoms of acoustic neuroma 	C1	LGIS	MCQs

Ophthalmology				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Chalazion	<ul style="list-style-type: none"> Discuss in detail the clinical features and management 	C2	LGIS	MCQs
Strabismus	<ul style="list-style-type: none"> Discuss in detail the clinical features and management 	C2	LGIS	MCQs

List of CNS Module Vertical Courses Lectures					
Date/Day	Department	Time	Week	Topic Of Lectures	Teachers
29-07-2024 Monday	Pharmacology (LGIS)	11:20AM – 12:10 PM	1 st Week	Introduction to CNS pharmacology	Dr. Omaina Asif (Even)
					Dr Arsheen (Odd)
02-08-2024 Friday	Pediatrics (LGIS)	08:00AM – 09:00 AM	1 st Week	Meningitis	Dr. Mamoonah Qudrat (Even)
					Dr. Tanzeela Rani (Odd)
03-08-2024 Saturday	Pathology (LGIS)	10:30AM – 11:20 AM	1 st Week	Introduction to ANS ,Basic Characteristics of Sympathetic & Parasympathetic System	Dr. Nida Fatima (Even)
				Meningitis	Dr. Kiran Ahmad (Odd)
05-08-2024	Pathology (LGIS)	11:20AM - 12:10 PM	2 nd Week	Patterns of injury in nervous system	Dr. Nida Fatima (Even)

Monday					Dr Kiran Ahmad (Odd)
07-08-2024	Surgery (LGIS)	11:20AM - 12:10 PM	2 nd Week	Spinal injury and Head injury	Dr. Soban Sarwar Gondal (Even)
Wednesday					Dr. Usman Malik (Odd)
08-08-2024	Radiology (LGIS)	10:30AM – 11:20 AM	2 nd Week	Skull Radiograph	Dr Riffat (Even)
Thursday					Dr Saba (Odd)
09-08-2024	Medicine (LGIS)	08:00AM – 09:00 AM	2 nd Week	Spinal cord and peripheral nervous system	Dr Javeria Malik (Even)
Friday					Dr Riffat (Odd)
10-08-2024	Gynecology &OBS (LGIS)	11:00AM – 12:10 PM	2 nd Week	Seizures during pregnancy(eclampsia/epilepsy)	Dr Ismat Batool (Even)
Saturday					Dr Sadia Waheed (Odd)
17-08-2024	Medicine (LGIS)	11:20AM – 12:10 PM	3 rd Week	Cerebellar disorders	Dr Javeria Malik (Even)
Saturday					Dr Faran Maqbool (Odd)
19-08-2024	Surgery (LGIS)	10:30AM – 11:20 AM	4 th Week	Management of hydrocephalus	Dr. Fraz Mehmood (Even)
Monday					Dr. Ammad ul Haq (Odd)
19-08-2024	Medicine (LGIS)	11:20AM – 12:10 PM	4 th Week	Epilepsy and other convulsive disorders	Dr Javeria Malik (Even)
Monday					Dr Faran Maqbool (Odd)
21-08-2024	Medicine (LGIS)	11:20AM – 12:10 PM	4 th Week	Encephalitis	Dr Javeria Malik (Even)
Wednesday					Dr Faran Maqbool (Odd)
26-08-2024	Medicine (LGIS)	10:30AM – 11:20 AM	5 th Week	Stroke	Dr Javeria Malik (Even)
Monday					Dr Faran Maqbool (Odd)
28-08-2024	Radiology	10:30AM - 11:20 AM	5 th Week	CT scan and MRI (Brain and Spinal Cord)	Dr Anum Zahoor (Even)
Wednesday					Dr Faisal (Odd)
28-08-2024	Surgery (LGIS)	11:20AM – 12:10 PM	5 th Week	Poly trauma patient	Dr. Fraz Mehmood (Even)
Wednesday					Dr. Ali Tasaddaq (Odd)

Spirally Integrated Courses / General Education Cluster (GEC) Courses

Content

- **Longitudinal Themes**
 - **The Holy Quran Translation**
 - **Pak Studies/Islamiyat**
 - **Family Medicine**
 - **Behavioral Sciences**
 - **Biomedical Ethics**
 - **Early Clinical Exposure (ECE)**
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Behavioral Sciences				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Emotions	<ul style="list-style-type: none"> To be able to define emotions. 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> To understand the neuroanatomy and neurochemistry of emotion way to deal with emotion 	C2		
Memory	<ul style="list-style-type: none"> To be able to outline the types of memory. 	C2	LGIS	MCQs
	<ul style="list-style-type: none"> To be able to explain the areas in brain responsible for memory storage and Retrieval 	C2		

Biomedical Ethics				
Theory				
Topics	At the end of session students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Ethical dilemmas in healthcare practice involving breach in principle of autonomy	<ul style="list-style-type: none"> Analyze ethical dilemmas in healthcare practice involving breach in principle of autonomy. Explain what procedures adopted to maintain patient autonomy. Identify situations in which doctor may have to take decisions in the best interest of the patients 	C3 C2 C1	Short video demonstration on violation of Ethical principle of autonomy from suit CBEC Video resources	<ul style="list-style-type: none"> Assignment based assessment involving real life case scenarios under aggregate Marks. (Internal Assessment) Assignment to be uploaded on LMS
Ethical dilemmas in healthcare practice involving breach in principle of beneficence and non-maleficence	<ul style="list-style-type: none"> Analyze ethical dilemmas in healthcare practice involving breach in principle of beneficence and non-maleficence Explain what procedures adopted to maintain the principle of beneficence and non-maleficence in 	C3 C2	Short video demonstration on violation of Ethical principle of beneficence and non-maleficence from suit CBEC Video resources	<ul style="list-style-type: none"> Assignment based assessment involving real life case scenarios under aggregate Marks

	challenging situations <ul style="list-style-type: none"> Identify situations in which a doctor may have to take decisions in the best interests of the patient considering the principle of beneficence and non-maleficence 	C1	Students deliberations and reflections Reflective writing	(Internal Assessment) <ul style="list-style-type: none"> Assignment to be uploaded on LMS
Ethical dilemmas practice involving breach in principle of justice	<ul style="list-style-type: none"> Analyze ethical dilemmas in healthcare practice involving breach in principle of justice Explain what procedures adopted to maintain the principle of justice in challenging situations Identify situations in which a doctor may have to take decisions in the best interests of the patient considering the principle of justice 	C3 C2 C1	Short video demonstration on violation of Ethical principle of beneficence and non-maleficence from suit CBEC Video resources Students deliberations and reflections Reflective writing	<ul style="list-style-type: none"> Assignment based assessment involving real life case scenarios under aggregate Marks (Internal Assessment) <ul style="list-style-type: none"> Assignment to be uploaded on LMS

Family Medicine				
Theory				
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Approach to a patient with headache	<ul style="list-style-type: none"> Describe presenting complains of patients with Headache 	C3	LGIS-1	MCQs
	<ul style="list-style-type: none"> Discuss complications of Headache 			
	<ul style="list-style-type: none"> Describe initial treatment of patients with Headache 			
	<ul style="list-style-type: none"> Know when to refer patient to consultant/ Hospital 			

Early Clinical Exposure (ECE)		
Rotation to Department of Medicine		
Session	Learning Objectives	Teaching Strategy
I Cases of stroke	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none">• Observe and describe the different types of stroke, including ischemic and hemorrhagic strokes, and explain the pathophysiological changes that occur in the brain as a result of these conditions.• Discuss the major risk factors for stroke, such as hypertension, atrial fibrillation, and diabetes, and recognize the early clinical signs and symptoms using the FAST (Face drooping, Arm weakness, Speech difficulties, Time to call emergency services) mnemonic.• Describe the initial steps in the management of stroke, including the importance of rapid assessment and intervention, the role of imaging in diagnosis, and the basic treatment strategies for ischemic versus hemorrhagic stroke	<ul style="list-style-type: none">• Bedside Teaching• Duration 1 hour• Conducted by senior faculty member of unit
II Paraplegia	<ul style="list-style-type: none">• Outline the anatomical structures of the spinal cord and its functional relationship with the body, understanding how injuries or diseases affecting these areas can lead to paraplegia.• Discuss the various etiologies of paraplegia, including traumatic spinal cord injury, tumors, infectious diseases, and degenerative disorders, and explain the pathophysiological mechanisms that result in the loss of motor and sensory functions below the level of injury.• Describe the initial clinical assessment of a patient with suspected paraplegia, including the importance of a thorough neurological examination and the use of diagnostic imaging. They will also learn about the basic principles of acute management and the multidisciplinary approach needed for long-term rehabilitation.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hour• Conducted by senior faculty member of unit
III Vegetative state	<ul style="list-style-type: none">• Define a vegetative state and differentiate it from other conditions affecting consciousness, such as coma and minimally conscious states, based on clinical characteristics and brain activity.• Identify and explain the various causes that can lead to a vegetative state, including traumatic brain injury, severe brain hypoxia, and major neurological diseases, and discuss the underlying pathophysiological changes in the brain.• Describe assessment techniques used to determine the extent of brain function, the typical medical care provided, and the ethical challenges involved in decisions about long-term care, including discussions on quality of life and end-of-life decisions.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hrs• Conducted by senior faculty member of unit

Rotation to Department of Surgery/ Neurosurgery		
Session	Learning Objectives	Teaching Strategy
I Head injury	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> Classify head injuries into major categories such as concussions, contusions, skull fractures, and intracranial hematomas, and understand the mechanisms that typically cause these injuries. Recognize the immediate and delayed signs and symptoms of head injuries, including changes in consciousness, visible head trauma, cognitive impairments, and neurological deficits. Describe the basic pathophysiological changes that occur in the brain following different types of head injuries, such as the cascading effects of brain swelling, the impact of blood-brain barrier disruptions, and neuronal damage. Understand the initial steps in the assessment and management of a patient with a head injury, including maintaining airway, breathing, and circulation, the use of imaging modalities like CT scans to assess internal damage, and the criteria for when to escalate care to neurosurgical interventions. 	<ul style="list-style-type: none"> Bedside Teaching Duration 1 hour Conducted by senior faculty member of unit
II Nerve injuries	<ul style="list-style-type: none"> Describe the basic anatomy of peripheral nerves and be able to classify nerve injuries according to severity, using the Sunderland and Seddon classification systems, which categorize injuries based on the extent of damage to nerve fibers and surrounding structures. List the common causes of nerve injuries, including traumatic injuries (such as lacerations and avulsions), compression (from tumors or entrapment syndromes), and iatrogenic injuries (resulting from medical or surgical procedures). Understand how to recognize the clinical manifestations of nerve injuries, such as loss of sensation, motor function, or autonomic dysfunction in the affected area, and how these symptoms correlate with the specific nerve damaged. Discuss the initial steps in the management of nerve injuries, including the importance of a thorough neurological examination, the use of diagnostic tools like electromyography (EMG) and nerve conduction studies, and the principles guiding acute treatment and referral for possible surgical intervention. 	<ul style="list-style-type: none"> Bedside teaching Duration 1 hour Conducted by senior faculty member of unit
	<ul style="list-style-type: none"> Define coma as a deep state of unconsciousness and distinguish it from other states such as vegetative state, minimally conscious state, and brain death by understanding the clinical and neurological criteria for each. Explain the underlying pathophysiological mechanisms that can induce coma, including traumatic brain injuries, strokes, brain tumors, infections, and metabolic imbalances. They will also discuss the role of disruptions in the reticular activating system and cerebral cortex in the maintenance of consciousness. 	<ul style="list-style-type: none"> Bedside teaching Duration 1 hrs

	<ul style="list-style-type: none">• Use the Glasgow Coma Scale (GCS) to assess the level of consciousness in a patient, interpreting scores to gauge the severity of the coma and potential outcomes. They will also identify other important clinical signs such as pupillary responses and motor reflexes that help differentiate the cause of coma.• Understand the initial diagnostic steps required when assessing a comatose patient, including neuroimaging, blood tests, and possibly lumbar puncture. They will also discuss the basic management principles aimed at preserving life and brain functions.	<ul style="list-style-type: none">• Conducted by senior faculty member of unit
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Rotation to Department of Radiology		
Session	Learning Objectives	Teaching Strategy
<p>I</p> <p>CT scan</p> <p>Brain</p> <ul style="list-style-type: none">• Normal• Stroke• Hemorrhage• Infarction	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none">• Recognize the normal anatomical structures visible on a CT scan of the brain, including the cerebral hemispheres, cerebellum, brainstem, ventricles, and major sulci and gyri. They will also understand the typical appearances of these structures in different slices (axial, coronal, and sagittal).• Identify the CT findings associated with ischemic and hemorrhagic strokes, including areas of hypodensity in ischemic stroke and hyper density in hemorrhagic stroke. They will understand the importance of timing in the imaging of stroke for optimal diagnosis and management.• Describe the key differences in appearance between brain hemorrhages and infarctions on CT scans. They will be able to describe the characteristics of hemorrhages (e.g., acute intracerebral hemorrhage appearing as a hyperdense area) and infarctions (e.g., loss of cortical definition and the appearance of infarcted areas as hypodense).• Interpret CT images in the context of clinical symptoms to make preliminary diagnoses and understand potential management strategies. This objective aims to integrate their radiographic findings with clinical reasoning to enhance their diagnostic acumen.	<ul style="list-style-type: none">• Bedside Teaching• Duration 1 hour• Conducted by senior faculty member of unit
<p>II</p> <p>Hydrocephalus</p>	<ul style="list-style-type: none">• Define hydrocephalus as the abnormal accumulation of cerebrospinal fluid (CSF) within the ventricles of the brain.• Distinguish between the types of hydrocephalus, including communicating, non-communicating (obstructive), and ex-vacuo, and understand the mechanisms that lead to each type.• Identify the common causes of hydrocephalus, such as congenital malformations, infections, tumors, and traumatic injuries.• Discuss the pathophysiological changes that occur, focusing on the dynamics of CSF production, flow, and absorption.• Describe the clinical manifestations of hydrocephalus, which may vary by age and the rate of CSF accumulation.• Discuss the diagnostic tools used to identify hydrocephalus, primarily imaging techniques such as ultrasound in infants, CT scans, and MRIs.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hour• Conducted by senior faculty member of unit

	<ul style="list-style-type: none"> Describe the treatment options available, including surgical interventions like ventriculoperitoneal shunt placement and endoscopic third ventriculostomy. 	
<p>III</p> <p>Brain atrophy</p>	<ul style="list-style-type: none"> Define brain atrophy as the loss of neurons and the connections between them, resulting in decreased brain volume. They will differentiate between focal atrophy, which affects specific areas of the brain, and generalized atrophy, which involves a reduction in the size of multiple brain regions. Identify the various causes of brain atrophy, including neurodegenerative diseases (such as Alzheimer's disease and Parkinson's disease), traumatic brain injuries, stroke, and infectious diseases. Describe the signs and symptoms of brain atrophy, such as cognitive decline, memory impairment, changes in motor skills, and alterations in behavior or personality, depending on the areas of the brain that are affected. Discuss the role of imaging studies, such as MRI and CT scans, in diagnosing brain atrophy, and how these images can be used to assess the extent and pattern of atrophy. Discuss the management approaches aimed at slowing the progression of symptoms and improving quality of life, including pharmacological treatments and supportive therapies. 	<ul style="list-style-type: none"> Bedside teaching Duration 1 hrs Conducted by senior faculty member of unit
<p>IV</p> <p>Brain Edema</p>	<ul style="list-style-type: none"> Define brain edema Distinguish between the two main types of brain edema: cytotoxic edema, which involves fluid buildup within brain cells due to cellular injury, and vasogenic edema,. Identify various causes of brain edema, including traumatic brain injury, ischemic stroke, infections, tumors, and toxic exposures. Describe the clinical signs and symptoms of brain edema, which may include headache, nausea, vomiting, altered consciousness, and neurological deficits such as weakness or speech disturbances, depending on the severity and location of the edema. Understand the diagnostic techniques used to identify brain edema, primarily imaging studies like CT and MRI scans Discuss the management options available, including medical treatments to reduce swelling (such as corticosteroids and osmotic diuretics), surgical interventions to relieve pressure, and the importance of addressing the underlying cause of the edema. 	<ul style="list-style-type: none"> Bedside teaching Duration 1 hrs Conducted by senior faculty member of unit
	<ul style="list-style-type: none"> Classify the types of skull fractures (such as linear, depressed, diastatic, and basilar) and spine fractures (including compression, burst, flexion-distraction, and fracture-dislocation). Describe the Pathophysiology of Skull and Spine Fractures: Students will explore the pathophysiological implications of these fractures, including potential complications such as intracranial hemorrhage from skull fractures and spinal cord injury from spine fractures. They will examine how the location and severity of the fracture impact neurological outcomes. 	

V Skull/ spine Fractures	<ul style="list-style-type: none">• Identify the clinical manifestations associated with skull and spine fractures. For skull fractures, symptoms may include visible deformities, cerebrospinal fluid leakage from nose or ears, and neurological deficits. For spine fractures, symptoms can include pain, paralysis, loss of sensation, and autonomic dysregulation.• Understand the diagnostic procedures used to assess skull and spine fractures, primarily focusing on imaging techniques like X-rays, CT scans, and MRI.• Discuss initial management strategies, including stabilization, neurologic assessment, and when to refer for surgical intervention.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hrs• Conducted by senior faculty member of unit
VI MRI Brain/ Spine	<ul style="list-style-type: none">• Describe the fundamental principles of MRI technology, including how magnetic fields and radio waves are used to create detailed images of the brain and spinal structures.• Enlist the key indications for using MRI over other imaging modalities, such as its superior ability to differentiate between soft tissues and its usefulness in diagnosing conditions like tumors, inflammatory diseases, and vascular anomalies.• Recognize normal anatomical structures of the brain and spine on MRI scans.• Identify common pathological findings, such as signs of herniated discs, spinal stenosis, brain tumors, multiple sclerosis plaques, and evidence of acute or chronic stroke.• Develop skills in interpreting MRI features that are specific to neurological conditions,• Describe the safety considerations associated with MRI, including the importance of screening for contraindications like implanted metallic devices.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hrsConducted by senior faculty member of unit

List of CNS Module Spiral Courses Lectures					
Date/Day	Department	Time	Week	Topic Of Lectures	Teachers
02-08-2024 Friday	Quran Translation	10:00AM – 11:00 AM	1 st Week	Imaniyaat-5	Mufti Naeem Sherazi (Odd)
02-08-2024 Friday	Quran Translation	11:00AM – 12:00 PM	1 st Week	Imaniyaat-6	Mufti Naeem Sherazi (Even)
09-08-2024 Friday	Quran Translation	10:00AM – 11:00 AM	2 nd Week	Musawat	Mufti Naeem Sherazi (Even)
				Tehreek-e-Pakistan (1940-1947	Qari Aman Ullah (Odd)
09-08-2024 Friday	Quran Translation	11:00AM – 12:00 PM	2 nd Week	Tehreek-e-Pakistan (1940-1947	Qari Aman Ullah (Even)
				Musawat	Mufti Naem Sherazi (Odd)
16-08-2024 Friday	Pakstudies/Islammiyat	10:00AM – 11:00 AM	3 rd Week	Khwateen k hakook	Mufti Naem Sherazi (Odd)
				Qayam e Pakistan, ibtidaimushkilaat	Qari Aman Ullah (Even)
16-08-2024 Friday	Pakstudies/Islammiyat	11:00AM – 12:00 PM	3 rd Week	Qayam e Pakistan, ibtidaimushkilaat	Qari Aman Ullah (Even)
				Khwateen k hakook	Mufti Naem Sherazi (Odd)
26-08-2024 Monday	Family Medicine (LGIS)	11:20AM – 12:10 PM	5 th Week	Approach to a patient with neuronal disease	Dr. Sadia
27-08-2024 Tuesday	Behavioral Sciences (LGIS)	11:20AM – 12:10 PM	5 th Week	Memory & Emotions	Dr. M. Azeem Rao (Even)
					Dr. Zarnain Umar (Odd)
29-08-2024 Thursday	Behavioral Sciences (LGIS)	11:20AM – 12:10 PM	5 th Week	Metacognition	Dr. Zarnain Umar (Even)
					Dr. Ali Tasaddaq (Odd)
30-08-2024 Friday	Quran Translation IV	08:00AM – 09:00 AM	5 th Week	Momalat-I	Mufti Naeem Sherazi (Odd)
	Quran Translation V	09:00AM – 10:00 AM		Momalat-II	Mufti Naeem Sherazi (Even)

Block-III

Module No. 5 - Special Senses

Duration 5 Weeks



Special Senses Module Team

Module Name	:	Reproduction Module
Duration of module	:	04 Weeks
Coordinator	:	Dr. Rahat
Co-coordinator	:	Dr. Fareed Ullah
Reviewed by	:	Module Committee

Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Minahil Haq (Senior Demonstrator of Anatomy)
2.	Director DME	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Farzana Fatima
3.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf	3.	Co-coordinator	Dr. Sadia Baqir (Senior Demonstrator of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Romessa (Demonstrator of Biochemistry)
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5.	Co-coordinator	Dr. Fareed Ullah Khan (Senior Demonstrator of Physiology)
6.	Focal Person Anatomy Second Year MBBS	Dr. Maria Tasleem			
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.	DME Implementation Team	Prof. Dr. Ifra Saeed 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			
13.	Focal Person Quran Translation Lectures	Dr. Uzma Zafar			
14.	Focal Person Family Medicine	Dr. Sadia Khan			

Themes								
Block	Subjects	Embryology	Histology	Histology Practical SKL. Lab.	Gross Anatomy	CBL	SDL	
III	<ul style="list-style-type: none">Anatomy	<ul style="list-style-type: none">Development of EyeDevelopment of Pharyngeal archesDevelopment of Ear	<ul style="list-style-type: none">Histology of EyeHistology of Ear	<ul style="list-style-type: none">CorneaRetinaExternal and Internal ear	<ul style="list-style-type: none">Facial and superior aspect of cranium (Norma frontalis, Norma verticalis)External surface of cranial base (Norma basalis)Lateral and occipital aspect of cranium (Norma lateralis, occipitalis)MandibleTemporomandibular jointFaceScalpOrbit boundaries and Extraocular musclesVessels and nerves of orbitEyeballEyelid and lacrimal apparatusParotid and temporal regionInfratemporal fossaPterygopalatine fossaExternal and middle earInner earNose and paranasal sinuses	<ul style="list-style-type: none">Oculomotor nerve palsyExtra Dural hemorrhage	<ul style="list-style-type: none">Norma frontalis, verticalis and basalisLateralis and occipitalis, TMJ & MandibleOrbit boundariesExtraocular musclesVessels and Nerves of orbitTemporal and Infra temporal region, Pterygopalatine fossaExternal and middle ear	
	<ul style="list-style-type: none">Physiology	<ul style="list-style-type: none">Physiology of Ear & Eye						
	<ul style="list-style-type: none">Biochemistry	<ul style="list-style-type: none">Receptors, Second messengers, Neurotransmitters, Vitamin A role in vision						
	Spiral Courses							
	<ul style="list-style-type: none">The Holy Quran Translation	<ul style="list-style-type: none">						
	<ul style="list-style-type: none">Islamiyat	<ul style="list-style-type: none">Imaniat (Hadith)Zimidaari aur taluqaatUswa-e-hasna						
	<ul style="list-style-type: none">Pak Studies	<ul style="list-style-type: none">Pakistan ki jughraiyyai ahmiyat aur difai haisiyatPakistan k hamsaya mumalik se taluqaat						

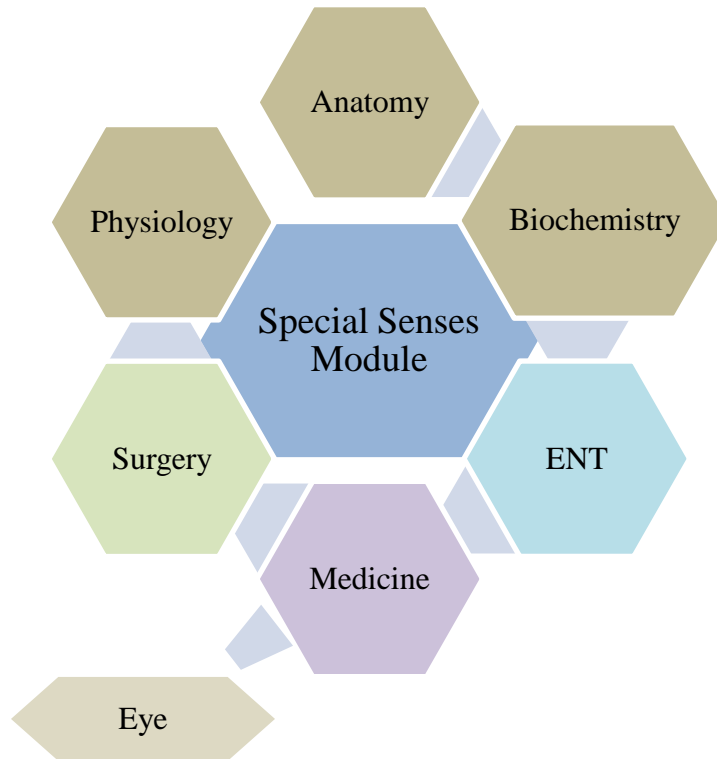
		<ul style="list-style-type: none">● Pakistan k qudrati wasail-maadniyaat
	<ul style="list-style-type: none">● Biomedical Ethics / Professionalism	<ul style="list-style-type: none">● Ethical dilemmas Involving breach in Justice
	<ul style="list-style-type: none">● Behavioral Sciences	<ul style="list-style-type: none">● Perception
	<ul style="list-style-type: none">● Radiology & Artificial Intelligence	<ul style="list-style-type: none">● General radiologic concepts
	<ul style="list-style-type: none">● Family Medicine	<ul style="list-style-type: none">● Approach to a patient with earache
	Vertical Integration	
	<ul style="list-style-type: none">● Surgery	<ul style="list-style-type: none">● Plastic surgery
	<ul style="list-style-type: none">● ENT	<ul style="list-style-type: none">● Nasal polyp & Sinusitis & Diseases of External Nose● Otitis Media Ear Discharge &Hearing Problems in Children● Facial fractures
	<ul style="list-style-type: none">● Medicine	<ul style="list-style-type: none">● Management Of Covid-19 Sense of Smell
	<ul style="list-style-type: none">● Eye	<ul style="list-style-type: none">● Refractive Errors Strabismus● Ocular trauma & Ocular Procedures● Conjunctivitis Chalazion● Cataract & Glaucoma & Anti glaucoma drugs
	Early Clinical Exposure (ECE)	
	<ul style="list-style-type: none">● Medicine	<ul style="list-style-type: none">● Hyperthyroidism● Hypothyroidism● Cushing Syndrome
	<ul style="list-style-type: none">● Surgery	<ul style="list-style-type: none">● Thyroid Nodule● Multi nodular Goiter● CA Thyroid● Graves Diseases
	<ul style="list-style-type: none">● Eye	<ul style="list-style-type: none">● Blindness● Visual field defect● Cataract
	<ul style="list-style-type: none">● Otolaryngology	<ul style="list-style-type: none">● Deafness● Hearing tests● Nasal Obstruction
Clinical Themes		
	<ul style="list-style-type: none">● Pathophysiology of Cataracts and Management Options● Glaucoma: Types, Mechanisms, and Treatment● Otitis Media and Externa: Causes and Management● Hearing Loss: Types and Clinical Evaluation	

	<ul style="list-style-type: none">● Pathophysiology of Rhinitis and Sinusitis● Diagnosis and Management of Nasopharyngeal Carcinoma● Vertigo: Peripheral vs. Central Causes● Retinal Detachment: Diagnosis and Surgical Management● Disorders of Taste and Smell: Causes and Clinical Features● Basics of Audiometry in Hearing Assessment
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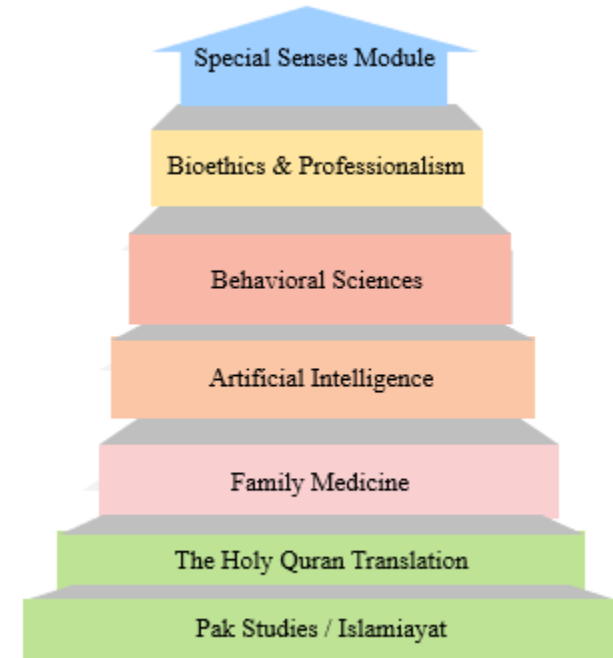
Implementation of Terms of Reference (TORS)

- 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
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Integration of Disciplines in Special Senses Module



Spiral / General Education Cluster Courses



Module No. 3 – Special Senses

Rationale: Visual system is a blessing, and no one can underestimate the importance of sight in one's life. It is a highly sensitive system. Unfortunately, it is among the neglected parts of health care and millions of people are getting blind either due to negligence or inappropriate treatment. Refractive errors, cataract, glaucoma and diabetic eye disease are among the ophthalmic diseases which can be easily treated, and morbidity prevented if diagnosed earlier. A young doctor must know how to screen out eye diseases and treat where possible. It is our responsibility to provide them with the required acumen.

Ear, Nose and Throat disorders are very common in the community and form a major portion of clinical practice of a general / family physician. Common ENT problems like pharyngitis, tonsillitis, Otitis media, rhinosinusitis, nasal allergy, deafness, vertigo and balance problems can be diagnosed and treated easily. The prevalence of cancer of the upper aerodigestive tract is very high in Pakistan. These patients must be diagnosed and treated at the early stages to reduce morbidity and mortality. Medical students must be made aware of the importance of proper management of ENT problems for the benefit of community and humanity.

Module Outcomes

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

Knowledge

- Integrate the basic knowledge and clinical problems.
- Take detailed history, examine the patients and make a provisional diagnosis with the plan of management.
- Timely refer the patient to an ophthalmologist or ENT specialist.
- Used technology based Medical Education including **Artificial Intelligence**
- Appreciate concept and importance of **Family Medicine, Biomedical Ethics, & Research.**

Skills

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

Attitude

- Demonstrate effective communication skill strategies while interacting with patients.
 - Demonstrate teamwork and positive interaction with colleagues.
 - Demonstrate self learning attitude and problem-solving skills.
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Syllabus of Special Senses (Module No. 5)

Anatomy				
Theory				
7Topics	At the end of lecture students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Development				
Development of Pharyngeal apparatus	<ul style="list-style-type: none"> Define the pharyngeal arch apparatus. Describe components of pharyngeal arches. Enlist derivatives of each of pharyngeal arch. Describe the development of pharyngeal grooves and pharyngeal membranes. Enlist the derivatives of pharyngeal pouches and clefts. Enlist common birth defects associated with pharyngeal apparatus. Explain the embryological basis of these defects. Understand the bio-physiological aspects of arches. Correlate with the clinical conditions. understand provision of curative and preventive health care measures. Practice principles of bioethics. Apply strategic use of AI in health care. Read relevant research article. 	C1 C2 C1 C2 C1 C1 C2 C2 C3 C3 C3 C3 C3	LGIS	MCQ SAQ VIVA OSPE
Development of face, nasal cavities	<ul style="list-style-type: none"> Describe the developmental stages of face. Discuss the role of neural crest cells in development of facial skeleton and pharyngeal arch derivatives. Describe the molecular regulation of facial development. Discuss the congenital anomalies of face. Describe the development of nasal cavities and paranasal sinuses. 	C2 C2 C2 C3 C2	LGIS	MCQ SAQ VIVA OSPE

	<ul style="list-style-type: none"> • Understand the bio-physiological aspects of face & nasal cavities • Correlate with the clinical conditions. • understand provision of curative and preventive health care measures. • Practice principles of bioethics. • Apply strategic use of AI in health care. • Read relevant research article. 	C3 C3 C3 C3 C3 C3		
Development of palate	<ul style="list-style-type: none"> • Discuss the development of primary and secondary palate. • Enlist the different varieties of cleft palate. • Discuss the etiology of cleft lip and cleft palate. • Describe embryological basis of craniofacial anomalies. • Understand the bio-physiological aspects of Palate. • Correlate with the clinical conditions. • understand provision of curative and preventive health care measures. • Practice principles of bioethics. • Apply strategic use of AI in health care. • Read relevant research article. 	C2 C1 C3 C3 C2 C3 C3 C3 C3 C3	LGIS	MCQ SAQ VIVA OSPE
Development of Eye I	<ul style="list-style-type: none"> • Describe the different embryological sources of development of eye. • Describe development of eye field on rostral neural tube. • Enlist derivatives of optic cup and development of retina. • Recall the differentiation of optic grooves and optic vesicle. • Discuss transformation of optic vesicles into optic cup. • Describe development of retina. 	C2 C2 C1 C2 C2	LGIS	MCQ SAQ VIVA OSPE

(Optic Cup & Retina)	<ul style="list-style-type: none"> • Correlate with the clinical conditions. • understand provision of curative and preventive health care measures. • Practice principles of bioethics. • Apply strategic use of AI in health care. • Read relevant research article. 	C2 C3 C3 C3 C3		
Development of Eye II (Congenital defects)	<ul style="list-style-type: none"> • Describe formation of optic stalk. • Explain induction of optic placodes and lens primordia. • Enumerate neural crest cell and mesenchymal derived eye structures. • Enlist the molecular regulation of eye development. • Discuss birth defects of the eye. • Correlate with the clinical conditions. • understand provision of curative and preventive health care measures. • Practice principles of bioethics. • Apply strategic use of AI in health care. • Read relevant research article. 	C2 C2 C1 C1 C2 C3 C3 C3 C3 C3	LGIS	MCQ SAQ VIVA OSPE

Development of Ear	<ul style="list-style-type: none"> • Explain the development of optic placodes, otic pit, otic vesicle and otic capsule. • Enlist derivatives of otic vesicle and otic capsule. • Describe development of middle ear cavity and Eustachian tube from tubotympanic recess. • Describe the development of auditory ossicles, tympanic membrane and mastoid antrum. • Discuss development of external acoustic meatus. • Enlist common congenital anomalies associated with ear development. • Describe the embryological basis of these anomalies • Correlate with the clinical conditions. • understand provision of curative and preventive health care measures. • Practice principles of bioethics. • Apply strategic use of AI in health care. • Read relevant research article. 	C2 C1 C2 C2 C2 C1 C2 C3 C3 C3 C3	LGIS	MCQ SAQ VIVA OSPE
Histology				
Histology of Ear	<ul style="list-style-type: none"> • Describe the structural differences between outer, middle and inner ear. • Discuss the functions of different parts of ear. • Distinguish the auditory part of inner ear from the vestibular system. • Discuss their roles in hearing & balance • Describe the function of sensory hair cells. • Describe the appearance and function of spiral ganglia. 	C2 C2 C2 C2 C2	LGIS	MCQ SAQ VIVA

	<ul style="list-style-type: none"> Understand the bio-physiological aspects of hearing Correlate with the clinical conditions. Understand provision of curative and preventive health care measures. Practice principles of bioethics. Apply strategic use of AI in health care. Read relevant research article. 	C2 C3 C3 C3 C3 C3		OSPE
Histology of Eye I (Fibrous & Vascular coat)	<ul style="list-style-type: none"> Discuss the histology of different coats of the eyeball. Describe histological sections of sclera & Cornea. Describe the histology of choroid, ciliary body and iris. Discuss histological sections of accessory structures of the eye. Discuss the histological details of lens chamber & Vitroeus body. Understand the bio-physiological aspects of vision Correlate with the clinical conditions like glaucoma, cataract. understand provision of curative and preventive health care measures. Practice principles of bioethics. Apply strategic use of AI in health care. Read relevant research article. 	C2 C2 C2 C2 C2 C2 C3 C3 C3	LGIS	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> Describe layers of retina Discuss retinal pigment epithelium 	C2 C2		

Histology of Eye II (Retina & Photoreceptors)	<ul style="list-style-type: none"> Discuss histology& functions of neuronal retina. 	C2	LGIS	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> Describe photoreceptors & rod cells. 	C2		
	<ul style="list-style-type: none"> Understand the bio-physiological aspects of Palate. 	C2		
	<ul style="list-style-type: none"> Correlate with the clinical conditions like retinal detachment 			
	<ul style="list-style-type: none"> understand provision of curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice principles of bioethics. 	C2		
	<ul style="list-style-type: none"> Apply strategic use of AI in health care. 			
	<ul style="list-style-type: none"> Read relevant research article. 	C3		
		C3		
		C3		

Topics	At the end of lecture students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Facial & Superior Aspect of Cranium (Norma Frontalis & Verticalis.)	<ul style="list-style-type: none"> Define boundaries of Norma frontalis and verticalis. 	C1	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> Enumerate their muscle attachment. 	C1		
	<ul style="list-style-type: none"> Describe and features of its structure 	C2		
	<ul style="list-style-type: none"> Correlate with the clinical conditions. 	C3		
	<ul style="list-style-type: none"> understand provision of curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice principles of bioethics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of AI in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research article 	C3		
External Surface of Cranial Base (Norma Basalis)	<ul style="list-style-type: none"> Describe bones forming the base of skull 	C2	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> Explain the details of anterior, middle and posterior part of base of skull 	C2		
	<ul style="list-style-type: none"> Identify different foramina and structures passing through them. 	C1		
	<ul style="list-style-type: none"> Explain the attachments and relations of base of skull. 	C2		
	<ul style="list-style-type: none"> Fracture of cranial base 	C2		
	<ul style="list-style-type: none"> Head injuries and intracranial hemorrhage 	C3		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> understand provision of curative and preventive health care measures. 	C3		

	<ul style="list-style-type: none"> Practice principles of bioethics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of AI in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research article 	C3		
Lateral & Occipital Aspect of Cranium (Norma Lateralis. & Occipitalis)	<ul style="list-style-type: none"> Enlist various bones in normal lateralis. Describe the cranial and facial subdivision. Define external acoustic meatus, 	C1	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> Discuss attachments of mastoid and styloid process. 	C2		
	<ul style="list-style-type: none"> Explain the boundaries of Norma occipitalis. 	C2		
	<ul style="list-style-type: none"> Identify different foramina and structures passing through them at the base. 	C1		
	<ul style="list-style-type: none"> Explain its attachments and relations. 	C2		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> understand provision of curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice principles of bioethics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of AI in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research article 	C3		
Mandible	<ul style="list-style-type: none"> Describe the anatomical features of mandible 	C2	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> Describe parts of mandible 	C2		
	<ul style="list-style-type: none"> Explain structural features of each part 	C2		
	<ul style="list-style-type: none"> Enlist attachments of each part 	C1		
	<ul style="list-style-type: none"> Describe blood and nerve supply of mandible. 	C2		
	<ul style="list-style-type: none"> Interpret applied anatomy of mandible. 	C3		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> understand provision of curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice principles of bioethics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of AI in health care 	C3		
Temporomandibular joint (TMJ)	<ul style="list-style-type: none"> Discuss the temporomandibular joint, its type, formation and neurovascular supply. 	C2	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> Describe the movement's axis and muscles involved. 	C2		
	<ul style="list-style-type: none"> Correlate clinically disorders of the temporo- mandibular joint. 	C3		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> understand provision of curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> Practice principles of bioethics 	C3		

	<ul style="list-style-type: none"> • Apply strategic use of AI in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research article 	C3		
Face	<ul style="list-style-type: none"> • Discuss limits of face. 	C2	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> • Tabulate the muscles of face. (Superficial and deep) origin, insertion, nerve supply and action. 	C2		
	<ul style="list-style-type: none"> • Discuss their role in facial expression. 	C2		
	<ul style="list-style-type: none"> • Describe facial nerve palsy upper and lower motor neuron. 	C3		
	<ul style="list-style-type: none"> • Discuss nerve supply of face. 	C1		
	<ul style="list-style-type: none"> • Discuss superficial and deep vasculature of face. 	C1		
	<ul style="list-style-type: none"> • Map the outline of facial artery and vein on simulated patient / model. 	P+A		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • understand provision of curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice principles of bioethics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of AI in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research article 	C3		
Scalp and temple	<ul style="list-style-type: none"> • Explain the extent of scalp 	C2	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> • Describe the Scalp layers, nerves & vessels 	C2		
	<ul style="list-style-type: none"> • Discuss the clinical correlates like scalp injuries and scalp wounds. 	C3		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • understand provision of curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice principles of bioethics 	C3		
	<ul style="list-style-type: none"> • Apply strategic use of AI in health care 	C3		
	<ul style="list-style-type: none"> • Read relevant research article 	C3		
Orbit	<ul style="list-style-type: none"> • Discuss its location, surfaces and borders 	C2	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> • Describe its muscular and ligamentous attachment. 	C2		
	<ul style="list-style-type: none"> • Describe eyeball movements in relation to recti and oblique muscles. 	C2		
	<ul style="list-style-type: none"> • Discuss role of levator palpebrae superioris 	C2		
	<ul style="list-style-type: none"> • Discuss clinical correlations of different coats of eyeball. 	C2		
	<ul style="list-style-type: none"> • Explain extent and subdivisions of pharynx 	C2		
	<ul style="list-style-type: none"> • Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> • understand provision of curative and preventive health care measures. 	C3		
	<ul style="list-style-type: none"> • Practice principles of bioethics 	C3		

	<ul style="list-style-type: none"> • Apply strategic use of AI in health care • Read relevant research article 	C3		
	<ul style="list-style-type: none"> • Describe anatomy of eyeball with suspensory apparatus. 	C2		
	<ul style="list-style-type: none"> • Discuss different coats of eyeball with their nerve and blood supply. • Discuss refractive media and compartments of eyeball. • Correlate with the clinical conditions • understand provision of curative and preventive health care measures. • Practice principles of bioethics • Apply strategic use of AI in health care • Read relevant research article 	C2 C2 C3 C3 C3 C3	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> • Discuss the different components of lacrimal apparatus • Describe the lacrimal gland and its neurovascular supply • Correlate with the clinical conditions • understand provision of curative and preventive health care measures. • Practice principles of bioethics • Apply strategic use of AI in health care • Read relevant research article 	C2 C2 C3 C3 C3 C3 C3	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> • Describe boundaries of parotid region. • Discuss surfaces, innervation and relations of parotid gland. • Understand the bio-physiological aspects of arches • Map the outline of parotid gland and duct on simulated patient / model. • Correlate with the clinical conditions • understand provision of curative and preventive health care measures. • Practice principles of bioethics • Apply strategic use of AI in health care • Read relevant research article 	C2 C2 C2 P+As C3 C3 C3 C3 C3	Skills Lab	MCQ SAQ VIVA OSPE
	<ul style="list-style-type: none"> • Discuss the boundaries and contents of temporal region. • Describe the temporalis muscle and its relations • Enumerate the boundaries and contents of infratemporal region. • Discuss muscles of mastication • Correlate with the clinical conditions • understand provision of curative and preventive health care measures. • Practice principles of bioethics • Apply strategic use of AI in health care • Read relevant research article 	C2 C2 C1 C2 C3 C3 C3 C3 C3	Skills Lab	MCQ SAQ VIVA OSPE

Pterygopalatine Fossa	• Discuss the boundaries and contents of pterygopalatine fossa.	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Discuss the communications of pterygopalatine fossa.	C2		
	• Understand the bio-physiological aspects of arches	C2		
	• Correlate with the clinical conditions	C3		
	• understand 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		
External & Medial Ear	• Describe parts of the ear.	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Discuss walls and contents of external and middle ear,	C2		
	• Discuss their blood and nerve supply.	C2		
	• Explain pharyngeal tube, mastoid antrum and air cells.	C2		
	• Relation of chorda tympani and facial nerve.	C1		
	• Discuss Mastoiditis and tubal blockage	C3		
	• Correlate with the clinical conditions	C3		
	• understand 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		
Inner Ear	• Discuss membranous and bony labyrinth.	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Describe internal acoustic meatus.	C2		
	• Explain the course of 7th and 8th cranial nerve in detail.	C2		
	• Correlate with the clinical conditions	C3		
	• understand 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		
Nose & Paranasal Sinuses	• Discuss anatomy and location of paranasal air sinuses separately.	C2	Skills Lab	MCQ SAQ VIVA
	• Define & list names of paranasal sinuses	C1		
	• Describe their blood and nerve supply	C2		
	• Describe functions of paranasal sinuses.	C2		
	• Discuss drainage of paranasal sinuses.	C2		
	• Identify various sinuses in radiographs	C1		
	• Describe anatomy of external nose and features of nasal septum, side and anatomical position.	C2		

	<ul style="list-style-type: none"> Describe details of olfactory receptors and formation of olfactory nerve. 	C2		OSPE
	<ul style="list-style-type: none"> Discuss blood and nerve supply of external nose and nasal septum. 	C2		
	<ul style="list-style-type: none"> Explain functions of nose. 	C2		
	<ul style="list-style-type: none"> Discuss in detail clinical correlates of external nose and nasal septum. Lateral nasal wall and their importance. 	C2		
	<ul style="list-style-type: none"> Discuss on clinical importance of nasal cavity. 	C3		
	<ul style="list-style-type: none"> Correlate with the clinical conditions 	C3		
	<ul style="list-style-type: none"> understand provision of curative and preventive health care measures 	C3		
	<ul style="list-style-type: none"> Practice principles of bioethics 	C3		
	<ul style="list-style-type: none"> Apply strategic use of AI in health care 	C3		
	<ul style="list-style-type: none"> Read relevant research article 	C3		
Cross Sectional Anatomy	Identify the structures at <ul style="list-style-type: none"> Sagittal section of head Level passing through the vestibule of the nose, the inferior nasal the temporomandibular joint , the pons and the occipital lobe of the cerebrum. 	C3		

Topics	Learning objectives	Learning Resources	
Norma Frontalis and Verticalis.	<ul style="list-style-type: none"> Define boundaries of Norma frontalis and verticalis. 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 823-8291). 	
	<ul style="list-style-type: none"> Enumerate their muscle attachment. 		
	<ul style="list-style-type: none"> Describe and features of its structure 	<ul style="list-style-type: none"> https://youtu.be/rr3-V7Qhf8E 	
	<ul style="list-style-type: none"> Read relevant research article 	<ul style="list-style-type: none"> https://youtu.be/35Y71cRBqs8 	
External Surface of Cranial Base Norma Basalis.	<ul style="list-style-type: none"> Describe bones forming the base of skull 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, P829-836). 	
	<ul style="list-style-type: none"> Explain the details of anterior, middle and posterior part of base of skull 		
	<ul style="list-style-type: none"> Identify different foramina and structures passing through them. 	<ul style="list-style-type: none"> https://youtu.be/6ZjJPLOJ0N8 	
	<ul style="list-style-type: none"> Explain the attachments and relations of base of skull. 	<ul style="list-style-type: none"> https://youtu.be/75lLaDFJTP4 	
	<ul style="list-style-type: none"> Fracture of cranial base 	<ul style="list-style-type: none"> https://youtu.be/fteIKT_wQDE 	
	<ul style="list-style-type: none"> Head injuries and intracranial hemorrhage 		
	<ul style="list-style-type: none"> Read relevant research article 		
Lateral & Occipital Aspect of Cranium Norma Lateralis. Norma Occipitalis	<ul style="list-style-type: none"> Enlist various bones in normal lateralis. Describe the cranial and facial subdivision. 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 827-829). 	
	<ul style="list-style-type: none"> Define external acoustic meatus, 		
	<ul style="list-style-type: none"> Discuss attachments of mastoid and styloid process. 	<ul style="list-style-type: none"> https://youtu.be/tpkzPMXzwiM 	
	<ul style="list-style-type: none"> Explain the boundaries of Norma occipitalis. 	<ul style="list-style-type: none"> https://youtu.be/9Msvtw5CjFY 	
	<ul style="list-style-type: none"> Identify different foramina and structures passing through them at the base. 		

	<ul style="list-style-type: none"> Explain its attachments and relations. 		
	<ul style="list-style-type: none"> Read relevant research article 		
Mandible	<ul style="list-style-type: none"> Define location of mandible 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Pae 827). 	
	<ul style="list-style-type: none"> Describe parts of mandible 		
	<ul style="list-style-type: none"> Explain structural features of each part 	<ul style="list-style-type: none"> https://youtu.be/_IHosB-c_fQ 	
	<ul style="list-style-type: none"> Enlist attachments of each part 	<ul style="list-style-type: none"> https://youtu.be/Qc0ysecwMJg4 	
	<ul style="list-style-type: none"> Describe blood and nerve supply of mandible. 		
	<ul style="list-style-type: none"> Interpret applied anatomy of mandible. 		
	<ul style="list-style-type: none"> Read relevant research article 		
Temporomandibular joint	<ul style="list-style-type: none"> Discuss the temporomandibular joint, its type, formation, and neurovascular supply 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 916-920). 	
	<ul style="list-style-type: none"> Describe the movement's axis and muscles involved. 	<ul style="list-style-type: none"> https://youtu.be/6tJsi5oghNY 	
	<ul style="list-style-type: none"> Correlate clinically disorders of the temporo- mandibular joint. 	<ul style="list-style-type: none"> https://youtu.be/0BKU04QLzV0 	
	<ul style="list-style-type: none"> Read relevant research article 		
Orbit	<ul style="list-style-type: none"> Discuss its location, surfaces and borders 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 889-906). 	
	<ul style="list-style-type: none"> Describe its muscular and ligamentous attachment. 		
	<ul style="list-style-type: none"> Describe eyeball movements in relation to recti and oblique muscles. 	<ul style="list-style-type: none"> https://youtu.be/HKEA4p5k66U 	
	<ul style="list-style-type: none"> Discuss role of levator palpebrae superioris 	<ul style="list-style-type: none"> https://youtu.be/Oz4kGGiJNrA 	
	<ul style="list-style-type: none"> Discuss extraocular muscles of orbit. 		
	<ul style="list-style-type: none"> Supporting apparatus of eyeball. 		
	<ul style="list-style-type: none"> Nerves of eye ball 		
	<ul style="list-style-type: none"> Vasculature of orbit 		
Temporal Region	<ul style="list-style-type: none"> Read relevant research article 		
	<ul style="list-style-type: none"> Describe boundaries of parotid region. 	<ul style="list-style-type: none"> Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 914-916). 	
	<ul style="list-style-type: none"> Discuss surfaces, innervation and relations of parotid gland. 		
	<ul style="list-style-type: none"> Understand the bio-physiological aspects of arches 	<ul style="list-style-type: none"> https://youtu.be/HB6bN-rs2NU 	
	<ul style="list-style-type: none"> Read relevant research article 	<ul style="list-style-type: none"> https://youtu.be/zo7DDK-h1Mg 	

Infra temporal Fossa	<ul style="list-style-type: none"> • Discuss the boundaries and contents of temporal region. 	<ul style="list-style-type: none"> • Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 916-926). 	
	<ul style="list-style-type: none"> • Describe the temporalis muscle and its relations 		
	<ul style="list-style-type: none"> • Enumerate the boundaries and contents of infratemporal region. 	<ul style="list-style-type: none"> • https://youtu.be/z2GlluoOtMY 	
	<ul style="list-style-type: none"> • Discuss muscles of mastication 	<ul style="list-style-type: none"> • https://youtu.be/ixCCX46XWHA 	
	<ul style="list-style-type: none"> • Read relevant research article 		
Pterygopalatine Fossa	<ul style="list-style-type: none"> • Discuss the boundaries and contents of pterygopalatine fossa. 	<ul style="list-style-type: none"> • Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 951-954) 	
	<ul style="list-style-type: none"> • Discuss the communications of pterygopalatine fossa. 	<ul style="list-style-type: none"> • https://youtu.be/9taW-Th3ycc 	
	<ul style="list-style-type: none"> • Understand the bio-physiological aspects of arches 	<ul style="list-style-type: none"> • https://youtu.be/o_JbDynMZjo 	
	<ul style="list-style-type: none"> • Read relevant research article 		
External & Middle Ear	<ul style="list-style-type: none"> • Describe parts of the ear. 	<ul style="list-style-type: none"> • Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 966-973). 	
	<ul style="list-style-type: none"> • Discuss walls and contents of external and middle ear , 		
	<ul style="list-style-type: none"> • Discuss their blood and nerve supply. 	<ul style="list-style-type: none"> • https://youtu.be/VRLm7cpmZSk 	
	<ul style="list-style-type: none"> • Explain pharyngo tympanic tube, mastoid antrum and air cells. 	<ul style="list-style-type: none"> • https://youtu.be/unDpXRE_PPA 	
	<ul style="list-style-type: none"> • Relation of chorda tympani and facial nerve. 		
	<ul style="list-style-type: none"> • Discuss Mastoiditis and tubal blockage 		
	<ul style="list-style-type: none"> • Read relevant research article 		

Practicals				
Topics	At the End of Demonstration Student Should Be Able To	Learning Domains	Teaching Strategy	Assessment Tools
Cornea	<ul style="list-style-type: none">Identify the histological slide cornea.Illustrate the microscopic picture of Cornea.Enlist two points of identification of eachRead a relevant research article	P C2 C1 C3	Skill Lab	OSPE
Retina	<ul style="list-style-type: none">Identify the histological slide of retina.Illustrate the microscopic picture of retinaEnlist two points of identificationRead a relevant research article	P C2 C1 C3	Skill Lab	OSPE
Ear	<ul style="list-style-type: none">Identify the histological slide of earIllustrate the microscopic picture of earEnlist two points of identification of eachRead a relevant research article	P C2 C1 C3	Skill Lab	OSPE

Physiology						
Theory						
Topics	Learning Objectives	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
Introduction to Physiology of Eye & Optics of vision. General Principles of optics, Physiological basis for errors of refraction	<ol style="list-style-type: none"> 1. Explain the basic physiology of eye and its refractive surfaces 2. Discuss the physical principles of optics 3. Describe the mechanism of accommodation and its control 4. Describe the errors of refraction (Myopia, hyperopia, astigmatism and their correction by using different lens systems) 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 177,185) • Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 85 • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10,Page 374-378) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition,Vision(Chapter 64,Page 1086) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 50, Page 627-635) 	<ul style="list-style-type: none"> • https://www.britanica.com/science/human-eye • https://youtu.be/laEFdlxW0rA 	<ol style="list-style-type: none"> 1.C2 2. C2 3. C2 4.C2 	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Introduction to Physiology of external ear, Middle ear	<ol style="list-style-type: none"> 1.Describe physiology of external ear 2.Describe physiology of middle ear 3. Explain structure of middle ear 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 02, (Chapter 10, Page 199) • Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 92 • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10,Page 	<ul style="list-style-type: none"> • https://youtu.be/VRLm7cpmZSk • https://www.sciencedirect.com/science/article/pii/S0378595522002192 	<ol style="list-style-type: none"> 1. C2 2. C2 3. C2 	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment)

		364-371) <ul style="list-style-type: none"> Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 53, Page 663) 				OSPE
Fluid system of the eye Intraocular pressure, Function of the Structural Elements of the Retina	1.Describe the formation and circulation of aqueous humor 2.Explain the mechanism of regulation of intraocular pressure 3.Define glaucoma and its treatment	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 178) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition,Vision(Chapter 64,Page 1094) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 50, Page 635) (Chapter 51,Page 639) 	<ul style="list-style-type: none"> https://youtu.be/CkLlIOSh8o4 https://youtu.be/7CFY4gxLnMY https://my.clevelandclinic.org/health/body/24611-aqueous-humor-vitreous-humor 	1. C2 2. C2 3. C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Functions of Inner ear, Physiology of Hearing	1. Describe the physiology of hearing and function of tympanic membrane and ossicular system. 2. Define impendence matching and attenuation reflex 3. Explain the conduction of sound waves in the cochlea	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 10, Page 200,204) Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 93 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Sensory Physiology (Chapter 10,Page 371-374) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 53, Page 664,669) 	1. https://youtu.be/Ie2j7GpC4JU 2. https://youtu.be/qgdqp-oPb1Q 3. https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=90&ContentID=P02025	1. C2 2. C1 3. C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Photochemistry of vision	1. Describe the physiology of retinal layers 2. Explain photochemistry of vision (rhodopsin - retinal)	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 182) 	1. https://www.brainkart.com/article/Photochemistry-of-Eye-	1. C2 2. C2 3. C2	LGIS	MCQ

&Physiological basis for photo transduction	<ol style="list-style-type: none"> Describe the mechanism of activation of Rods Explain the photochemistry of color vision 	<ul style="list-style-type: none"> Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 87 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Sensory Physiology (Chapter 10,Page 379-387) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 51, Page 641) 	<ol style="list-style-type: none"> Vision 19676/ https://youtu.be/k9lrM5iPNuY 	4. C2		SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Hearing abnormalities, Tuning fork tests and audiometry	<ol style="list-style-type: none"> Explain the auditory nervous pathway and abnormalities associated with it. Describe the function of cerebral cortex in hearing. 	<ul style="list-style-type: none"> Physiological Basis of Medical Practice by Best & Taylor's.13th Edition(Chapter 62,Page 1067) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 53, Page 672) 	<ol style="list-style-type: none"> https://youtu.be/FgF91K7dU8Y https://youtu.be/acYMy9b0F2A https://www.uptodate.com/contents/image?imageKey=PC%2F58032&topicKey=PC%2F15359&source=see_link 	<ol style="list-style-type: none"> C2 C2 	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Light & dark adaptation, Color vision, Neural functions of the retina, Central neurophysiology of vision, Neural pathways for analysis of visual information	<ol style="list-style-type: none"> Explain the neural circuitry of the Retina Describe the physiology of visual pathway Name the optic lesion associated with visual pathway 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 189,193) Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 90 Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 51, Page 644)(Chapter 52,Page 653-657) 	<ol style="list-style-type: none"> https://youtu.be/wiYmTAuVimg https://youtu.be/cG5ZuK0_qtc https://teachmeanatomy.info/head/cranial-nerves/optic-cnii/ 	<ol style="list-style-type: none"> C2 C2 C1 	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Vestibular system	<ol style="list-style-type: none"> Describe the function of the organ of corti Explain vestibular system 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology. 25TH Edition. Section 02, Vision (Chapter 10, Page 209) Physiology by Linda S. Costanzo 6th Edition, Neurophysiology chapter 3, page 95 Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition, (Chapter 63, Page 1072) 	<ol style="list-style-type: none"> https://www.physio-pedia.com/Vestibular_System https://youtu.be/ryGMI3SpxCE https://youtu.be/mcp7qLh8_5c 	<ol style="list-style-type: none"> C2 C2 	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Lesions of visual pathway and its effects on field of vision, Movements of eye ball along with neural control	<ol style="list-style-type: none"> Explain the muscular control of eye movement Describe the fixation movements of eye Define accommodation reflex and pupillary light reflex Name the optic lesion associated with visual pathway 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology. 25TH Edition. Section 02, Vision (Chapter 09, Page 190) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10, Page 374-378) Textbook of Medical Physiology by Guyton & Hall. 14th Edition.. Section 10. (Chapter 52, Page 657) 	<ol style="list-style-type: none"> https://youtu.be/evLyI35m8xU https://teachmeanatomy.info/head/organs/eye/extraocular-muscles/ 	<ol style="list-style-type: none"> C2 C2 C2 C2 	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Sense of Taste and pathophysiology	<ul style="list-style-type: none"> List the primary sensation of taste Explain the mechanism of taste perception and its transmission into central nervous system 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology. 25TH Edition. Section 02, Vision (Chapter 11, Page 221) Physiology by Linda S. Costanzo 6th Edition, Neurophysiology chapter 3, page 100 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10, Page 361) Textbook of Medical Physiology by Guyton & Hall. 14th Edition.. Section 10. (Chapter 54, Page 675-679) 	<ol style="list-style-type: none"> https://youtu.be/K9JSBzEEA0o https://youtu.be/mFm3yA1nslE https://www.sciencedirect.com/topics/nursing-and-health-professions/taste 	<ol style="list-style-type: none"> C1 C2 	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Physiology of accommodation and clinical abnormalities	<ol style="list-style-type: none"> Define accommodation reflex and pupillary light reflex Explain Clinical abnormalities associated with accommodation 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 188) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 52, Page 660) 	<ol style="list-style-type: none"> https://youtu.be/xj0blrAx3_s https://teachmephysiology.com/nervous-system/ocular-physiology/ocular-accommodation/ 	<ol style="list-style-type: none"> C1 C2 	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Sense of Smell and pathophysiology	<ol style="list-style-type: none"> List the primary sensation of smell Describe the stimulation of olfactory cells and its transmission into central nervous system 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 11, Page 217) Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 98 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Sensory Physiology (Chapter 10,Page 358) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 54, Page 679) 	<ol style="list-style-type: none"> https://www.alimentarium.org/en/factsheet/senses-smell https://youtu.be/mFm3yA1nsIE 	<ol style="list-style-type: none"> C1 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
Physiology of Vision	<ol style="list-style-type: none"> Explain the basic physiology of eye and its refractive surfaces Discuss the physical principles of optics Describe the mechanism of accommodation and its control 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 177,185) Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 85 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10,Page 374-378) 	<ol style="list-style-type: none"> https://www.britannica.com/science/human-eye https://youtu.be/laEFdlxW0rA 	<ol style="list-style-type: none"> C2 C2 C2 C2 	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment,

	4. Describe the errors of refraction (Myopia, hyperopia, astigmatism and their correction by using different lens systems	<ul style="list-style-type: none"> Physiological Basis of Medical Practice by Best & Taylor's.13th Edition,Vision(Chapter 64,Page 1086) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 50, Page 627-635) 				MST based Assessment) OSPE
Physiology of Hearing	1. Describe the physiology of hearing and function of tympanic membrane and ossicular system. 2. Define impedance matching and attenuation reflex 3. Explain the conduction of sound waves in the cochlea	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 10, Page 200,204) Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 93 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Sensory Physiology (Chapter 10,Page 371-374) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 53, Page 664,669) 	1. https://youtu.be/Ie2j7GpC4JU 2. https://youtu.be/qgdqp-oPb1Q 3. https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=90&ContentID=P02025	1. C2 2. C1 3. C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Sense of Taste and Smell	1. List the primary sensation of taste 2. Explain the mechanism of taste perception and its transmission into central nervous system 3. List the primary sensation of smell 4. Describe the stimulation of olfactory cells and its transmission into central nervous system	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 11, Page 221) (Chapter 11, Page 217) Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 100 , chapter 3, page 98 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Sensory Physiology (Chapter 10,Page 361) (Chapter 10,Page 358) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 54, Page 675-679) . (Chapter 54, Page 679) 	1. https://youtu.be/K9JSBzEEA0o 2. https://youtu.be/mFm3yA1nsIE 3. https://www.sciencedirect.com/topics/nursing-and-health-professions/taste 4. https://www.alimentarium.org/en/fact-sheet/senses-smell 5. https://youtu.be/mFm3yA1nsIE	1.C1 2.C2 3.C1 4.C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Topics Of SDL	Learning Objective	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
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ON CAMPUS Introduction to Physiology of external ear, Middle ear	1. Describe physiology of external ear 2. Describe physiology of middle ear 3. Explain structure of middle ear	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology. 25TH Edition. Section 02, (Chapter 10, Page 199) Physiology by Linda S. Costanzo 6th Edition, Neurophysiology chapter 3, page 92 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10, Page 364-371) ❖ Textbook of Medical Physiology by Guyton & Hall. 14th Edition.. Section 10. (Chapter 53, Page 663) 	1. https://youtu.be/VRLm7cpmZSk 2. https://www.sciencedirect.com/science/article/pii/S0378595522002192	1. C2 2. C2 3. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE SDL Evaluation
Functions of Inner ear, Physiology of Hearing	1. Describe the physiology of hearing and function of tympanic membrane and ossicular system. 2. Define impedance matching and attenuation reflex 3. Explain the conduction of sound waves in the cochlea	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology. 25TH Edition. Section 02, Vision (Chapter 10, Page 200, 204) Physiology by Linda S. Costanzo 6th Edition, Neurophysiology chapter 3, page 93 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10, Page 371-374) Textbook of Medical Physiology by Guyton & Hall. 14th Edition.. Section 10. (Chapter 53, Page 664, 669) 	1. https://youtu.be/Ie2j7GpC4JU 2. https://youtu.be/qgdqp-oPb1Q 3. https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=90&ContentID=P02025	1. C2 2. C1 3. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE SDL Evaluation
Hearing abnormalities, Tuning fork tests and audiometry	1. Explain the auditory nervous pathway and abnormalities associated with it. 2. Describe the function of cerebral cortex in hearing.	<ul style="list-style-type: none"> Physiological Basis of Medical Practice by Best & Taylor's. 13th Edition (Chapter 62, Page 1067) Textbook of Medical Physiology by Guyton & Hall. 14th Edition.. Section 10. (Chapter 53, Page 672) 	1. https://youtu.be/FgF91K7dU8Y 2. https://youtu.be/acYMy9b0F2A 3. https://www.upToDate.com/contents/image?imageKey=PC%2F58032&topic	1. C2 2. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE SDL Evaluation

			Key=PC%2F15359&source=se e_link			
OFF CAMPUS Introduction to Physiology of Eye & Optics of vision. General Principles of optics, Physiological basis for errors of refraction	<ol style="list-style-type: none"> 1. Explain the basic physiology of eye and its refractive surfaces 2. Discuss the physical principles of optics 3. Describe the mechanism of accommodation and its control 4. Describe the errors of refraction (Myopia, hyperopia, astigmatism and their correction by using different lens systems) 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 177,185) • Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 85 • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10,Page 374-378) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition,Vision(Chapter 64,Page 1086) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 50, Page 627-635) 	<ul style="list-style-type: none"> • https://www.britannica.com/science/human-eye • https://youtu.be/lafEdlxW0rA 	<ol style="list-style-type: none"> 1.C2 2. C2 3. C2 4.C2 	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Fluid system of the eye Intraocular pressure, Function of the Structural Elements of the Retina	<ol style="list-style-type: none"> 1.Describe the formation and circulation of aqueous humor 2.Explain the mechanism of regulation of intraocular pressure 3.Define glaucoma and its treatment 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 178) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition,Vision(Chapter 64,Page 1094) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 50, Page 635) (Chapter 51,Page 639) 	<ul style="list-style-type: none"> • https://youtu.be/CKtLIOSh8o4 • https://youtu.be/7CFY4gxLnMY • https://my.clevelandclinic.org/health/body/24611-aqueous-humor-vitreous-humor 	<ol style="list-style-type: none"> 1. C2 2. C2 3. C1 	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Photochemistry of vision	<ol style="list-style-type: none"> 1. Describe the physiology of retinal layers 2. Explain photochemistry of vision (rhodopsin - retinal) 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 182) 	<ol style="list-style-type: none"> 3. https://www.britannica.com/article/Photochemistry-of-Eye-Vision_19676/ 	<ol style="list-style-type: none"> 1. C2 2. C2 3. C2 4. C2 	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based

&Physiological basis for photo transduction	3. Describe the mechanism of activation of Rods 4. Explain the photochemistry of color vision	<ul style="list-style-type: none"> Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 87 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Sensory Physiology (Chapter 10,Page 379-387) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 10. (Chapter 51, Page 641) 	https://youtu.be/k9lrM5iPNuY			Assessment, MST based Assessment) OSPE SDL Evaluation
Vestibular system	1. Describe the function of the organ of corti 2. Explain vestibular system	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 10, Page 209) Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 95 Physiological Basis of Medical Practice by Best & Taylor's.13 th Edition,(Chapter 63,Page 1072)	4. https://www.physio-pedia.com/Vestibular_System 5. https://youtu.be/ryGMI3SpxCE https://youtu.be/mcp7qLh8_5c	1. C2 2. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE SDL Evaluation
Sense of Taste and pathophysiology	1. List the primary sensation of taste 2. Explain the mechanism of taste perception and its transmission into central nervous system	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 11, Page 221) Physiology by Linda S. Costanzo 6th Edition,Neurophysiology chapter 3, page 100 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Sensory Physiology (Chapter 10,Page 361) Textbook of Medical Physiology by Guyton & Hall.14 th Edition..Section 10. (Chapter 54, Page 675-679)	3. https://youtu.be/K9JSBzEEA0o 4. https://youtu.be/mFm3yA1nslE 5. https://www.sciencedirect.com/topics/nursing-and-health-professions/taste	1.C1 2. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE SDL Evaluation
	1. List the primary sensation of smell	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 11, Page 217) 	6. https://www.alimentarium.org/en/fact-	1.C1 2.C2		MCQ SEQ VIVA VOCE

Sense of Smell and pathophysiology	2. Describe the stimulation of olfactory cells and its transmission into central nervous system	<ul style="list-style-type: none"> Physiology by Linda S. Costanzo 6th Edition, Neurophysiology chapter 3, page 98 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Sensory Physiology (Chapter 10, Page 358) Textbook of Medical Physiology by Guyton & Hall. 14 th Edition.. Section 10. (Chapter 54, Page 679)	7. sheet/senses-smell https://youtu.be/mFm3yA1nslE		SDL	MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
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Practicals					
Topic	Learning Objectives	Reference	Learning Domains	Learning Strategy	Assessment Tools
Estimation of Visual Acuity	<ul style="list-style-type: none"> Apparatus identification Principle Procedure Precautions Recall normal value of visual acuity Use of Snellen's chart & jaeger's chart Recall the different Errors of refraction 	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	P C1 P C1 C1 P C1	Practicals/skill lab	Viva Voce Ospe Video Assisted Assessment
Examination of 8 th Cranial Nerve (vestibular function)	<ul style="list-style-type: none"> Apparatus identification Principle Procedure Precautions Use various hearing tests & interpretation of their results Recall deafness, its types & causes 	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	P C1 P C1 C1 C1	Practicals/skill lab	Viva Voce Ospe Video Assisted Assessment

Performance of Hearing Test (cochlear function)	<ul style="list-style-type: none">• Apparatus identification• Principle• Procedure• Precautions• Use various hearing tests & interpretation of their results• Recall deafness, its types & causes	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	P C1 P C1 C1 C1	Practicals/skill lab	Viva Voce Ospe Video Assisted Assessment
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Biochemistry				
Theory				
Topic	Learning Objectives At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Receptors and their classification	Define receptors.	C1	LGIS	MCQs, SAQs& Viva
	Classify Receptors	C2		
Signal transduction G proteins	Explain the structure and function of G proteins	C2	LGIS	MCQs, SAQs & Viva
Signal transduction Second messenger system	Describe different types of second messengers	C2	LGIS	MCQs, SAQs & Viva
Neurotransmitters	Explain synthesis & functions of neurotransmitters.	C2	LGIS	MCQs, SAQs & Viva
	Discuss related clinical disorders	C3		
Role of vitamin A in vision	Explain the role of vitamin A in vision.	C2	LGIS	MCQs, SAQs & Viva
	Discuss related clinical abnormalities	C3		

Topic	Learning Objectives At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Receptors & G proteins	Explain different types of receptors and G proteins	C2	SGD	MCQs, SAQs& Viva
Neurotransmitters	Discuss synthesis, functions & clinical significance of neurotransmitters	C2	SGD	MCQs, SAQs & Viva

Topics Of SDL	Learning Objectives	Learning resources
Neurotransmitter	<ul style="list-style-type: none"> Explain synthesis & functions of neurotransmitters Discuss related clinical disorders 	<ul style="list-style-type: none"> Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 13, 21 page 166 & 317 - 319) Use digital library <ul style="list-style-type: none"> https://www.khanacademy.org/science/biology/human-biology/neuron-nervous-system/a/neurotransmitters-their-receptors https://youtu.be/LOHKVp8hn7o https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=neurotransmitters&oq=Neurotransmitter#:~:text=Axelrod%2CA0%2D%20Scientific%20American%2C%201974%20%2D%20JSTOR
Receptors	<ul style="list-style-type: none"> Define receptors Classify Receptors 	<ul style="list-style-type: none"> Text book of Biochemistry Lehninger 8th edition (Chapter 12, page 439- 440) Use digital library <ul style="list-style-type: none"> https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4817805/ https://www.sinobiological.com/research/receptors/what-are-receptors#:~:text=Receptors%20are%20proteins%2C%20usually%20cell,cells%2C%20monocytes%20and%20stem%20cells. https://youtu.be/vjFes5I07c0
G - Proteins	<ul style="list-style-type: none"> Explain the structure and function of G proteins 	<ul style="list-style-type: none"> Harper's Illustrated Biochemistry 32th edition (Chapter 42, page 503 – 505) Use digital library

		<ul style="list-style-type: none"> • https://youtu.be/GHwMJnxaiys • https://www.britannica.com/science/G-protein-coupled-receptor • https://www.nature.com/scitable/topicpage/gpcr-14047471/
Role of Vitamin A in Vision	<ul style="list-style-type: none"> • Explain the role of vitamin A in vision • Discuss related clinical abnormalities 	<ul style="list-style-type: none"> • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 28, page 433-434) • Use digital library <ul style="list-style-type: none"> • https://www.bing.com/search?pglt=41&q=role+of+vitamin+a+in+vision&cvid=dddf1e33ab0a45318ddff31539f0445a&aqs=edge.2.69i57j0l8.11403j0j1&FORM=ANSPA1&PC=U531#:~:text=https%3A//pubmed.ncbi.nlm.nih.gov/27830507 • https://www.bing.com/search?pglt=41&q=role+of+vitamin+a+in+vision&cvid=dddf1e33ab0a45318ddff31539f0445a&aqs=edge.2.69i57j0l8.11403j0j1&FORM=ANSPA1&PC=U531#:~:text=Vision%20%E2%80%93%20Introduction%20to%20%E2%80%A6-.https%3A//mtsu.pressbooks.pub/.../8f%2Dvision%2Dvitamins.-Web • https://youtu.be/wo7i9bFs4Bw
Second Messenger System	<ul style="list-style-type: none"> • Describe different types of second messengers 	<ul style="list-style-type: none"> • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 8, page 103- 105) • Harper's Illustrated Biochemistry 32th edition (Chapter 42, page 506 – 509) • Use digital library • https://www.britannica.com/ • https://youtu.be/PzA5Z3DXfrQ

Practicals				
Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Urine report	Write and interpret urine report	P	Skill Lab	OSPE
Lipid Profile	Write and interpret lipid profile	P	Skill Lab	OSPE
Revision of Spectrophotometer	Understand principle and uses of spectrophotometer	P	Skill Lab	OSPE

Basic and Clinical Sciences (Vertical Integration)
Case Based Learning Objectives (CBL)

Anatomy, Physiology & Biochemistry			
Clinical Themes			
Subjects	Topics	At the end of the session the student should be able to	Learning Domains
Anatomy	• Extra dural Haemorrhage (Norma lateralis & occipitalis)	Apply basic knowledge of subject to study clinical case.	C3
	• Occulo Motor nerve palsy (Extra ocular muscles)	Apply basic knowledge of subject to study clinical case.	C3
Biochemistry	• Night Blindness	Apply basic knowledge of subject to study clinical case.	C3

Pharmacology				
Theory				
Topic	At The End Of Lecture, Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Anti glaucoma drugs	• Recall the process of production and drainage of aqueous humor	C1	LGIS	MCQ
	• Outline the range of normal IOP	C1		
	• Enumerate main drug groups used in treatment of glaucoma	C1		
	• Briefly discuss IOP lowering mechanism of main groups	C2		

Medicine				
Theory				
Topic	At The End Of Lecture, Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Management Of Covid-19 Sense of Smell	• Discuss pathophysiology, signs and symptoms of patients with COVID-19.	C2	LGIS	MCQ
	• Discuss How will you investigate the patient with COVID-19.	C2		
	• Explain the management of COVID-19.	C2		

Sugery				
Theory				
Topic	At The End Of Lecture, Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Plastic surgery	<ul style="list-style-type: none"> Introduction to Plastic Surgery 	C2	LGIS	MCQ
Burn	<ul style="list-style-type: none"> Define Burn 	C1	LGIS	MCQ
	<ul style="list-style-type: none"> Types of Burns 	C2		
	<ul style="list-style-type: none"> Classification of Burns 			
	<ul style="list-style-type: none"> Percentages of Burn 			
Burn Managment	<ul style="list-style-type: none"> Approach toward Burn patient? 	C1	LGIS	MCQ
	<ul style="list-style-type: none"> Physiological changes because of Burn 	C2		
	<ul style="list-style-type: none"> Importance of Fluid Management in burn 			
Foot Ulcer	<ul style="list-style-type: none"> Classify Foot Ulcer 	C1	LGIS	MCQ
	<ul style="list-style-type: none"> Differentiate among Venous/Arterial /Traumatic and Diabetic Ulcer 	C2		
	<ul style="list-style-type: none"> Grading of Diabetic foot ulcers 	C3		
Skin ulcer	<ul style="list-style-type: none"> Classify Skin Ulcers 	C1	LGIS	MCQ
	<ul style="list-style-type: none"> Differentiate between marjolin ulcer, basal cell carcinoma and squamous cell carcinoma 	C2	LGIS	MCQ

Padiatrics				
Theory				
Topic	At the End Of Lecture, Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Preventive Pediatrics	<ul style="list-style-type: none"> Classify the degree of malnutrition in a malnourished child 	C1	LGIS	MCQs
	<ul style="list-style-type: none"> Differentiate between clinical features of kwashiorkor and marasmus on a patient 	C2	LGIS	MCQs

Radiology				
Theory				
Topic	At The End Of Lecture, Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
General radiologic concepts	<ul style="list-style-type: none"> Categorize different tissues from most to least opaque on x-ray including bone, soft tissue, air, metal, and fat. 	C2	LGIS	MCQs

ENT				
Theory				
Topic	At The End Of Lecture, Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Deafness	<ul style="list-style-type: none"> Know various cases of deafness 	C1	LGIS	MCQs,
	<ul style="list-style-type: none"> Understand the etiology, Pathology of various cases of deafness in external middle and internal ear and to know how to treat them. 	C2		
DNS & Rhinitis	<ul style="list-style-type: none"> Should define the turns 	C1	LGIS	MCQs,
	<ul style="list-style-type: none"> Know various causes of DNS and Rhinitis 	C1		
	<ul style="list-style-type: none"> Must be able to know treatment of all. 	C1		
	<ul style="list-style-type: none"> Know definition of polyp 	C1		

Nasal polyp	<ul style="list-style-type: none"> • Know different types of nasal Polyps, their etiology, pathophysiology and treatment 	C1	LGIS	MCQs,
	<ul style="list-style-type: none"> • Know latest management 	C1		
Diseases of External Nose	<ul style="list-style-type: none"> • Know various diseases of external nose, their etiology 	C1	LGIS	MCQs,
	<ul style="list-style-type: none"> • Pathophysiology and know how to treat them 	C1		
Ear Discharge	<ul style="list-style-type: none"> • Know Various cases of ear discharge 	C1	LGIS	MCQs,
	<ul style="list-style-type: none"> • Understand the etiology, Pathology of various cases of ear discharge in external and middle ear. 	C2		
	<ul style="list-style-type: none"> • Know how to treat these causes. 	C1		
Dizziness and Vertigo.	<ul style="list-style-type: none"> • Recognise signs and symptoms of acoustic neuroma. 	C1	LGIS	MCQs,
	<ul style="list-style-type: none"> • Identify treatment options and risks 	C2		
Facial fractures	<ul style="list-style-type: none"> • Classify facial fractures 	C1	LGIS	MCQs,
	<ul style="list-style-type: none"> • Enumerate treatment options for facial fractures 	C2		
Sinusitis	<ul style="list-style-type: none"> • Classify Sinusitis 	C1	LGIS	MCQs,
	<ul style="list-style-type: none"> • Enlist clinical features of sinusitis. 	C2		
Hearing Problems in Children	<ul style="list-style-type: none"> • Define deafness 	C1	LGIS	MCQs,
	<ul style="list-style-type: none"> • State the aetiology of hearing loss 	C1		
	<ul style="list-style-type: none"> • Elaborate the types of hearing loss 	C1		
	<ul style="list-style-type: none"> • Discuss the investigations of hearing loss 	C2		
	<ul style="list-style-type: none"> • Describe the treatment options for hearing loss patients. 	C2		

Eye				
Theory				
Topic	At The End Of Lecture, Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Refractive Errors	Refractive Errors	C1	LGIS	MCQs,
	<ul style="list-style-type: none">Types			
	<ul style="list-style-type: none">Treatment			
	ColourVison			
	<ul style="list-style-type: none">Types			
	<ul style="list-style-type: none">Inheritance			
	<ul style="list-style-type: none">Gender Predisposition			
	Night Blindness	C1		
	<ul style="list-style-type: none">Etiology			
	<ul style="list-style-type: none">Treatment			
Glaucoma	Glaucoma	C1	LGIS	MCQs,
	<ul style="list-style-type: none">What is Glaucoma			
	<ul style="list-style-type: none">Classification			
	<ul style="list-style-type: none">Treatment			
Cataract	Cataract	C1	LGIS	MCQs,
	<ul style="list-style-type: none">Define			
	<ul style="list-style-type: none">Types of cataract			
	<ul style="list-style-type: none">Surgical procedures			
	Ocular Trauma	C1		
	<ul style="list-style-type: none">Blunt			
	<ul style="list-style-type: none">Penetrating			

Ocular trauma & Ocular Procedures	<ul style="list-style-type: none">• Chemical Burns		LGIS	MCQs,
	<ul style="list-style-type: none">• Laceration			
	Ocular Procedures	C1		
	<ul style="list-style-type: none">• Cataract surgeries			
	<ul style="list-style-type: none">• Glaucoma Surgeries			
	<ul style="list-style-type: none">• Laser And refractive Surgeries			
Cornea	Corneal Ulcer	C1	LGIS	MCQs,
	<ul style="list-style-type: none">• Bacterial			
	<ul style="list-style-type: none">• Viral			
	<ul style="list-style-type: none">• Fungal			
Conjunctivitis	<ul style="list-style-type: none">• Define conjunctivitis	C1	LGIS	MCQs,
	<ul style="list-style-type: none">• Discuss the causes & types			
	<ul style="list-style-type: none">• Explain management in detail			

Spirally Integrated Courses / General Education Cluster (GEC) Courses

Content

- **Longitudinal Themes**
 - **The Holy Quran Translation**
 - **Pak Studies/Islamiyat**
 - **Family Medicine**
 - **Behavioral Sciences**
 - **Biomedical Ethics**
 - **Early Clinical Exposure (ECE)**
-

Family Medicine				
Theory				
Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Approach to a patient with earache	• Define earache.	C1	LGIS	MCQs
	• Discuss various types of earache.	C2		
	• Discuss the signs and symptoms of a patient with earache.	C2		
	• Discuss the workup for diagnosis of different types of earache.	C2		
	• Discuss management of Various types of earache.	C2		
	• Appreciate approach to a patient with earache.	C3		

Biomedical Ethics & Professionalism				
Theory				
Topics	At the end of session students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Ethical dilemmas practice involving breach in principle of justice	<ul style="list-style-type: none">Analyze ethical dilemmas in healthcare practice involving breach in principle of justice.Explain what procedures adopted to maintain the principle of justice in challenging situations.Identify situations in which a doctor may have to take decisions in the best interests of the patient considering the principle of justice	C3	Short video demonstration on violation of Ethical principle of beneficence and non-maleficence from suit CBEC Video resources Students' deliberations and reflections Reflective writing	<ul style="list-style-type: none">Assignment based assessment involving real life case scenarios under aggregate Marks. (Internal Assessment) <ul style="list-style-type: none">Assignment to be uploaded on LMS
		C2		
		C1		

Behavioural Sciences				
Theory				
Topic	At The End Of Lecture, Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
Perception	<ul style="list-style-type: none">To be able to define perception and basic perceptual abilities.To identify abnormalities of perceptions and their role in disease causation	C2	LGIS	MCQs,
Sleep and arousal	<ul style="list-style-type: none">To be able to understand the physiology of sleep. Disorders of sleep and their management	C2	LGIS	MCQs,

Block-III

Module No. 6 - Endocrinology

Duration 4 Week

Endocrinology Module Team

Module Name : Endocrinology Module
Duration of module : 04 Weeks
Coordinator : Dr. Sidra Hamid
Co-coordinator : Dr. Aneela Yasmeen
Reviewed by : Module Committee

Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Sidra Hamid (Assistant Professor of Physiology)
2.	Director DME	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Farzana Fatima
3.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf	3.	Co-coordinator	Dr. Sadia Baqir (Senior Demonstrator of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. (Demonstrator of Biochemistry)
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5.	Co-coordinator	Dr. Aneela Yasmeen (Senior Demonstrator of Physiology)
6.	Focal Person Anatomy Second Year MBBS	Dr. Maria Tasleem			
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.	DME Implementation Team	Prof. Dr. Ifra Saeed 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			
13.	Focal Person Quran Translation Lectures	Dr. Uzma Zafar			
14.	Focal Person Family Medicine	Dr. Sadia Khan			

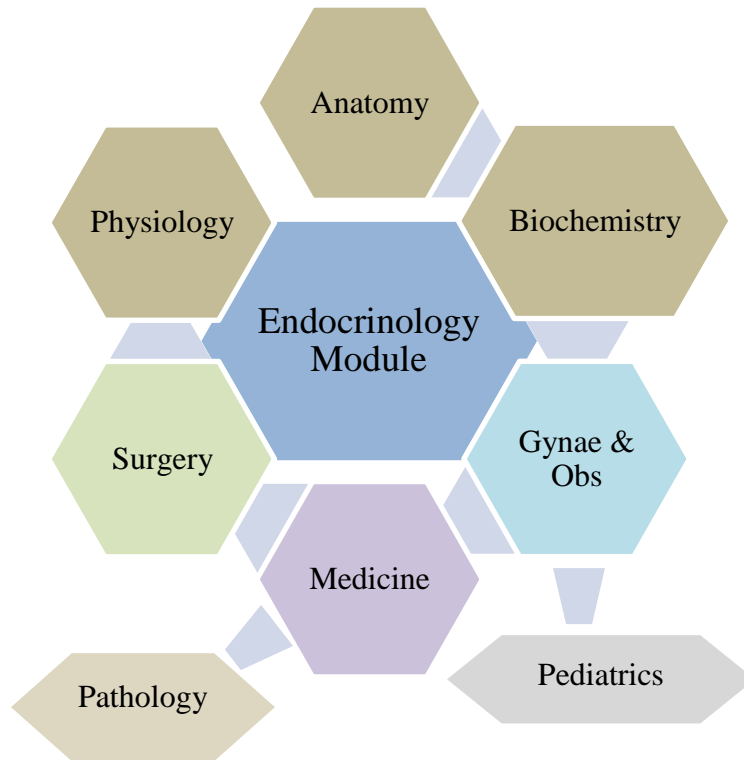
Themes								
Block	Subjects	Embryology	Histology	Histology Practical SKL. Lab.	Gross Anatomy	CBL	SDL	
III	<ul style="list-style-type: none">Anatomy	<ul style="list-style-type: none">Development of pituitary & pineal glandDevelopmnt of thyroid & parathyroid glandDevelopmnt adrenal gland and pancreas	<ul style="list-style-type: none">Pituitary & pineal glandThyroid & parathyroid glandAdrenal gland and pancreas	<ul style="list-style-type: none">Pituitary GlandThyroid & parathyroid glandAdrenal glandPancreas	<ul style="list-style-type: none">Bones of neck. Hyoid Bone & Cervical vertebraeFascias of NeckSuperficial structurs of neckLateral-cervical region (muscles & triangles)Latera-cervical-region (neurovascular organization)Interior-cervical region(muscles)Interior-cervical region (vessels of neck & cervical plexus)Submandular regionSoft palateDeep structures of neckRoot of neckThyroid&Parathyroid glandLarynxPharynxpancreas		<ul style="list-style-type: none">Bones of neckSCM region & superficial & deep fascialateral cervical regionAnterior Triangle of neck & its subdivisionsThyroid and para thyroid glandOnline SDL Evaluationsoft palate, larynx	
	<ul style="list-style-type: none">Physiology	<ul style="list-style-type: none">Classification of hormones, Mechanism of action of different hormones Physiology of Thyroid hormones, Adrenal hormones, Insulin and glucagon, Blood glucose regulation, Role of Calcium & Phosphate						
	<ul style="list-style-type: none">Biochemistry	<ul style="list-style-type: none">Classification of hormones, Thyroid hormones, Adrenal hormones, Insulin and glucagon, Blood glucose regulation, Calcium revisit						
	Spiral Courses							
	<ul style="list-style-type: none">The Holy Quran Translation	<ul style="list-style-type: none">						
	<ul style="list-style-type: none">Islamiayat	<ul style="list-style-type: none">						
	<ul style="list-style-type: none">Biomedical Ethics	<ul style="list-style-type: none">History of Medical Ethics						

	● Behavioral Sciences	● Professionalism In Healthcare
	● Radiology & Artificial Intelligence	● Basics of Radiology
	● Family Medicine	● Approach to patient diabetes mellitus
	Vertical Components	
	● Peads	● Growth problems due to Endocrine causes
	● Surgery	● Thyroid Disorders
	● Pathology	● Hypothyroidism and hyperthyroidism
	● Medicine	● Diabetes Mellitus
	● Obs & Gynae	● Endocrine Disorders in Pregnancy (Diabetes Mellitus, Thyroid Disorders)
	Early Clinical Exposure (ECE)	
	● Medicine	● Thyroid disorders ● Hyperthyroidism ● Hypothyroidism ● Cushing Syndrome
	● Surgery	● Thyroid Nodule ● Multi nodular Goiter ● CA Thyroid ● Graves Diseases
	● Eye	● Blindness ● Visual field defect ● Cataract
	● Otolaryngology	● Deafness ● Hearing tests ● Nasal Obstruction
	Clinical Themes	
	● Pathophysiology and Clinical Features of Diabetes Mellitus ● Hypothyroidism and Hyperthyroidism: Diagnosis and Management ● Adrenal Insufficiency: Causes and Treatment (e.g., Addison’s disease) ● Cushing’s Syndrome: Clinical Presentation and Management ● Pituitary Adenomas and Their Effects (e.g., prolactinoma) ● Pathophysiology of Hyperparathyroidism and Hypoparathyroidism ● Clinical Features and Management of Acromegaly ● Disorders of Growth Hormone: Dwarfism and Gigantism ● Mechanisms of Hypercalcemia and Hypocalcemia ● Pheochromocytoma: Diagnosis and Management	

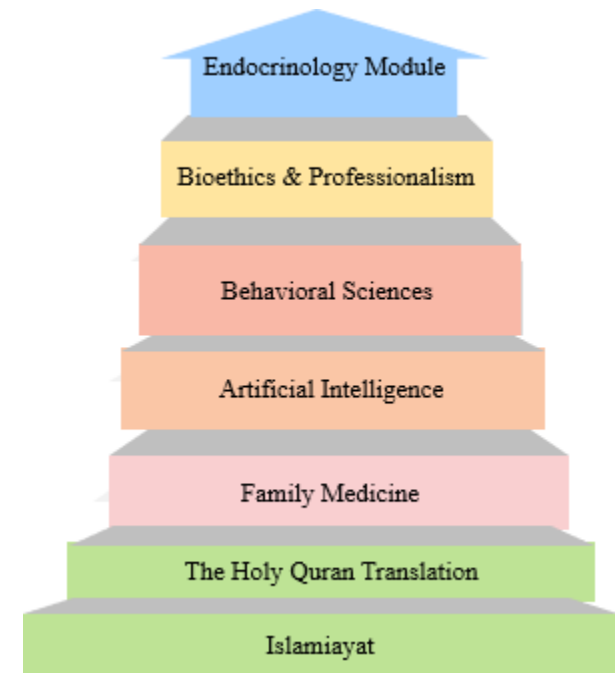
Implementation of Terms of Reference (TORS)

- 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 Endocrinology Module



Spiral / General Education Cluster Courses



Module No. 6 – Endocrinology

Rationale: The endocrine system is one of the two control systems of the body. It consists of many small organs responsible for the release of hormones. The endocrine system regulates metabolism, growth and development, tissue function and mood of a person. This system acts by means of hormones secreted into the blood to control process that require duration rather than speed e.g, metabolic activities and water and electrolyte balance. In this module we will concentrate on the integrating functions of the endocrine system and focus our teaching on the interaction of hormones and their integration to produce homeostatic regulation.

Module Outcomes

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

Knowledge

- The students should know the hormones and the organs producing them. They should know the chemical nature, biosynthesis and the physiological functions on their target organs. The student should understand & apply the concepts & principles of the basic sciences in context of clinical signs & symptoms to commonly occurring diseases of the endocrine.
- Used technology based Medical Education including **Artificial Intelligence**
- Appreciate concept and importance of **Family Medicine**
Biomedical Ethics & Professional Research

Skills

- Students should be able to recognize the histological features of all the endocrine glands under microscope.

Attitude

- Student should observe lab safety rules
Should have professional Attitude
-



Syllabus of Endocrinology Module (Module No. 6)

Anatomy				
Theory				
Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Histology of pituitary gland and pineal gland	<ul style="list-style-type: none"> Describe histological structure of pituitary and pineal gland Enumerate different cells present in both glands Discuss bio-physiological aspects related to their secretions Discuss the related clinical Read relevant research article Use digital library 	C2 C1 C2 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SEQS VIVA
Histology of thyroid and parathyroid glands	<ul style="list-style-type: none"> Describe histological structure of thyroid and parathyroid gland Enumerate different cells present in both glands Discuss bio-physiological aspects related to their secretions Discuss the related clinical Read relevant research article Use digital library 	C2 C1 C2 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SEQS VIVA
Histology of adrenal gland	<ul style="list-style-type: none"> Describe histological structure of adrenal gland. Enumerate different cells present in gland Discuss bio-physiological aspects related to secretions. Discuss the related clinical Read relevant research article Use digital library 	C2 C1 C2 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SEQS VIVA
Development of pituitary and pineal gland	<ul style="list-style-type: none"> Describe stages of development of pituitary and pineal glands Enumerate structures involved in development of glands Discuss congenital abnormalities related to development of glands Read relevant research article Use digital library 	C2 C1 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SEQS VIVA

Development of thyroid and parathyroid glands	<ul style="list-style-type: none"> Describe a stage of development of thyroid and parathyroid glands Enumerate structures involved in development of glands Discuss congenital abnormalities associated with their development Read relevant research article Use digital library 	C2 C1 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SEQS VIVA
Development of adrenal gland	<ul style="list-style-type: none"> Describe stages of development of adrenal glands Enumerate structures involved in the development of gland. Discuss congenital abnormalities associated with its development. Read relevant research article Use digital library 	C2 C1 C3 C3 C3	LGIS	<ul style="list-style-type: none"> MCQS SEQS VIVA

Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Bones of neck Hyoid Bone Cervical vertebrae	<ul style="list-style-type: none"> Describe the borders and surfaces of body and the two cornuas of hyoid bone. 	C2	Skill lab	MCQS SEQS VIVA OSPE
	<ul style="list-style-type: none"> Discuss the attachments on the hyoid bone. 	C2		
	<ul style="list-style-type: none"> Discuss the related applied of hyoid. 	C2		
	<ul style="list-style-type: none"> Describe anatomical features of cervical typical & atypical vertebrae . 	C2		
	<ul style="list-style-type: none"> Discuss the intervertebral joints& movements of cervical region of vertebral column. 	C2		
	<ul style="list-style-type: none"> Discuss the anatomical basis of cervical pain & injuries of cervical vertebral column 	C2		
	<ul style="list-style-type: none"> Read relevant research article 	C3		
	<ul style="list-style-type: none"> Use digital library. 	C3		
Fascias of Neck.	<ul style="list-style-type: none"> Understand cervical subcutaneous tissue & platysma. 	C2	Skill lab	MCQS SEQS VIVA OSPE
	<ul style="list-style-type: none"> Discuss the deep cervical fascia and the formation of layers due to its condensation. 	C2		
	<ul style="list-style-type: none"> Discuss the attachments and special features of the investing layer. 	C2		
	<ul style="list-style-type: none"> Describe the attachments and special features of prevertebral fascia. 	C2		
	<ul style="list-style-type: none"> Describe the attachments and special features of pretracheal fascia. 	C2		
	<ul style="list-style-type: none"> Discuss the carotid sheath formation, contents and relations. 	C2		
	<ul style="list-style-type: none"> Differentiate between the buccopharyngeal fascia and pharyngobasilar 	C2		

	fascia.			
	• Discuss related clinicals	C3		
	• Read relevant research article	C3		
	• Use digital library.	C3		
Superficial structures of the neck	• Discuss the location, attachments & actions of SCM & trapezius.	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Describe boundaries & location of posterior cervical region .	C2		
	• Discuss suboccipital triangle of neck & its contents.	C2		
	• Discuss related clinicals	C3		
	• Discuss the location, attachments & actions of SCM & trapezius .	C2		
	• Describe boundaries & location of posterior cervical region .	C2		
	• Discuss related clinicals	C2		
	• Read relevant research article	C3		
	• Use digital library.	C3		
lateral cervical region-(Muscles & triangles)	• Describe boundaries of posterior triangle.	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss the muscles in lateral cervical region.(splenius capitus ,levator scapulae ,middle scalene &posterior scalene.	C2		
	• Describe boundaries and contents of occipital triangle	C2		
	• Discuss boundaries and contents of subclavian triangle	C2		
	• Discuss related clinicals	C3		
	• Read relevant research article	C3		
	• Use digital library.	C3		
lateral cervical region-(Neuro vascular organization)	• Discuss arteries in lateral cervical region (supra scapular artery, 3rd part of subclavian artery ,	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss veins of lateral cervical region (EJV&subclavian vein)	C2		
	• Discuss nerve supply of lateral cervical region	C2		
	• Discuss lymphatic drainage in lateral cervical region.	C2		
	• Discuss related clinicals	C3		
	• Read relevant research article	C3		
	• Use digital library	C3		
Anterior cervical region-(Muscles)	• Discuss the Muscles in anterior cervical region (suprahyoid muscle group & infrahyoid muscle group)	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss the anatomical basis of torticollis	C3		
	• Discuss related clinicals.	C3		
	• Read relevant research article	C3		
	• Use digital library	C3		

Anterior Cervical Region- (Vessels of neck & Cervical plexus)	• Discuss arterial supply in anterior cervical region (carotid system of arteries)	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss venous drainage in anterior cervical region	C2		
	• Discuss formation of cervical plexus	C2		
	• Enumerate branches of cervical plexus	C2		
	• Discuss area of distribution	C2		
	• Describe clinical and applied anatomy	C3		
	• Read relevant research article	C3		
	• Use digital library	C3		
Submandibular Region	• Discuss the relations of digastric, mylohyoid and hyoglossus muscles.	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Describe the gross features, relations, blood supply, lymphatic drainage and nerve supply of submandibular salivary gland.	C2		
	• Describe the details of Wharton's duct, its opening and related clinicopathological conditions	C2		
	• Describe the gross features, relations, blood supply, lymphatic drainage and nerve supply of sublingual salivary gland.	C2		
	• Tabulate the comparison of three salivary glands.	C2		
	• Describe the connections and branches with area of supply by the sub-mandibular ganglion.	C2		
	• Read relevant research article	C3		
	• Use digital library	C3		
Soft Palate	• Discuss the anatomy of soft palate along with attachment of muscles and their actions.	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Describe boundaries of tonsillar fossa.	C2		
	• Discuss related clinicals	C3		
	• Read relevant research article	C3		
	• Use digital library	C3		
Deep structures of neck	• Discuss prevertebral muscles (ant.vertebral muscles & lateral vertebral muscles)	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss related clinicals.	C3		
	• Read relevant research article	C3		
	• Use digital library	C3		
Root of Neck	• Discuss arteries & veins in root of neck.	C2	Skill lab	MCQS SEQS
	• Discuss nerve supply in root of neck.	C2		
	• Discuss related clinicals.	C3		
	• Read a relevant research article	C3		

	<ul style="list-style-type: none"> • Use digital library 	C3		VIVA OSPE
Thyroid and para thyroid glands	<ul style="list-style-type: none"> • Discuss anatomy & functions of thyroid & parathyroid gland 	C2	Skill lab	MCQS SEQS VIVA OSPE
	<ul style="list-style-type: none"> • Discuss blood supply of thyroid gland 	C2		
	<ul style="list-style-type: none"> • Discuss lymphatic drainage & nerve supply of thyroid gland 	C2		
	<ul style="list-style-type: none"> • Discuss related clinicals. 	C3		
	<ul style="list-style-type: none"> • Read a relevant research article 	C3		
	<ul style="list-style-type: none"> • Use digital library 	C3		
larynx	<ul style="list-style-type: none"> • Discuss larynx in detail with its cartilages and muscles. 	C2	Skill lab	MCQS SEQS VIVA OSPE
	<ul style="list-style-type: none"> • Discuss blood supply of larynx 	C2		
	<ul style="list-style-type: none"> • Discuss functions of larynx 	C2		
	<ul style="list-style-type: none"> • Discuss trachea (revisit). 			
	<ul style="list-style-type: none"> • Discuss related clinicals 	C3		
	<ul style="list-style-type: none"> • Read a relevant research article 	C3		
Pharynx	<ul style="list-style-type: none"> • Use digital library 	C3	Skill lab	MCQS SEQS VIVA OSPE
	<ul style="list-style-type: none"> • Tabulate muscles of pharynx with origin, insertion, nerve supply and actions 	C2		
	<ul style="list-style-type: none"> • Discuss nerve supply of Pharynx 	C2		
	<ul style="list-style-type: none"> • Discuss blood supply of larynx 	C2		
	<ul style="list-style-type: none"> • Discuss esophagus (revisit) 	C2		
	<ul style="list-style-type: none"> • Discuss related clinicals 	C3		
	<ul style="list-style-type: none"> • Read a relevant research article 	C3		
Pancreas & Adrenal gland	<ul style="list-style-type: none"> • Use digital library 	C3	Skill lab	MCQS SEQS VIVA OSPE
	<ul style="list-style-type: none"> • Describe location of pancreas & Adrenal gland 	C2		
	<ul style="list-style-type: none"> • Enlist different parts of pancreas 	C2		
	<ul style="list-style-type: none"> • Describe relations of pancreas 	C2		
	<ul style="list-style-type: none"> • Discuss blood supply of pancreas 	C2		
	<ul style="list-style-type: none"> • Discuss the clinical Anatomy of pancreas 	C3		
	<ul style="list-style-type: none"> • Discuss related clinicals 	C3		
	<ul style="list-style-type: none"> • Read a relevant research article 	C3		
	<ul style="list-style-type: none"> • Use digital library 	C3		

Practicals				
Topic	Learning Objectives At the end of practical students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Histology of pituitary gland	• Identify the histological slide of the pituitary gland	P	Skill lab	OSPE VIVA
	• Illustrate the histological structure of the pituitary gland	C2		
	• Enlist two points of identification	C1		
Histology of adrenal gland	• Identify the histological slide of the adrenal gland	P	Skill Lab	OSPE VIVA
	• Illustrate the histological structure of the adrenal gland	C2		
	• Enlist two points of identification	C1		
Histology of thyroid and parathyroid gland	• Identify the histological slide of the thyroid and parathyroid gland	P	Skill lab	OSPE VIVA
	• Illustrate the histological structure of the thyroid and parathyroid gland	C2		
	• Enlist two points of identification	C1		
Histology of pancreas	• Identify the histological slide of the pancreas	P	Skill lab	OSPE VIVA
	• Illustrate the histological structure of the pancreas	C2		
	• Enlist two points of identification	C1		

Physiology						
Theory						
Topic	At The End Of Lecture Students Should Be Able To	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
Introduction to endocrinology & Signal transduction - I	<ul style="list-style-type: none"> Define endocrinology Describe several types of chemical messenger systems Enumerate endocrine glands in the body along with their secretions Compare two major control systems of the body Identify different locations and properties of hormone receptors Explain various intracellular signaling pathways after hormone receptor activation Describe various mechanism of actions of hormones in detail 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 16, Page 299) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 395) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 07,Page 231) (Chapter 23,Page 765) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 50,Page 817) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 75, Page 915-928) 	<ul style="list-style-type: none"> https://youtu.be/QLcxQT1fb_c https://www.khanacademy.org/science/ap-biology/cell-communication-and-cell-cycle/cell-communication/a/introduction-to-cell-signaling https://youtu.be/GHwMJnxaivy_s 	1. C1 2. C1 3. C1 4. C2 5.C1 6.C2 7.C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Hypothalamic–pituitary axis & GH	<ul style="list-style-type: none"> Recall the physiological anatomy and parts of pituitary gland Enumerate various cell types in pituitary gland along with their secretion and function Explain connections of anterior and posterior pituitary gland with hypothalamus Enlist various hormones secreted from anterior & posterior pituitary gland Describe metabolic functions of growth hormone Elaborate the role of growth 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 17, Page 307,313,324) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 407,411) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 07,Page 241) (Chapter 23,Page 775) 	<ul style="list-style-type: none"> https://www.mdpi.com/2072-6694/15/15/3820 https://youtu.be/fqz4WOWfz4Q https://resources.wfsahq.org/atotw/the-hypothalamic-pituitary-axis-part-1-anatomy-physiology/ 	C1 C1 C2 C1 C1 C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

	<ul style="list-style-type: none"> hormone in soft tissue and bone growth Discuss role of somatomedins in relation with growth hormone Explain regulation of secretion 	<ul style="list-style-type: none"> Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 51,Page 837) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 76, Page 929) 				
Introduction to endocrinology & Signal transduction- II	<ul style="list-style-type: none"> Classify hormones according to solubility and chemical nature Describe the nature& synthesis of hormones Differentiate different classes of hormones Describe the secretion, transport, feedback control& clearance of hormones <p>Differentiate different classes of hormones</p>	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 16, Page 301,304) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 395) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 07,Page 235,250) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 50,Page 817-831) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 75, Page 915-928) 	<ul style="list-style-type: none"> https://youtu.be/QLcxQT1fb_c https://www.khanacademy.org/science/ap-biology/cell-communication-and-cell-cycle/cell-communication/a/introduction-to-cell-signaling https://youtu.be/GHwMJnxaivs 	C2 C1 C2 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Abnormalities of growth hormone secretion	<ul style="list-style-type: none"> Enlist abnormalities of GH secretion Describe pan hypopituitarism Discuss in detail dwarfism & its treatment Explain gigantism & acromegaly Differentiate gigantism & acromegaly 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 18, Page 321-334) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 412) Human Physiology by Dee 	<ol style="list-style-type: none"> https://youtu.be/0GuRf5YPGiA https://www.ncbi.nlm.nih.gov/books/NBK278971/ 	C1 C1 C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

		Unglaub Silver thorn. 8 TH Edition.(Chapter 23,Page 775) <ul style="list-style-type: none"> Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 76, Page 936) 				
Insulin and glucagon: Structure and metabolic functions	<ul style="list-style-type: none"> Describe physiological anatomy of pancreas Describe chemistry, synthesis and transport of insulin Describe the factors which affect secretion of insulin Discuss mechanism of action of insulin Describe the physiological actions of insulin Explain mechanism of insulin secretion Describe mechanism of action of glucagon Discuss regulation of secretion of glucagon Explain the functions of glucagon 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 24, Page 429,445) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 440,446) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 22,Page 743) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 56,Page 902) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 79, Page 973,982) 	1. https://youtu.be/1c6a0BNsyek 2. https://www.britannica.com/science/insulin 3. https://www.medicalnewstoday.com/articles/316427#overview	C1 C1 C1 C2 C1 C2 C1 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Hormones of posterior pituitary gland (oxytocin and ADH)	<ul style="list-style-type: none"> Recall site of synthesis and secretion of posterior pituitary hormones Describe mechanism of action, stimuli for secretion, functions and regulation of ADH Discuss functions of oxytocin 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 17, Page 311) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 415) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 07,Page 241) Physiological Basis of Medical 	1. https://youtu.be/EGl1Oeetxpg 2. https://teachmephysiology.com/endocrine-system/hypothalamus-pituitary/posterior-pituitary/posterior-pituitary-gland/ 3. https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/posterior-pituitary-hormones	C1 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

		<p>Practice by Best & Taylor's.13th Edition. Section 07(Chapter 51,Page 849)</p> <ul style="list-style-type: none"> Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 76, Page 938) 				
Regulation of blood Glucose & Diabetes mellitus	<ul style="list-style-type: none"> Describe various factors regulating blood glucose concentration Discuss the importance of blood glucose regulation Discuss the pathophysiology of diabetes mellitus Explain the physiology of diagnosis of diabetes mellitus Explain the treatment of diabetes mellitus Differentiate between type I & type II diabetes mellitus Differentiate between diabetes mellitus & diabetes insipidus 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 24, Page 435-438,446-448) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 445) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 22,Page 743) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 56,Page 915) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 79, Page 983) 	<ol style="list-style-type: none"> https://youtu.be/KY85BUcQZew https://www.pharmaguideline.com/2022/01/hormonal-regulation-of-blood-glucose-level.html https://www.medicalnewstoday.com/articles/316427 	C1 C2 C2 C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Aldosterone and cortisol	<ul style="list-style-type: none"> Describe physiological anatomy of adrenal gland Enumerate its various hormones Describe synthesis, transport & metabolism of adrenocortical hormones Describe mechanism, physiological actions of aldosterone Explain the phenomenon of aldosterone escape Describe regulation of aldosterone secretion 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 20, Page 351-364) Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 427) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 765) 	<ol style="list-style-type: none"> https://youtube/2-Z3Q6BZuBY https://journals.physiology.org/doi/abs/10.1152/ajplegacy.1964.207.1.109 https://www.britannica.com/science/aldosterone 	C1 C1 C1 C1 C2 C1 C1 C2 C2 C1 C2 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

	<ul style="list-style-type: none"> • Enlist abnormalities of aldosterone secretion • Describe mechanism, physiological actions of cortisol Discuss anti stress and anti-inflammatory actions of cortisol • Describe regulation of cortisol secretion • Discuss functions of adrenal androgens • Describe the chemistry, secretion regulation of secretion of ACTH • Discuss the actions of ACTH 	<ul style="list-style-type: none"> • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 53,Page 866) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 78,Page 955) 				
Thyroid hormone: Production, storage and release	<ul style="list-style-type: none"> • Recall physiological anatomy of thyroid gland • Briefly explain secretions of thyroid gland • Compare the features of tri iodothyronine with thyroxine • Describe the steps of synthesis of thyroid hormone • Discuss in detail half-life, release, and transport of thyroid hormones • Explain regulation of secretion of thyroid hormone 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 19, Page 337) • Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 419) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 770) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 52,Page 855) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 77, Page 941) 	<ol style="list-style-type: none"> 1. https://youtu.be/afVX3mlNB80 2. https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/thyroid-hormone-release 3. https://byjus.com/biology/thyroid-hormone/ 	C1 C2 C2 C1 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Abnormalities of	<ul style="list-style-type: none"> • Discuss in detail Cushing's syndrome • Differentiate between Cushing disease and Cushing's syndrome • Discuss adrenogenital syndrome • Discuss the physiological anatomy of adrenal medulla 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 20, Page 364-373) • Physiology by Linda S. Costanzo 6th Edition. Endocrine 	<ol style="list-style-type: none"> 1. https://journals.physiology.org/doi/abs/10.1152/ajplegacy.1964.207.1.109 2. https://youtu.be/pSeU9Ei-3u4 3. https://medlineplus.gov/adrena 	C2 C2 C2 C2 C1 C1 C2	LGIS	MCQ SEQ VIVA VOCE

adrenocortical hormone	<ul style="list-style-type: none"> Enumerate various hormones secreted by adrenal medulla Describe the steps involved in synthesis of catecholamines Explain the function of catecholamines Discuss stress response Describe pheochromocytoma 	<p>Physiology (chapter 09, page 431,434,437)</p> <ul style="list-style-type: none"> Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 765) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 53,Page 874,875) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 78, Page 969) 	lglanddisorders.html	C2 C1		MCQ (LMS based Aseessment, MST based Assessment) OSPE
Physiological role of thyroid hormone	<ul style="list-style-type: none"> Describe mechanism of action of thyroid hormone Explain physiological functions of thyroid hormone 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 19, Page 343,345) Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 423) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 770) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 52,Page 855) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 77, Page 944) 	<ol style="list-style-type: none"> https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/thyroid-hormone-release https://youtu.be/IXjRsX50JB4 https://journals.physiology.org/doi/full/10.1152/physrev.2001.81.3.1097 	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Calcium homeostasis (Vitamin D, parathyroid	<ul style="list-style-type: none"> Discuss normal levels and metabolism of calcium and phosphate Describe the effects of hypocalcemia & hypercalcemia Explain the absorption and 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 21, Page 375-386) Physiology by Linda S. 	<ol style="list-style-type: none"> https://youtu.be/JYQL7JEsF_4 https://teachmephysiology.com/biochemistry/electrolytes/calcium-regulation 	C2 C1 C2 C2 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS

hormone and calcitonin)	<p>excretion of calcium and phosphate</p> <ul style="list-style-type: none"> • Discuss in detail bone physiology • Describe the steps involved the activation of Vitamin D • Discuss the actions of vitamin D • Describe the physiological anatomy of parathyroid glands • Describe the chemistry & regulation of secretion of parathyroid hormone • Explain the actions of parathyroid hormones • Describe functions and regulation of calcitonin 	<p>Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 448)</p> <ul style="list-style-type: none"> • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 777,779) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 54,Page 881,890) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 80, Page 991) 		<p>C1 C1 C2 C1</p>		<p>based Aseessment, MST based Assessment) OSPE</p>
Abnormalities of thyroid hormone (Goiter, hypothyroidism and hyperthyroidism)	<ul style="list-style-type: none"> • Enlist disorders of thyroid gland • Discuss in detail causes, symptoms, diagnosis and treatment of hyperthyroidism • Discuss in detail causes, symptoms, diagnosis and treatment of hypothyroidism • Compare hypothyroidism with hyperthyroidism • Differentiate between pituitary dwarfism and cretinism 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 19, Page 344,345) • Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 425) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 773) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 52,Page 861) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 77, Page 950) 	<ol style="list-style-type: none"> 1. https://www.hopkinsmedicine.org/health/conditions-and-diseases/disorders-of-the-thyroid 2. https://youtu.be/0vnpmaSI57c 	<p>C1 C2 C2 C2 C2</p>	<p>LGIS</p>	<p>MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE</p>
Bone pathophysiology	<ul style="list-style-type: none"> • Discuss in detail hypoparathyroidism • Describe hyperparathyroidism 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 21, 	<ol style="list-style-type: none"> 1. https://www.orthobullets.com/basic-science/9031/rickets 2. https://youtu.be/Srm2GH1dus 	<p>C2 C1 C1</p>		<p>MCQ SEQ</p>

(rickets, osteomalacia, osteoporosis, hypo and hyperparathyroidism)	<ul style="list-style-type: none"> Describe osteoporosis 	<p>Page 378,380,381,385,387)</p> <ul style="list-style-type: none"> Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 453) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 779) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 54, Page 881,890) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 80, Page 1003,1006) 	<p>g</p> <p>3. https://www.webmd.com/osteoporosis/what-is-osteomalacia</p>		LGIS	VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
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Topic	At The End Of Lecture Students Should Be Able To	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
Signal transduction & Growth hormone.	<ul style="list-style-type: none"> Define endocrinology Describe several types of chemical messenger systems Enumerate endocrine glands in the body along with their secretions Compare two major control systems of the body Identify different locations and properties of hormone receptors Explain various intracellular signaling pathways after hormone receptor activation Describe various mechanism of actions of hormones in detail 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 16, Page 299) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 395) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 07,Page 231) (Chapter 23,Page 765) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 50,Page 817) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 75, Page 915-928) 	<ul style="list-style-type: none"> https://youtu.be/QLcxQT1fb_c https://www.khanacademy.org/science/ap-biology/cell-communication-and-cell-cycle/cell-communication/a/introduction-to-cell-signaling https://youtu.be/GHwMJnxaiys 	<p>1. C1</p> <p>2. C1</p> <p>3. C1</p> <p>4. C2</p> <p>5.C1</p> <p>6.C2</p> <p>7.C1</p>	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Thyroid Hormones	<ul style="list-style-type: none"> Recall physiological anatomy of thyroid gland Briefly explain secretions of thyroid gland Compare the features of tri iodothyronine with thyroxine Describe the steps of synthesis of thyroid hormone Discuss in detail half-life, release, and transport of thyroid hormones <p>Explain regulation of secretion of thyroid hormone</p>	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 19, Page 337) Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 419) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 770) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 52,Page 855) <p>Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 77, Page 941)</p>	<ol style="list-style-type: none"> https://youtu.be/afVX3mlNB80 https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/thyroid-hormone-release https://byjus.com/biology/thyroid-hormone/ 	C1 C2 C2 C1 C2 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Insulin and Glucose Metabolism	<ul style="list-style-type: none"> Describe physiological anatomy of pancreas Describe chemistry, synthesis and transport of insulin Describe the factors which affect secretion of insulin Discuss mechanism of action of insulin Describe the physiological actions of insulin Explain mechanism of insulin secretion Describe mechanism of action of glucagon Discuss regulation of secretion of glucagon <p>Explain the functions of glucagon</p>	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 24, Page 429,445) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 440,446) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 22,Page 743) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 56,Page 902) <p>Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 79, Page 973,982)</p>	<ol style="list-style-type: none"> https://youtu.be/1c6a0BNsyek https://www.britannica.com/science/insulin https://www.medicalnewstoday.com/articles/316427#overview 	C1 C1 C1 C2 C1 C2 C2 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Bone pathophysiology (rickets, osteomalacia, osteoporosis, hypo and hyperparathyroidism)	<ul style="list-style-type: none"> • Discuss in detail hypoparathyroidism • Describe hyperparathyroidism Describe osteoporosis	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 21, Page 378,380,381,385,387) • Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 453) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 779) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 54, Page 881,890) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 80, Page 1003,1006) 	<ol style="list-style-type: none"> 1. https://www.orthobullets.com/basic-science/9031/rickets 2. https://youtu.be/Srm2GH1dusg 3. https://www.webmd.com/osteoporosis/what-is-osteomalacia 	C2 C1 C1	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Insulin and Glucagon:Structure and metabolic functions (Second week)	<ul style="list-style-type: none"> • Describe physiological anatomy of pancreas • Describe chemistry, synthesis and transport of insulin • Describe the factors which affect secretion of insulin • Discuss mechanism of action of insulin • Describe the physiological actions of insulin • Explain mechanism of insulin secretion • Describe mechanism of action of glucagon • Discuss regulation of secretion of glucagon Explain the functions of glucagon	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 24, Page 429,445) • Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 440,446) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 22,Page 743) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 56,Page 902) 4. Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 79, Page 973,982) 	<ol style="list-style-type: none"> 1. https://youtu.be/1c6a0BNsyek 2. https://www.britannica.com/science/insulin 3. https://www.medicalnewstoday.com/articles/316427#overview 	C1 C1 C1 C2 C1 C2 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Adrenal gland and its hormones (Fourth week)	<ul style="list-style-type: none"> Describe physiological anatomy of adrenal gland Enumerate its various hormones Describe synthesis, transport & metabolism of adrenocortical hormones Describe mechanism, physiological actions of aldosterone Explain the phenomenon of aldosterone escape Describe regulation of aldosterone secretion Enlist abnormalities of aldosterone secretion Describe mechanism, physiological actions of cortisol Discuss anti stress and anti-inflammatory actions of cortisol Describe regulation of cortisol secretion Discuss functions of adrenal androgens Describe the chemistry, secretion regulation of secretion of ACTH Discuss the actions of ACTH 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 20, Page 351-364) Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 427) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 765) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 53,Page 866) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 78,Page 955) 	<ol style="list-style-type: none"> https://youtube/2-Z3Q6BZuBY https://journals.physiology.org/doi/abs/10.1152/ajplegacy.1964.207.1.109 https://www.britannica.com/science/aldosterone 	C1 C1 C1 C1 C2 C1 C1 C2 C2 C1 C2 C1 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
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Topic	At The End Of Lecture Students Should Be Able To	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
(ON CAMPUS) Regulation of blood Glucose & Diabetes mellitus	<ul style="list-style-type: none"> Describe various factors regulating blood glucose concentration Discuss the importance of blood glucose regulation Discuss the pathophysiology of diabetes mellitus Explain the physiology of diagnosis of diabetes mellitus Explain the treatment of diabetes 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 24, Page 435-438,446-448) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 445) Human Physiology by Dee 	<ol style="list-style-type: none"> https://youtu.be/KY85BUcQZew https://www.pharmaguideline.com/2022/01/hormonal-regulation-of-blood-glucose-level.html https://www.medicalnewstoday.com/article 	C1 C2 C2 C2 C2 C2 C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS

	mellitus <ul style="list-style-type: none"> • Differentiate between type I & type II diabetes mellitus • Differentiate between diabetes mellitus & diabetes insipidus 	Unglaub Silver thorn. 8 TH Edition.(Chapter 22,Page 743) <ul style="list-style-type: none"> • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 56,Page 915) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 79, Page 983) 	s/316427			based Aseessment,MS T based Assessment) OSPE SDL Evaluation
Abnormalities of adrenocortical hormone	<ul style="list-style-type: none"> • Discuss in detail Cushing's syndrome • Differentiate between Cushing disease and Cushing's syndrome • Discuss adrenogenital syndrome • Discuss the physiological anatomy of adrenal medulla • Enumerate various hormones secreted by adrenal medulla • Describe the steps involved in synthesis of catecholamines • Explain the function of catecholamines • Discuss stress response • Describe pheochromocytoma 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 20, Page 364-373) • Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 431,434,437) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 765) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 53,Page 874,875) Textbook of Medical Physiology by Guyton & Hall.14 th Edition..Section 14. (Chapter 78, Page 969)	https://journals.physiology.org/doi/abs/10.1152/ajplegacy.1964.207.1.109 https://youtu.be/pSeU9Ei-3u4 https://medlineplus.gov/adrenalglanddisorders.html	C2 C2 C2 C2 C1 C1 C2 C2 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment,MS T based Assessment) OSPE SDL Evaluation
Bone pathophysiology (rickets, osteomalacia, osteoporosis, hypo and hyperparathyroidism)	<ul style="list-style-type: none"> • Discuss in detail hypoparathyroidism • Describe hyperparathyroidism • Describe osteoporosis 	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 21, Page 378,380,381,385,387) • Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 453) • Human Physiology by Dee 	https://www.orthobullets.com/basic-science/9031/rickets https://youtu.be/Srm2GH1dusg https://www.webmd.com/osteoporosis/what-is-osteomalacia	C2 C1 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based

		<p>Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 779)</p> <ul style="list-style-type: none"> Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 54, Page 881,890) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 80, Page 1003,1006) 				<p>Aseessment,MS T based Assessment) OSPE SDL Evaluation</p>
<p>(OFF CAMPUS)</p> <p>Hypothalamic–pituitary axis & GH</p>	<ul style="list-style-type: none"> Recall the physiological anatomy and parts of pituitary gland Enumerate various cell types in pituitary gland along with their secretion and function Explain connections of anterior and posterior pituitary gland with hypothalamus Enlist various hormones secreted from anterior & posterior pituitary gland Describe metabolic functions of growth hormone Elaborate the role of growth hormone in soft tissue and bone growth Discuss role of somatomedins in relation with growth hormone Explain regulation of secretion 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 17, Page 307,313,324) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 407,411) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 07,Page 241) (Chapter 23,Page 775) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 51,Page 837) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 76, Page 929) 	<p>https://www.mdpi.com/2072-6694/15/15/3820</p> <p>https://youtu.be/fqz4WOWfz4Q</p> <p>https://resources.wfsahq.org/atotw/the-hypothalamic-pituitary-axis-part-1-anatomy-physiology/</p>	<p>1. C1</p> <p>2. C1</p> <p>3. C2</p> <p>4. C1</p> <p>5. C1</p> <p>6. C2</p> <p>7. C2</p> <p>8. C2</p>	<p>SDL</p>	<p>MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment,MS T based Assessment) OSPE SDL Evaluation</p>
<p>Introduction to endocrinology & Signal transduction</p>	<ul style="list-style-type: none"> Classify hormones according to solubility and chemical nature Describe the nature& synthesis of hormones Differentiate different classes of hormones Describe the secretion, transport, 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 16, Page 301,304) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 	<p>https://youtu.be/QLcxQT1fb_c</p> <p>https://www.khanacademy.org/science/ap-biology/cell-communication-and-cell-cycle/cell-</p>	<p>C2</p> <p>C1</p> <p>C2</p> <p>C1</p> <p>C2</p>	<p>SDL</p>	<p>MCQ SEQ VIVA VOCE MCQ (LMS</p>

	<p>feedback control& clearance of hormones</p> <ul style="list-style-type: none"> Differentiate different classes of hormones 	<p>395)</p> <ul style="list-style-type: none"> Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 07,Page 235,250) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 50,Page 817-831) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 75, Page 915-928) 	communication/a/introduction-to-cell-signaling https://youtu.be/GHwMJnxaiys			<p>based Aseessment,MS T based Assessment) OSPE SDL Evaluation</p>
Insulin and glucagon:	<ul style="list-style-type: none"> Describe physiological anatomy of pancreas Describe chemistry, synthesis and transport of insulin Describe the factors which affect secretion of insulin Discuss mechanism of action of insulin Describe the physiological actions of insulin Explain mechanism of insulin secretion Describe mechanism of action of glucagon Discuss regulation of secretion of glucagon Explain the functions of glucagon 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 24, Page 429,445) Physiology by Linda S. Costanzo 6th Edition.Endocrine Physiology (chapter 09, page 440,446) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 22,Page 743) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 56,Page 902) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 79, Page 973,982) 	<p>1. https://youtu.be/1c6a0BNsyek</p> <p>2. https://www.britannica.com/science/insulin</p> <p>3. https://www.medicalnewstoday.com/articles/316427#overview</p>	<p>C1 C1 C1 C2 C1 C2 C2</p>	SDL	<p>MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment,MS T based Assessment) OSPE SDL Evaluation</p>
	<ul style="list-style-type: none"> Describe physiological anatomy of adrenal gland Enumerate its various hormones Describe synthesis, transport & metabolism of adrenocortical hormones 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 20, Page 351-364) Physiology by Linda S. Costanzo 6th Edition. Endocrine 	<p>1. https://youtube/2-Z3Q6BZuBY https://journals.physiology.org/doi/abs/10.1152/ajplegacy.1964.207.1.109</p>	<p>C1 C1 C1 C1 C2 C1</p>	SDL	<p>MCQ SEQ VIVA VOCE MCQ (LMS</p>

Aldosterone and cortisol	<ul style="list-style-type: none"> Describe mechanism, physiological actions of aldosterone Explain the phenomenon of aldosterone escape Describe regulation of aldosterone secretion Enlist abnormalities of aldosterone secretion Describe mechanism, physiological actions of cortisol Discuss anti stress and anti-inflammatory actions of cortisol Describe regulation of cortisol secretion Discuss functions of adrenal androgens Describe the chemistry, secretion regulation of secretion of ACTH Discuss the actions of ACTH 	<p>Physiology (chapter 09, page 427)</p> <ul style="list-style-type: none"> Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 765) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 53,Page 866) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 78,Page 955) 	https://www.britannica.com/science/aldosterone	C1 C2 C2 C1 C2 C1 C2		based Aseessment,MS T based Assessment) OSPE SDL Evaluation
Thyroid hormone:	<ul style="list-style-type: none"> Recall physiological anatomy of thyroid gland Briefly explain secretions of thyroid gland Compare the features of tri iodothyronine with thyroxine Describe the steps of synthesis of thyroid hormone Discuss in detail half-life, release, and transport of thyroid hormones Explain regulation of secretion of thyroid hormone 	<ul style="list-style-type: none"> Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 19, Page 337) Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 419) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 770) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 52,Page 855) Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 77, Page 941) 	https://youtu.be/afVX3mlNB80 https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/thyroid-hormone-release https://byjus.com/biology/thyroid-hormone/	C1 C2 C2 C1 C2 C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment,MS T based Assessment) OSPE SDL Evaluation
	<ul style="list-style-type: none"> Enlist disorders of thyroid gland 	<ul style="list-style-type: none"> Ganong's Review of Medical 	https://www.hopkinsm	C1		

Abnormalities of thyroid hormone (Goiter, hypothyroidism and hyperthyroidism)	<ul style="list-style-type: none"> • Discuss in detail causes, symptoms, diagnosis and treatment of hyperthyroidism • Discuss in detail causes, symptoms, diagnosis and treatment of hypothyroidism • Compare hypothyroidism with hyperthyroidism • Differentiate between pituitary dwarfism and cretinism 	Physiology.25 TH Edition.Section 03 (Chapter 19, Page 344,345) <ul style="list-style-type: none"> • Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 425) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 773) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 52,Page 861) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 77, Page 950) 	edicine.org/health/conditions-and-diseases/disorders-of-the-thyroid https://youtu.be/0vnpmasI57c	C2 C2 C2 C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment,MS T based Assessment) OSPE SDL Evaluation
Calcium homeostasis (Vitamin D, parathyroid hormone and calcitonin)	<ul style="list-style-type: none"> • Discuss normal levels and metabolism of calcium and phosphate • Describe the effects of hypocalcemia & hypercalcemia • Explain the absorption and excretion of calcium and phosphate • Discuss in detail bone physiology • Describe the steps involved the activation of Vitamin D • Discuss the actions of vitamin D • Describe the physiological anatomy of parathyroid glands • Describe the chemistry & regulation of secretion of parathyroid hormone • Explain the actions of parathyroid hormones Describe functions and regulation of calcitonin	<ul style="list-style-type: none"> • Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 21, Page 375-386) • Physiology by Linda S. Costanzo 6th Edition. Endocrine Physiology (chapter 09, page 448) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.(Chapter 23,Page 777,779) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 07(Chapter 54,Page 881,890) Textbook of Medical Physiology by Guyton & Hall.14 th Edition..Section 14. (Chapter 80, Page 991)	1. https://youtu.be/JYQL7JEsF_4 2. https://teachmephysiology.com/biochemist/ry/electrolytes/calcium-regulation	C2 C1 C2 C2 C1 C2 C1 C1 C2 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment,MS T based Assessment) OSPE SDL Evaluation

Practicals					
Topic	At The End Of Lecture Students Should Be Able To	References	Learning Resources	Learning Domains	Learning Strategy
Examination of pupillary reaction	<ul style="list-style-type: none"> • Principle • Procedure • Precautions • Clinical correlation OF Pupillary Reactions 	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	A3/P3/C1	Practicals/skill lab	Viva Voce Ospe Video Assisted Assessment
Checking for color vision	<ul style="list-style-type: none"> • Apparatus identification • Principle • Procedure • Precautions • Clinical correlation for color vision 	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	A3/P3/C1	Practicals/skill lab	Viva Voce Ospe Video Assisted Assessment
Revision of practical	<ul style="list-style-type: none"> • Revision 	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	A3/P3	Practicals/skill lab	Viva Voce Ospe Video Assisted Assessment

Biochemistry				
Theory				
Topic	Learning Objectives At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Classification and mechanism of action of hormones	Classify hormones Explain the mechanism of action of hormones	C2 C2	LGIS	MCQs, SAQs & Viva
Thyroxin	Describe nature, formation and mechanism of action of thyroxin Discuss related clinical disorders	C2 C3	LGIS	MCQs, SAQs & Viva
Parathyroid and Calcitonin	Discuss role of various hormones acting on calcium and phosphate metabolism Discuss related clinical disorders	C2 C3	LGIS	MCQs, SAQs & Viva
Adrenal cortical hormones	Describe synthesis, mechanism of action and functions of aldosterone, cortisol and adrenal androgens Discuss related clinical disorders	C2 C3	LGIS	MCQs, SAQs & Viva
Adrenal medullary hormones	Describe mechanism of action and role of adrenal medullary hormones Discuss related diseases	C2 C3	LGIS	MCQs, SAQs & Viva
Insulin and glucagon	Explain formation, mechanism of action and role of insulin and glucagon Discuss related diseases	C2	LGIS	MCQs, SAQs & Viva

		C3		
Blood glucose regulation	Describe regulation of normal plasma glucose level Explain hypoglycemia	C2 C3	LGIS	MCQs, SAQs & Viva

Topic	At The End Of Tutorial Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Classification of endocrine hormones,	• Classify Endocrine hormones	C1	SGD	MCQs SAQs Viva
	• Discuss the mechanism of action of endocrine hormones	C2		
Adrenocortical Hormones	• Elaborate formation, functions & related disorders of adrenocortical hormones	C2	SGD	MCQs SAQs Viva

Topic	At The End Of SDL Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool	Learning Resources
Classification & Mechanism of action of Endocrine Hormones	• Classify Endocrine Hormones	C1	SDL	MCQs SAQs Viva	1. Harper's Illustrated Biochemistry 32nd edition, chapter 41, pages 482-484 2. Lippincott Illustrated Reviews, Biochemistry, 8 th Edition, chapter 18, pages 265-266 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6761896/ https://www.youtube.com/watch?v=KSclrkk_Ako
	• Discuss the Mechanism of action of various Endocrine Hormones	C2			

Formation & Mechanism of action of Thyroid Hormone	<ul style="list-style-type: none"> Elaborate the nature, formation, mechanism of action and related diseases of Thyroxin 	C2	SDL	MCQs SAQs Viva	<ol style="list-style-type: none"> Harper's Illustrated Biochemistry 32nd edition, chapter 41, pages 492-493 and 498 Lippincott Illustrated Reviews, Biochemistry, 8th Edition, chapter 29, pages 452-454 https://www.nature.com/articles/boneres201311 https://www.youtube.com/watch?v=cDGmsR2ZILE
Synthesis & Mechanism of Action of Adrenocortical Hormones	<ul style="list-style-type: none"> Describe synthesis, mechanism of action and functions of Aldosterone, Cortisol and Adrenal androgens Discuss related clinical disorders 	C2	SDL	MCQs SAQs Viva	<ol style="list-style-type: none"> Harper's Illustrated Biochemistry 32nd edition, chapter 41, pages 485-488, 491- 492, and 495-496, 498-499 Lippincott Illustrated Reviews, Biochemistry, 8th Edition, chapter 18, pages 262-266 https://www.ncbi.nlm.nih.gov/books/NBK470339/
	<ul style="list-style-type: none"> Describe mechanism of action and role of Adrenal Medullary Hormones Discuss related diseases 	C2			

					https://www.youtube.com/watch?v=JII5N2N4d-k https://www.sciencedirect.com/topics/medicine-and-dentistry/adrenal-medulla https://www.youtube.com/watch?v=afzWLmd72Rk
Synthesis & Mechanism of Action of Insulin & Glucagon	<ul style="list-style-type: none"> Explain formation, mechanism of action and role of Insulin and Glucagon Discuss related diseases 	C2	SDL	MCQs SAQs Viva	1. Harper's Illustrated Biochemistry 32nd edition, chapter pages 493-494 2. Lippincott Illustrated Reviews, Biochemistry, 8 th Edition, chapter 23, pages 341-354 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6515536/ https://www.youtube.com/watch?v=1c6a0BNsyek https://www.youtube.com/watch?v=-3J6QRMerQE

Glucose Tolerance Test Curves Hypoglycemia Diabetic Ketoacidosis & Hyperosmolar Hyperglycemic State Online Clinical Evaluation	<ul style="list-style-type: none">• Normal & abnormal curves of glucose tolerance test and factors effecting it. Interpretation of GTT curves for Diabetes Mellitus• Hypoglycemia, Hyperglycemia & Diabetic ketoacidosis	C2	SDL	MCQs SAQs Viva	<ol style="list-style-type: none">1. Harper’s Illustrated Biochemistry 32nd edition, chapter pages 719-720, 136-138 & 469-4702. Lippincott Illustrated Reviews, Biochemistry, 8th Edition, chapters 23 & 25, pages 350-354 & 375-387 <p>https://www.ncbi.nlm.nih.gov/books/NBK532915/</p> <p>https://www.youtube.com/watch?v=SRZIYdQWO3g</p> <p>https://www.ncbi.nlm.nih.gov/books/NBK279052/</p> <p>https://www.youtube.com/watch?v=jCf7W1U4JKE</p> <p>https://www.ncbi.nlm.nih.gov/books/NBK534841/</p>
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Practicals				
Topic	At The End Of Practical Students Should Be Able To	C/P/A	Teaching Strategy	Assessment Tool
Estimation of Blood Glucose	<ul style="list-style-type: none"> Perform estimation of glucose by spectrophotometer 	P	Skill lab	OSPE
GTT	<ul style="list-style-type: none"> Explain the procedure of practical, normal & abnormal curves of glucose and factors effecting it Interpret the result of GTT 	P	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
Anatomy	• Multi Nodular Goitre with Hypothyroidism	Apply basic knowledge of subject to study clinical case.	C3
	• Torticollis	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• Adrenocortical Hormone	Apply basic knowledge of subject to study clinical case	C3
Biochemistry	• Thyrotoxicosis	Apply basic knowledge of subject to study clinical case.	C3
	• Addison's Disease	Apply basic knowledge of subject to study clinical case	C3

Pathology				
Theory				
Topic	At the end of this LGIS students should be able to:	Learning Domain	Teaching Strategy	Assessment Tool
Pituitary disorders	• Discuss pathogenesis of pituitary adenomas	C2	LGIS	MCQ's
	• Causes of hypopituitarism and posterior pituitary syndromes	C2		
Calcium metabolism disorders	• Describe pathogenesis of Tetany	C2	LGIS	MCQ's
	• Causes of Hypoparathyroidism and	C2		
	• Hyperparathyroidism (primary and secondary)	C2		
	• Describe the pathogenesis of Rickets and	C2		
Adrenocortical disorders	• Osteomalacia	C2	LGIS	MCQ's
	• Describe the pathological features of Osteoporosis and osteopetrosis	C2		
	• Define and discuss pathogenesis of	C2		
	• Addison's disease and Conn's syndrome	C2	LGIS	MCQ's
	• Describe the pathogenesis of Cushing syndrome	C2		

	<ul style="list-style-type: none">Explain dexamethasone suppression test and its role in diagnosis	C2		
Diabetesmellitus	<ul style="list-style-type: none">Define diabetes	C1	LGIS	MCQ's
	<ul style="list-style-type: none">Classify diabetes	C2		
	<ul style="list-style-type: none">Discuss pathogenesis of type I and type II diabetes mellitus	C2		
Diagnosis of Thyroid	<ul style="list-style-type: none">Define hypothyroidism and hyperthyroidism	C1	LGIS	MCQ's
	<ul style="list-style-type: none">Extract lab diagnosis of hypothyroidism and hyperthyroidism	C2		
	<ul style="list-style-type: none">Describe clinical features of hyper and hypothyroidism	C2		

Medicine				
Theory				
Topic	At the end of this LGIS students of should be able to:	Learningg Domain	TeachingStrategy	Assessment Tool
Hypothyroidism and hyperthyroidism	<ul style="list-style-type: none">Discuss discuss pathophysiology, clinical manifestations of hypothyroidism and hyperthyroidism	C2	LGIS	MCQ
	<ul style="list-style-type: none">Workup and management	C2		
Hypocalcemia and hypercalcemia	<ul style="list-style-type: none">Discuss pathophysiology, clinical manifestations of hypocalcemia and hypercalcemia	C2	LGIS	MCQ
	<ul style="list-style-type: none">Workup and management	C2		
Diabetes mellitus	<ul style="list-style-type: none">Discuss pathophysiology, clinical manifestations of type I and type II diabetes mellitus	C2	LGIS	MCQ
	<ul style="list-style-type: none">Discuss Workup and management	C2		
Syndrome of inappropriate ADH secretion (SIADH).	<ul style="list-style-type: none">Define and discuss pathophysiology	C2	LGIS	MCQs
	<ul style="list-style-type: none">Discuss the causes	C2		
	<ul style="list-style-type: none">Describe clinical features	C2		
	<ul style="list-style-type: none">Describe the management	C2		
Cushing syndrome	<ul style="list-style-type: none">Define and discuss pathophysiology	C1	LGIS	MCQs
	<ul style="list-style-type: none">Discuss the causes	C2		
	<ul style="list-style-type: none">Describe clinical features	C2		
	<ul style="list-style-type: none">Describe the management	C2		

Surgery				
Theory				
Topic	At the end of this LGIS students of should be able to:	Learning Domain	TeachingStrategy	AssessmentTool
Thyroid	<ul style="list-style-type: none">Enlist swellings infront of neck	C1	LGIS	MCQ
	<ul style="list-style-type: none">How to differentiate swellings in neck	C2		
	<ul style="list-style-type: none">Explain What is Hyperthyroidism	C2		
	<ul style="list-style-type: none">What is Hypothyroidism	C2		
	<ul style="list-style-type: none">Appreciate MNG	C2		
	<ul style="list-style-type: none">Appreciate Solitary Nodule	C2		
	<ul style="list-style-type: none">Appreciate Toxic Nodule	C2		
	<ul style="list-style-type: none">Outline the investigations for Thyroid pathologies	C2		
	<ul style="list-style-type: none">Outline the Management of different thyroidPathologies	C2		
AdrenalTumours	<ul style="list-style-type: none">Enlist hormones secreted by Adrenal Gland	C2	LGIS	MCQ
	<ul style="list-style-type: none">Describe Clinical Manifestations of differentadrenal disease	C2		
	<ul style="list-style-type: none">Outline the management plan	C2		
Diabetic foot	<ul style="list-style-type: none">Describe Diabetic Foot	C2	LGIS	MCQ
	<ul style="list-style-type: none">Classify Diabetic foot	C1		
	<ul style="list-style-type: none">Describe Pathophysiology of Diabetic foot	C2		
	<ul style="list-style-type: none">Outline Management of Diabetic foot	C2		

Gynecology & Obstetrics				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	TeachingStrategy	AssessmentTool
Endocrine disorders in pregnancy (diabetes Mellitus, thyroid disorders)	Diabetes Mellitus: <ul style="list-style-type: none">Know why pregnancy is a diabetogenic state	C2	LGIS	MCQs
	<ul style="list-style-type: none">Define gestational diabetes mellitus (GDM)	C1		
	<ul style="list-style-type: none">Correlate clinical features with pathophysiology of GDM	C2		
	<ul style="list-style-type: none">Outline brief management plan for these conditions	C2		
	<ul style="list-style-type: none">Know the methods for screening of diabetes in pregnancy	C2		
	Thyroid disorders: <ul style="list-style-type: none">	C1		
	<ul style="list-style-type: none">Know pathophysiology of common thyroid disorders	C2		
	during pregnancy			
	<ul style="list-style-type: none">Understand clinical presentation of thyroid disorders inpregnancy	C2		
	<ul style="list-style-type: none">Comprehend effects of thyroid disorders on mother andfetus	C2		
Primary amenorrhoea/ delayed puberty	<ul style="list-style-type: none">Define primary amenorrhea, secondary amenorrhea andoligomenorrhoea.	C1	LGIS	MCQs
	<ul style="list-style-type: none">Enumerate the causes of amenorrhea:<ul style="list-style-type: none">HypothalamicPituitaryOvarianEndometrialStructural	C1		
	<ul style="list-style-type: none">Understand physical and hormonal changes at puberty /secondary sexual characteristics	C2		
	<ul style="list-style-type: none">Know basic pathophysiology of disorders of puberty<ul style="list-style-type: none">Precocious pubertyDelayed puberty	C2		
	<ul style="list-style-type: none">Identify clinical features of precocious puberty	C1		

Pediatrics				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Endocrine Problems	• Differentiate between the clinical features of hypothyroidism	C2	LGIS	MCQs
	• Interpret the investigations required for diagnosis of hypothyroidism	C2	LGIS	MCQs

Spirally Integrated Courses / General Education Cluster (GEC) Courses

Content

- **Longitudinal Themes**
 - **The Holy Quran Translation**
 - **Pak Studies/Islamiyat**
 - **Behavioral Sciences**
 - **Biomedical Ethics**
 - **Early Clinical Exposure (ECE)**
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Radiology & Artificial Intelligence				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Basics of Radiology	<ul style="list-style-type: none">• Categorize different tissues from most to least opaque on x-ray including: bone,soft tissue, air, metal, and fat	C2	LGIS	MCQs
	<ul style="list-style-type: none">• Distinguish between the different types of contrast used in imaging exams and thepotential diagnostic benefits of each	C2	LGIS	MCQs

Behavioral Sciences				
Theory				
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Psychosocial Assessment	<ul style="list-style-type: none">• To be able to do a detailed interview keeping in mind the psychological and socialaspects in predisposing, precipitating and maintaining diseases.	C2	LGIS	MCQs
Psychosocial Assessment	<ul style="list-style-type: none">• To be able to do a detailed interview keeping in mind the psychological and socialaspects in predisposing, precipitating and maintaining diseases.	C2	LGIS	MCQs

Biomedical Ethics & Professionalism					
Theory					
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool	
History of Medical Ethics	<p>Discussion on Health Research ethics focusing;</p> <ul style="list-style-type: none"> •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. <ul style="list-style-type: none"> - Interpretation research ethics for; - Informed consent and confidentiality in research HR 	<p>At the end of the session students should be able to;</p> <ul style="list-style-type: none"> • 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 	<p>LGIS</p> <p>1hr contact session in 2-4 parallel classes,</p> <p>Conducted by Senior faculty.</p>	<p>1 MCQs of level C1 to C3 will cover this session teachings in relevant block examination in pool of total 04 MCQs.</p> <p>Result / marks obtained will contribute towards Internal assessment (IA) in 1st Prof. MBBS exam.</p>	<p>Guidelines and Teachers Handbook for Introducing Bioethics to Medical and Dental Students</p> <p>http://nbc-pakistan.org.pk/assets/may-16-bioethics-facilitator-book---may-16%2C-2017.pdf The Nuremberg Code:</p> <p>http://www.hhs.gov/ohrp/archives/nurcode.html</p> <p>10 WMA Declaration of Helsinki:</p> <p>http://www.wma.net/en/30publications/10policies/b3/</p> <p>CIOMS Guidelines:</p> <p>http://www.cioms.ch/publications/layout_guide2002.pdf .</p> <p>Nuffield Council on Bioethics Guidelines:</p> <p>http://www.sirc.org/news/nuffield.shtml</p>

➤ Section-IX

Spirally Integrated Courses in 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.

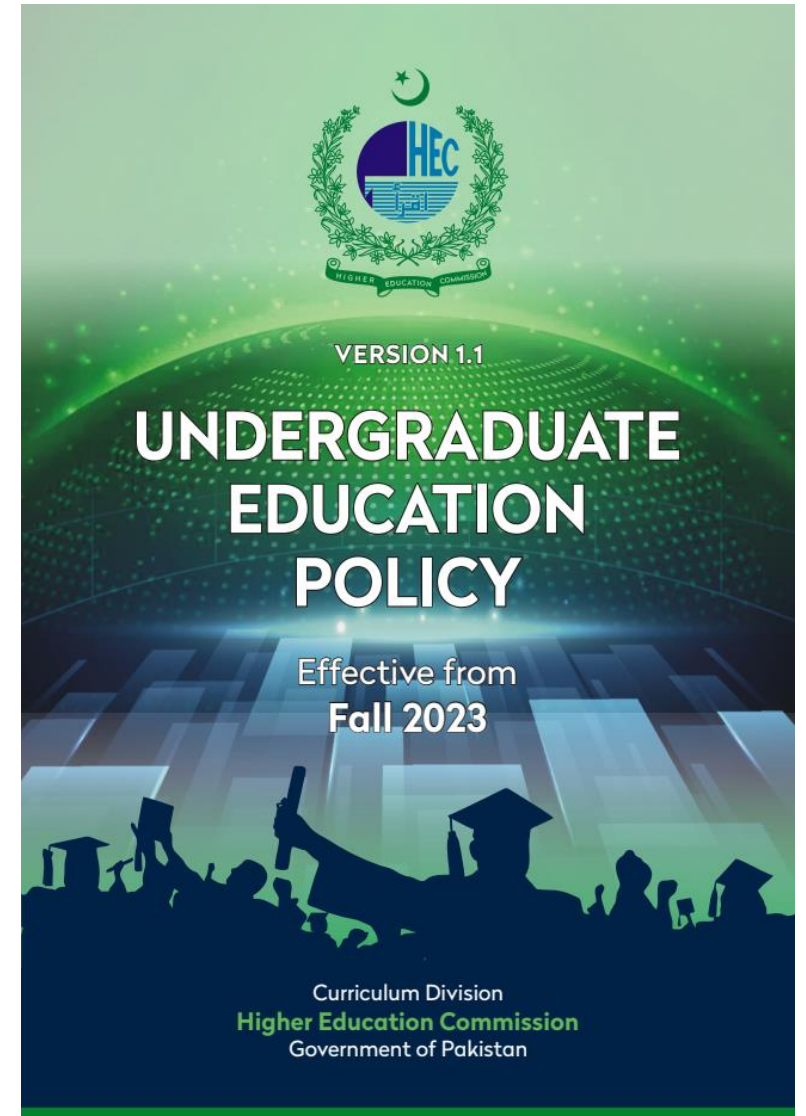
This module is meticulously structured to enhance both professional and personal development, ensuring that medical graduates are not only adept in clinical skills but also well- rounded individuals equipped with a diverse skill set.

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

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 communication technologies (ICT)	2 credit hours (HEC)25 Hours (PMDC)	25 Hours
Family medicine	-----	30 Hours
Artificial intelligence	-----	25 Hours
Behavioral Sciences	100 Hours (PMDC)	150 Hours

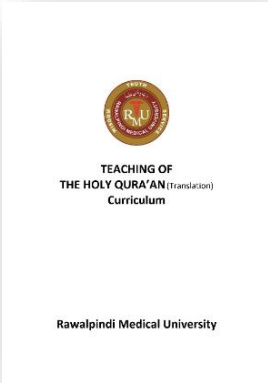
- 1 credit hour = 16 teaching hours
 - The minimum requirement for the general education component is 30 credits in all the undergraduate/equivalent degree programs including associate degree.
- References: undergraduate-policy-2023-1pdf/261474627

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.



The Holy Quran Curriculum



Lectures Distribution as per Criteria

القرآن بمعہ ترجمہ برائے جماعت ایم پی بی ایس سال اول تا پنجم										
سال	ایمانیات		عبادات		اخلاقیات		معاملات		معاشرت	
	لیکچر	فیصد	لیکچر	فیصد	لیکچر	فیصد	لیکچر	فیصد	لیکچر	فیصد
سال اول	6	35	5	29	2	12	2	12	2	12
سال دوئم	6	35	4	24	3	18	2	12	2	12
سال سوئم	4	24	4	24	4	24	3	18	2	12
سال چہارم	3	18	2	12	4	24	4	24	4	24
سال پنجم	2	12	2	12	5	29	4	24	4	24
کل لیکچرز	21		17		18		15		14	85

سال دوئم

ایمانیات

- لیکچر نمبر
- 1 دنیا کی زندگی کی مثال اور آخرت میں ایمان والوں کو اللہ تعالیٰ کا دیدار اور مشرکین کا حال
- 2 توحید کی مثالیں
- 3 رسول اللہ ﷺ کی رسالت پر مشرکین کے اعتراضات اور ان کے جوابات
- 4 تمام انبیاء علیہم السلام کے بھیجنے کا مقصد
- 5 شرک کی مثال روز قیامت کے بعد احوال
- 6 اللہ تعالیٰ کی وحدانیت اور رسول ﷺ کی رسالت کے دلائل

عبادات

- 7 حج
- 8 امر بالمعروف ونہی عن المنکر، دعوت الی اللہ
- 9 ہجرت و نصرت، استقامت
- 10 اعلان کلمۃ اللہ (اللہ کے کلمے کو سر بلند کرنا) جہاد

اخلاقیات

- 11 سچائی و راست بازی
- 12 جھوٹ اور غلط بیانی
- 13 سخاوت و بخل

معاملات

- 14 آداب رسول ﷺ، افواہوں سے پرہیز
- 15 تمسخر، ایذا رسانی، بدگوئی، غیبت سے اجتناب

معاشرت

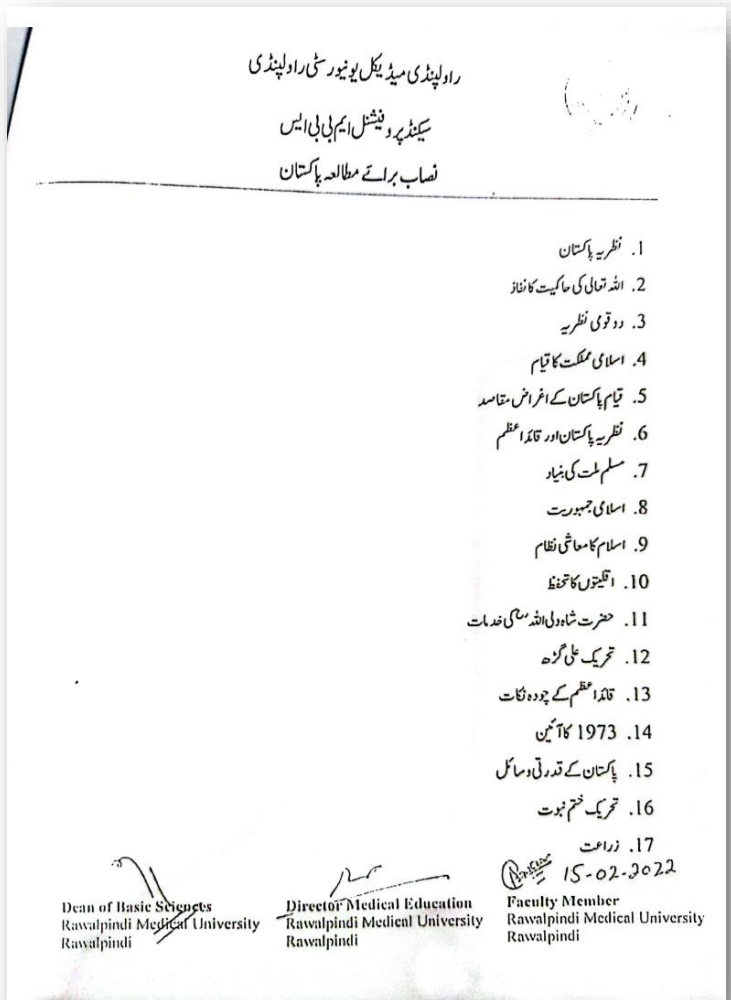
- 16 کھانے پینے کے احکام
- 17 شراب اور جوا کی حرمت

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 GIT 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

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

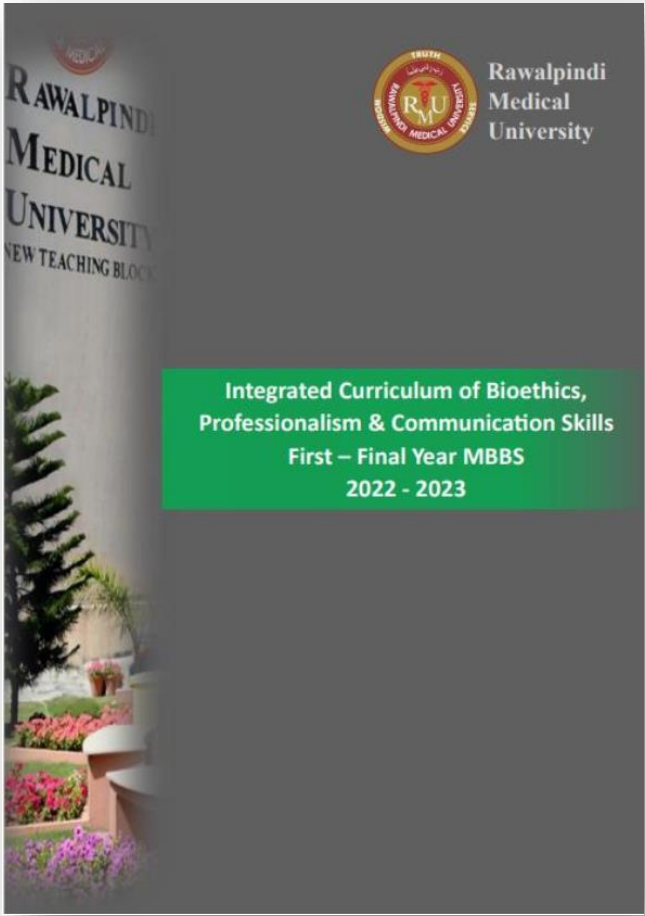
The Bioethics Curriculum for undergraduate medical students integrates ethics and professionalism as a core, longitudinal theme across all five years of medical education. It aligns with global standards set by organizations like WFME and ACGME, as well as national guidelines from the Pakistan Medical 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.

Framework of Bioethics Curricula at Rawalpindi Medical University



Biomedical Ethics Curriculum



Module - II – Basic Bioethics Module

2nd year MBBS

Theoretical Component (Integrated Bioethics Methods: IBM-II)

This module will cover Oath/Declaration by a Registered Medical or Dental Practitioner at time of graduation and importance of Pakistan Medical & Dental Council Code of Ethics of Practice for Medical and Dental Practitioners. This module make students cognizant with importance of Pakistan Medical and Dental Council of Pakistan to maintain the register of Medical and Dental practitioners, regulate the standards of medical practice, protect the interests of the patients, supervise medical education, and give guidelines on ethical issues. Another important theme of this module is explanation of four basic ethical principles: autonomy, beneficence, non-maleficence & justice and explaining the process of ensuring patient autonomy, beneficence, non-maleficence, respect & justice while informing/ deciding on a treatment modality.

Practical Component (Student Practical Component: SPC -II)

This module will cover historical aspect of ethical dilemma and the potential risk inflicted to participants as a result of violation in ethical practices from involvement in scientific research in past. Students will get familiar with the concept that how ethical dilemma in past led to evolution of several contemporary documents by video demonstration and case based discussions on real life scenarios violation in ethical principles namely autonomy, beneficence, non-maleficence and justice. Students will get familiar with the concept that



how ethical dilemma in past led to evolution of several contemporary documents which have been created to minimize such exploitation and safe guard the rights of participants.

Leadership & Professionalism

Professionalism in medicine is the GIT 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.

2nd Year MBBS:

Focus: Practical Application and Team Dynamics

Interactive Lectures:

Personal Values for Leadership (1 Hour)

respect, ethics, interpersonal connection, desire for change, commitment, and emotional intelligence.

Team Values for Leadership (1 Hour)

Cooperation & sharing, cohesiveness & Collaboration, trust and conflict management.

Role Play:

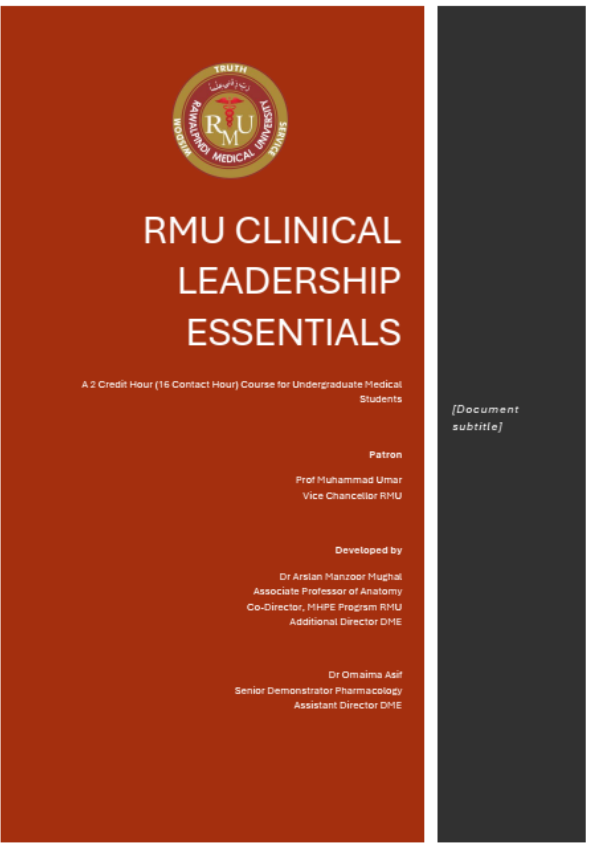
Conflict Resolution (1 Hour)

Self-Assessment:

Emotional Management (1 Hour)

Reflective Journaling:

Continue reflective journaling, emphasizing reflections on values of leadership



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.

Module	Topic	Learning Outcome	Learning Domains	Mode of Teaching
GIT Module 1	Learning	The student should be able to <ul style="list-style-type: none"> To define Learning. To describe the types of Learning i.e Classical and Operant conditioning. To relate the concept of different types of learning in everyday practice, disease causation and psychotherapy 	C1 C2 C3	LGIS
	Memory	The student should be able to <ul style="list-style-type: none"> To define the types of memory. To explain the areas in brain responsible for memory storage and Retrieval. To describe ways to improve memory 	C2 C2 C3	LGIS
Renal Module 2	Perception	The student should be able to <ul style="list-style-type: none"> To be able to define perception. To be able to classify types of perception To be able to identify perceptual abnormalities and relate them with illness 	C2/ C3 C2/C3	LGIS
	Thinking and Motivation	The student should be able to <ul style="list-style-type: none"> Define thinking and problem solving Elaborate problem-solving method Identify the barriers of creative thinking. Define motivation and self-actualizer Elaborate the Maslow's Hierarchy of Needs 	C1 C2/ C3 C3	LGIS
Reproduction Module 3	Emotion	The student should be able to <ul style="list-style-type: none"> To define emotions. To explain the neuroanatomy and neurochemistry of emotion To handle situations with heightened emotions encountered in daily life and clinical practice 	C3 C3	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		32 hours
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

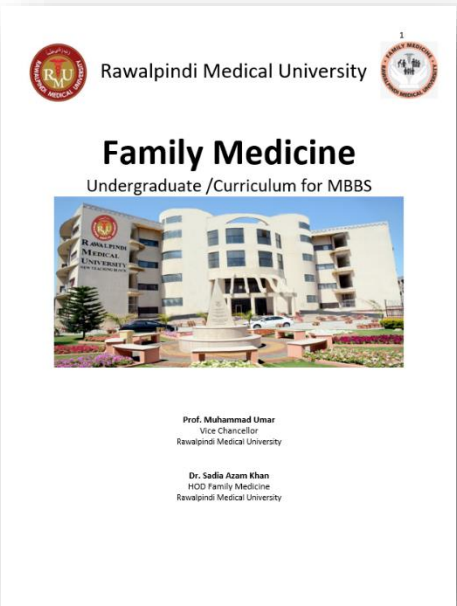
	Intelligence	The student should be able to <ul style="list-style-type: none"> To define types of intelligence and thinking. To differentiate between EQ and IQ. To apply the components of EQ and IQ in everyday dealing with patients and peers 	C2 C3	LGIS
CNS Module 4	Sleep and Arousal	The student should be able to <ul style="list-style-type: none"> Understand the mechanism of sleep and arousal Elaborate the stages of sleep Understand the sleep disorders 	C1 C2 C3	LGIS
	Defense Mechanism	The student should be able to <ul style="list-style-type: none"> Understand the healthy and unhealthy defense mechanisms Elaborate various defense mechanisms 	C1 C3 C3	LGIS
Special Senses Module 5	Metacognition	The student should be able to <ul style="list-style-type: none"> Define metacognition Understand the neurobiological basis of metacognition 	C1 C3	SDL
Endocrinology Module 6	Language	The student should be able to <ul style="list-style-type: none"> Define language Understand the neurobiological basis of language Elaborate various parts of brain involved in language 	C1/C2	SDL

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

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:

Topic	Year of study	Hours	Teaching method	Assessment		
				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	2 nd	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 posting	Portfolio CBD	Rotation CBD	Rotation 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

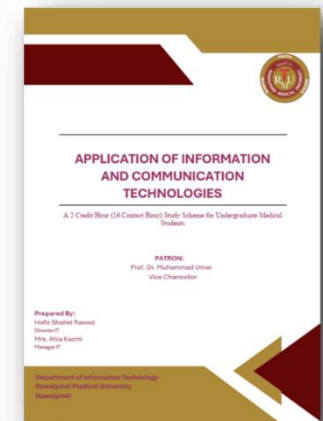
Specific Learning Objectives

Subject	Topic	Hours needed	S. No	Learning Objectives At the end of this module, the students of MBBS will be able to:
A) Population Centered Care				
Community medicine	Social determinants of health	1	1	Describe the social determinants of health
	Environmental and climate factors in disease causation		2	Explain the role of environmental and climate factors in disease 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 education	Patient safety, clinical governance and quality improvement	1	5	Explain the concept of patient safety, clinical governance and quality improvement in primary healthcare
Family Medicine	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) Principles & practice of Family Medicine				
FM/ CM/ Medicine	History and current structure of general practice	1	16	Describe the historical perspectives of general practice
			17	Explain the structure of general practice nationally and internationally
	Models of healthcare and universal health coverage	1	18	describe the models of healthcare Learn the concept of universal health coverage
	Ethics in clinical practice	2	19	Define ethics , understand the scope ethical practice to realize the importance of applying ethics in clinical practice
			20	Describe the role of a GP in monitoring and coordinating patients' treatment plans, educate them 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: Working with MS Word, Using Internet Services, Social Networks

Interactive Lectures:

- Working with MS Word- Word Document Operations and Formatting5 | P a g e
- Working with MS Word- Adding Multimedia and Objects
- Real-time communication on the Internet
- Wired and Wireless Networks
- Basics of Social Networking (Online)
- Use of Digital Library by Undergraduates (Online)

Workshop:

Workshop on effective use of HEC Digital Library by Medical students.

Collaborative Learning:

Effective use of Social Networking Platforms for Medical Appointments. Identify discrepancies if any.

Individual Project:

- Create a resume in Microsoft Word following specific formatting guidelines, such as page size and margins, and including their name, contact details, objective, qualifications listed in reverse chronological order, and any other details in a formatted table. The resume should have the student's own academic and professional details and can be extended over multiple pages to include all information.
- Develop a 3-pager Word Document of any medical research done that includes graphical objects (images, shapes, mathematical symbols and tables, hyperlinks)

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 Second-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 GIT 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

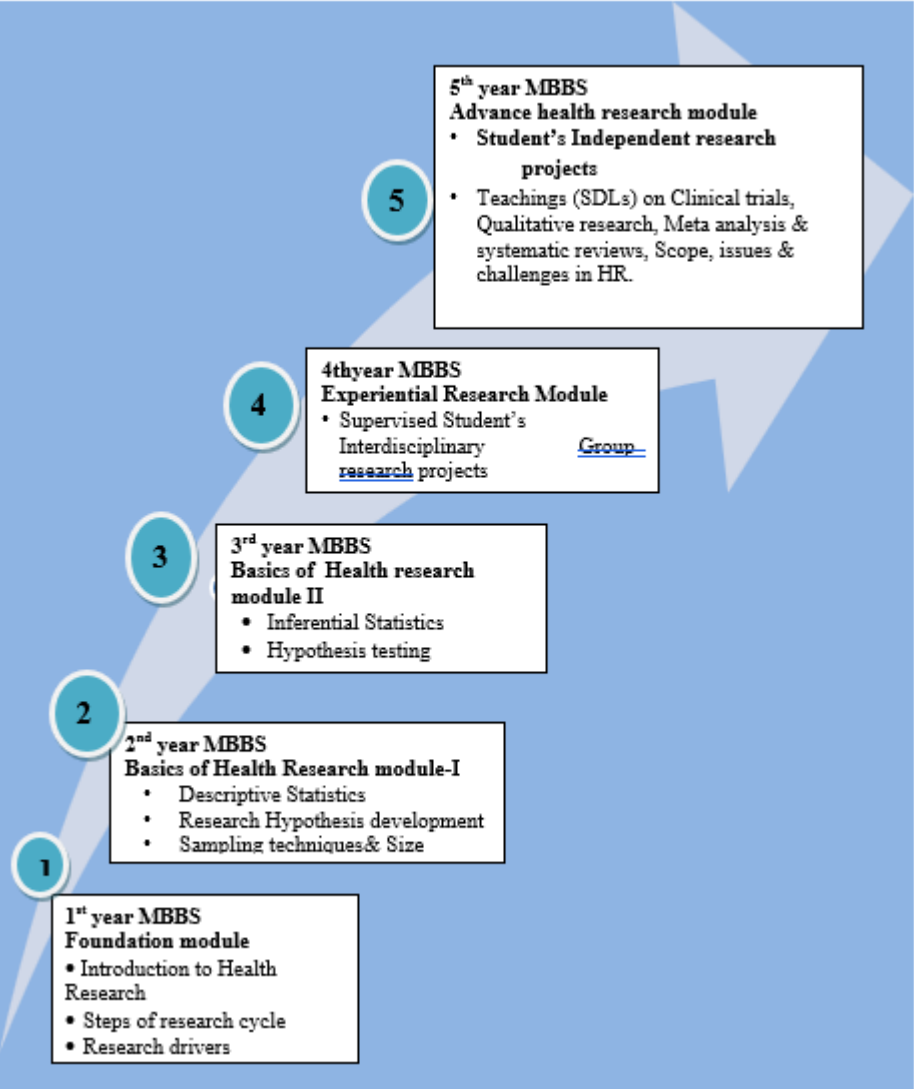
Objectives

- 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 .
- 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 glance



Year of MBBS course	Total Hrs allocated to Com-Med by PMDC	Hrs allocated to IUGRC ^a Visible within overall MBBS timetable	Actual Hrs invested in IUGRC teachings & class Pattern	Course title	Mode of Teaching
I	25	4hrs	4 x 4 = 16hrs (1/4th, 4 Parallel LGIS ^b)	Health Research GIT Module	Formal ^d
II	25	6hrs	6 x 4 = 24hrs (1/4th, 4 Parallel LGIS)	Basics of Health Research Module-I	
III	50	8hr	8 x 4 = 32hrs (1/4th, 4 Parallel LGIS)	Basics of Health Research Module-II	
IV Formal Year of CM	150	20hrs 10 contact sessions ^c Each comprising 2hrs	^c 14 x2 x 10 =280hrs (small group based teachings) 14 (7 sessions each day for 2days) parallel contact sessions, each extending over 2hrs (one contact)	Experiential Health Research Module	
V	4 (added)	4 hrs	4 x 4 = 16hrs (1/4th, 4 Parallel LGIS)	Advance Health Research Module	
	250hrs total (254)	42hrs (15% of total hrs allocated to CM by PMDC are devoted to research)	368hrs visible time effort (part of student's regular time-table) in addition to informal contact sessions & Web based		

Component-II for 2nd year MBBS

Premise:

- Second year research teachings are based on principal of incorporating ACTIVE LEARNING. Research teaching begins with revising the instructional plan for the selected course. It includes;
- Reviewing the expected learning outcomes: This module of IUGRC aims to equip the 2nd year students with necessary knowledge and skills for applying quantitative research methods for generating new knowledge and evidence. After the students are educated in meanings & need of Biostatistics are expected to develop a clear understanding of data & variable, types, methods of summarization & presentation of data, principles of descriptive analysis including cross-tabulations, use of relevant computer programs, descriptive study designs and its applications to address a specific research question.
- Identifying potential pedagogical methods to achieve the learning outcomes. Course outlines for each 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.
- Selecting the method (learning activity) which is feasible and appropriate for the students at this level, keeping in consideration their learning environment (context). 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 etc. Post session assignments / exercises are assigned for comprehending biostatistics.
- White-board & markers, Multimedia projections and other internet based teaching tools & computer based soft-wares are used as teaching aids.

Schedule of Assessment :

- 1 MCQs covering each session teachings is part of relevant block examinations and 06 MCQs in total. Results will contribute towards IA under total 06 marks in 1st Prof. MBBS evaluation.
- Subject will share 04 MCQs in 2nd Prof. MBBS Exam. Overall assessment is under 10 Mark in total.

2 nd Year MBBS		Contact Session duration 60-90min		
Course title: Descriptive Statistic				
Session & Title	Session Course outlines	Learning outcomes	Teaching strategy	Assessment tool
(I) Information & precision in scientific work (Data & variable)	<ul style="list-style-type: none">- Definition, uses and need of statistics in research & healthcare profession.- Concept of data & variable and sources of data- Concept of information & precisionTypes of data with explanation with examples. (nominal, ordinal, interval & ratio scale data)- Classification of variables (qualitative & quantitative, Discrete & Continuous)- Raw and Processed Data- Sources of health data- Descriptive & inferential statistics- Simple data entry and construction of a variable in computer software (SPSS etc)	<p>By the end of the session students should be able to:</p> <ul style="list-style-type: none">- Define & enlist uses of statistics in research- Appreciate value of information & precision in scientific decision making- Differentiate b/w data & variable- Enlist data types with examples in medical background- Classify variable with examples- Differentiate descriptive statistics form inferential statistics- Enlist sources of data- Identify raw & processed data with example- Demonstrate constructing variable and data entry in computer (SPSS, ..)	<ul style="list-style-type: none">- SGID (small group interactive discussions)- Prior & post teachings assignment-based model.- Session are conducted by Senior faculty- Attendance is monitored objectively	1 MCQs of level C1 to C3
(II) Data Organization & Data Presentation methods	<p>Include</p> <ul style="list-style-type: none">- Frequencies (qualitative data)- Frequency distribution (quantitative data)- Tabulations- Data presentation methods inc: Bar & pie diagram, histograms & line diagrams, frequency polygons- Frequency distribution tables & curves- Shapes of frequency distributions (modality &skewness)- Use of computer soft ware (SPSS etc) for data entry, tabulation & graphing	<p>By the end of the session students should be able to;</p> <ul style="list-style-type: none">- Construct simple & complex tables for quali-variable- Construct frequency distribution table for quanti-var showing class limits, class freq-, relative freq- & cumulative frequencies.- Interpret freq- tables- Indicate diff graphs & diagrams used for diff types of data- Construct bar & pie diagram, histogram and line graphs- Interpret graphs and forms of skewness- Demonstrate on computer above data presentations skills	<ul style="list-style-type: none">- SGID (small group interactive discussions)- Prior & post teachings assignment based model.- Session are conducted by Senior faculty- Attendance are monitored objectively	1 MCQs of level C1 to C3

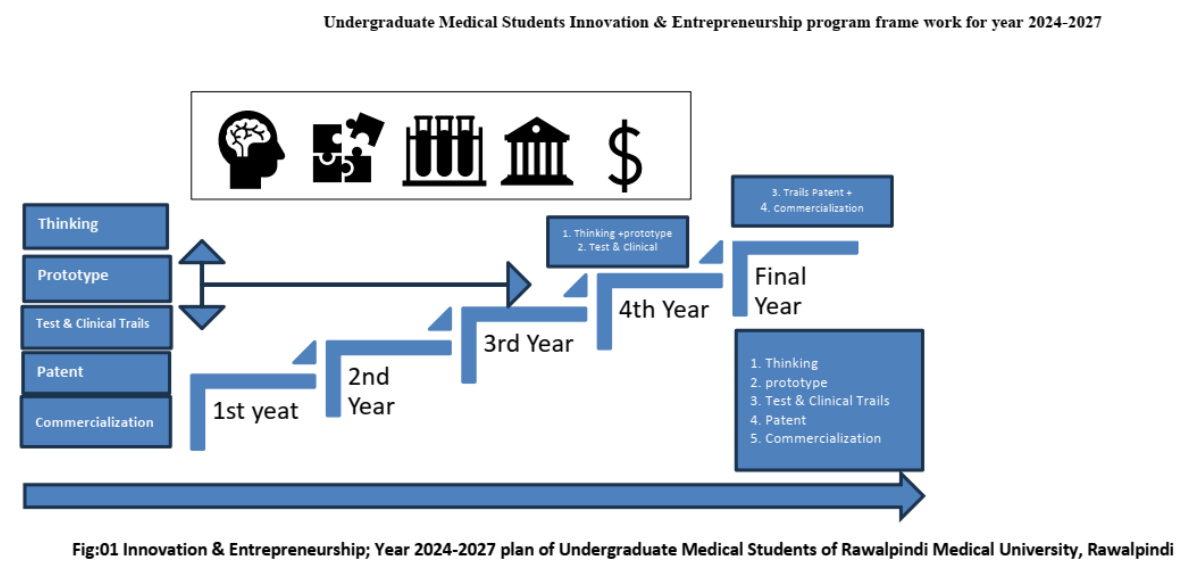
<p style="text-align: center;">(III)</p> <p style="text-align: center;">Data summarization : Measures of Central Tendency & Measures of Variations</p>	<p>Interactive discussion covering following areas of descriptive statistics;</p> <ul style="list-style-type: none"> - Measures of Central Tendency MCT (Mean, Median & mode), uses and advantages & disadvantages of each with illustrations - Measures of variations (range, mean deviation, standard deviation & Inter-quartile range) with illustrations form medical background - Degree of freedom (DF) - Coefficient of variations - Data summary measures for a population & sample - Application of data summary measures for on health data. (descriptive analysis of data - Uses of computer software (SPSS) on data summarization techniques 	<p>By the end of session students should be able to:</p> <ul style="list-style-type: none"> - Compute and explain uses of different measures of central tendency (mean, mode, median) form a given data file - Compute and explain with examples uses of measures of variations (range, IQ-range, variance & Standard deviation) form a given data file - Explain concept with example DF - Compute Coefficient of variation for give data file - Compare two data sets by computing & comparing their coefficient of variations - Explain diff b/w population &sample mean, SD. - Summarizes a given health related data set in term of measures of central tendency and variation (descriptive analysis) - Demonstrate above on computer 	<ul style="list-style-type: none"> - SGID (small group interactive discussions) - Prior & post teachings assignment based model. - Session are conducted by Senior faculty - Attendance is monitored objectively 	<p style="text-align: center;">1 MCQs of level C1 to C3</p>
<p style="text-align: center;">(IV)</p> <p style="text-align: center;">Probability , Probability distribution and Normal Distribution</p>	<p>Interactive discussion covering following areas of descriptive statistics;</p> <ul style="list-style-type: none"> - concept of probability in medical statistics calculation of probability (addition & multiplication rules) - Normal distribution and standard normal distributions - Importance of Normal Distribution curve and standard Normal Curve in medical statistics - Relative deviate 	<p>By the end of session , students should be able to:</p> <ul style="list-style-type: none"> - State meanings of probability and its application in health data management & research - State & apply basic principles of probability in health situations - Explain importance of Normal distribution in health research decision making - Identify properties of normal dist. curves. - Explain & compute normal deviate 	<ul style="list-style-type: none"> - SGID (small group interactive discussions) - Prior & post teachings assignment-WBO - Session are conducted by Senior faculty - Attendance is monitored objectively 	<p style="text-align: center;">1 MCQs of level C1 to C3</p>
<p style="text-align: center;">(V)</p> <p style="text-align: center;">Descriptive analysis of data: Frequencies, 2x2 table & Cross-tabulations</p>	<p>Interactive discussion covering following areas of descriptive statistics;</p> <ul style="list-style-type: none"> - Descriptive analysis of data. <ul style="list-style-type: none"> - Frequencies & distributions - Constructions of 2x2 	<p>By the end of session , students should be able to:</p> <ul style="list-style-type: none"> - Perform descriptive data analysis techniques on given data set (descriptive study data) in term of frequencies, percentages, proportions, ratios, rates, variability measures 	<ul style="list-style-type: none"> - SGID (small group interactive discussions) - Prior & post teachings assignments (WBO). - Session are conducted by Senior 	<p style="text-align: center;">1 MCQs of level C1 to C3</p>

	(contingent)table <ul style="list-style-type: none">- Descriptive Cross-tabulation- Analytical cross tabulation- Role of cross tabulation / 2x2 table in hypothesis generation & testing	<ul style="list-style-type: none">- Perform descriptive and analytical cross tabulation for two binomial variables in the give distribution.- Interpret the results of cross-tabulations- Generate hypothesis based on analytical cross tabulations	faculty <ul style="list-style-type: none">- Attendance is monitored objectively	
(VI) Sampling in Health research - I	include; <ul style="list-style-type: none">- Concept of sampling in health research- Need of sampling in health research- Sampling methods and limitations and indications for each method.- Effectiveness of a random sample in health research- Fundamentals of sample size calculation	By the end of session , students should be able to: <ul style="list-style-type: none">- Explain concept of sampling in HR- Distinguish with example each sampling method- State merits and demerits of each method- Explain factors which determine sampling technique and size according to a research study need.- Explain importance of random sample in research.	<ul style="list-style-type: none">- SGID (small group interactive discussions)- Prior & post teachings assignment based model.- Session are conducted by Senior faculty- Attendance is monitored objectively	1 MCQs of level C1 to C3
Session-VII				
(VII) Sampling in Health Research - II	Interactive discussion on; <ul style="list-style-type: none">- Central limit theorem- Errors in sampling- Non sampling error / systematic errors- Sampling error and standard error- Generalize ability of results of research & sampling method- Confidence interval- Sample size calculation formulae- Web based sample size calculators	By the end of session , students should be able to: <ul style="list-style-type: none">- Explain sampling and non-sampling errors- Explain central limit theorem- Explain ways to address non-sampling errors- Apply standard error in calculation of 95% confidence interval for point estimate in a given data set.- Interpret research results generalize ability in term of confidence interval- Calculate the sample size a given research study by manual fformula- Calculate sample size from internet based WHO calculator	<ul style="list-style-type: none">- SGID (small group interactive discussions)- Prior & post teachings assignment based model.- Session are conducted by Senior faculty- Attendance is monitored objectively	1 MCQs of level C1 to C3

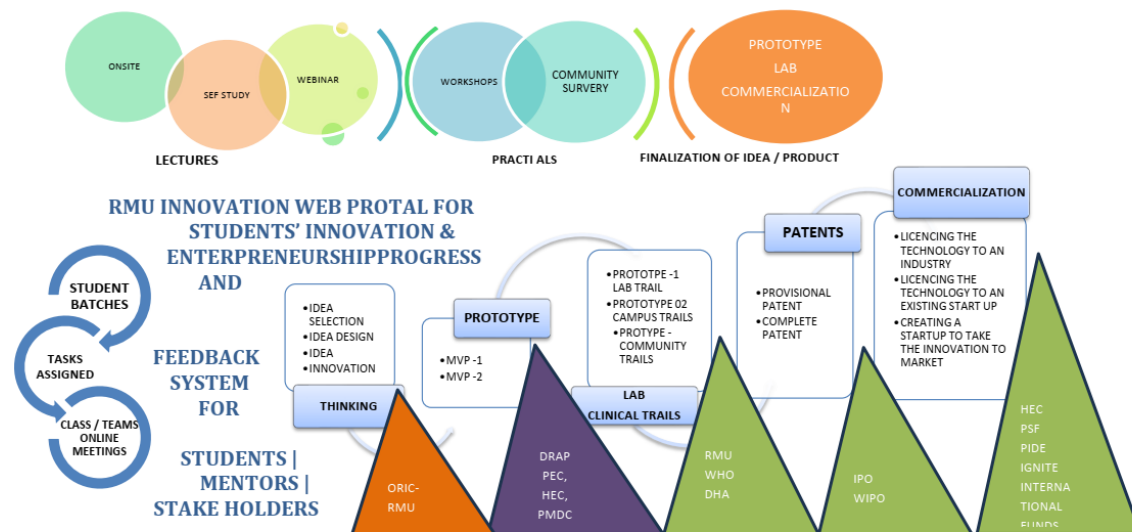
Innovation & Entrepreneurship

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.



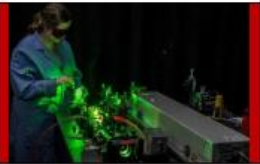
Such initiatives often lead to the creation of medical devices, digital health platforms, and therapeutic solutions that can significantly improve patient outcomes and make healthcare more accessible and efficient. Through incubators, accelerators, and partnerships with the industry, medical universities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



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



Year 01 to year 5th Sequence of academic Activities

		1 st year	2 nd Year	3 rd year	4 th Year	Final Year	
Physical	Feb	Innovation / Lecture	Thinking	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						
Webinar	May		Idea presentations				
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	

Second Year:

1. **Ideas:**

- Engaging in research projects to explore innovative solutions to medical challenges.
- Collaborating with peers to generate ideas for improving patient care or healthcare delivery systems.

2. **Prototype:**

- Developing prototypes for medical devices or apps as part of coursework or extracurricular projects.
- Refining design concepts based on feedback and iterative testing.

3. **Test & Clinical Trials:**

- Learning about clinical trial design and methodology.
- Participating in observational studies or small-scale clinical trials under supervision.

4. **Patent:**

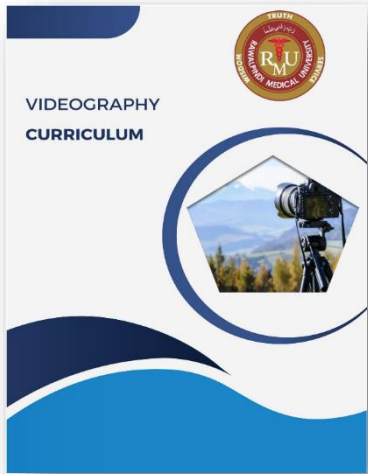
- Identifying patentable ideas emerging from research projects or prototypes.
- Working with faculty mentors to assess the novelty and feasibility of patenting ideas.

5. **Commercialization:**

- Exploring potential market demand for innovative medical products or services.
- Learning about business models and strategies for commercializing healthcare innovations.

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 GITs 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.



Second Year MBBS Advanced Camera Techniques and Lighting (6 hours)

Sr No.	Topic	Learning Objectives	Teaching Strategy	Assessment Tool
1.	Manual Camera Settings	Master manual exposure settings, including aperture, shutter speed, and ISO.	LGIS	MCQs
		Understand how to achieve desired depth of field and dynamic range.		
2.	Advanced Camera Operations	Practice advanced camera techniques such as focusing techniques and motion capture.	LGIS	MCQs
		Experiment with different camera movements to enhance visual storytelling.		
3.	Advanced Lighting Techniques	Explore advanced lighting setups for various indoor and outdoor shooting scenarios.	LGIS	MCQs
		Understand how to use lighting to create mood and atmosphere in videos.		
4.	Lighting for Narrative Impact	Analyze case studies of how lighting enhances narrative in films and videos.	LGIS	MCQs
		Apply advanced lighting techniques to create specific visual effects and storytelling elements.		
5.	Editing and Color Grading Basics	Introduce video editing software and its basic tools and interface.	LGIS	MCQs
		Understand the fundamentals of color correction and grading to enhance video quality.		
6.	Lighting and Camera Techniques	Design and execute a video project emphasizing advanced camera techniques and lighting setups.	LGIS	MCQs
		Demonstrate proficiency in using advanced camera settings and lighting techniques effectively.		

➤ Section-X Early Clinical Exposure (ECE)

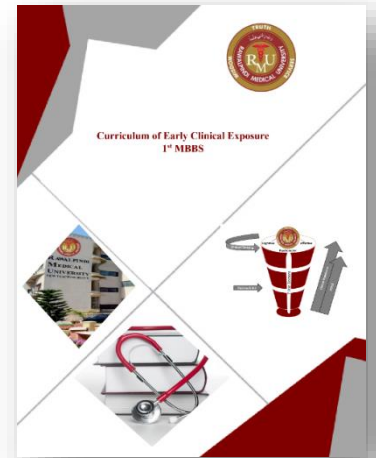


Early Clinical Exposure (ECE)

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.: Early clinical experiences often involve working in multidisciplinary teams, which fosters a sense of collaboration and understanding of different roles within healthcare.

In summary, early clinical exposure in medical education is pivotal for the holistic development of medical students, providing them with a strong GIT 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 GIT 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.
6. 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.



Early Clinical Exposure
Gastrointestinal Module
Rotation to Department of Medicine

Early Clinical Exposure Second Year MBBS		
Session	Learning Objectives	Teaching Strategy
I See patients of Epigastric Pain	At the end of the session students will be able to <ul style="list-style-type: none"> • Enlist causes of epigastric pain, • Gain insight into the various causes and presentations of this symptom. 	<ul style="list-style-type: none"> • Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit
II Examination of Abdomen	By the end of the session, students will be able to <ul style="list-style-type: none"> • Demonstrate the four fundamental techniques of abdominal examination: inspection, palpation, percussion, and auscultation, on a simulated patient. • identify normal abdominal anatomy and recognizing the significance of common variations. 	Bedside Teaching •Duration 1 hour •Conducted by senior faculty member of unit
III Observe cases of Jaundice and Cirrhosis	At the end of session, students will be able to <ul style="list-style-type: none"> • Understand the Pathophysiological basis of Jaundice and Cirrhosis: • Identify the key clinical manifestations of jaundice and cirrhosis in observed patients, including but not limited to yellowing of the skin and eyes and ascites 	<ul style="list-style-type: none"> • Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of unit

Rotation to Department of Surgery

Early Clinical Exposure Second Year MBBS		
Session	Learning Objectives	Teaching Strategy
<p style="text-align: center;">I Acute Abdomen</p>	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> define what constitutes an acute abdomen and list the common causes. identify the key clinical features associated with an acute abdomen, such as severe abdominal pain, tenderness, guarding, and rebound tenderness, through observation 	<p>Bedside Teaching</p> <ul style="list-style-type: none"> Duration 1 hour Conducted by senior faculty member of unit
<p style="text-align: center;">II See cases of Intestinal Obstruction</p>	<p>By the end of the session, students will be able to</p> <ul style="list-style-type: none"> Explain the pathophysiology of intestinal obstruction. differentiate between mechanical obstruction (such as due to adhesions, hernias, or tumors) and functional obstruction. Identify the key clinical features of intestinal obstruction, including abdominal pain, vomiting, distension, constipation, and recognize potential complications such as strangulation and perforation. 	<p>Bedside Teaching</p> <p>Duration 1 hour</p> <p>Conducted by senior faculty member of unit</p>
<p style="text-align: center;">III Observe cases Peritonitis</p>	<p>At the end of session, students will be able to</p> <ul style="list-style-type: none"> Explain the pathophysiology of peritonitis Identify common causes of peritonitis, such as perforation of the gastrointestinal tract, 	<p>Bedside Teaching</p> <p>Duration 1 hour</p> <p>Conducted by senior faculty member of unit</p>

	pancreatitis, and pelvic inflammatory disease	
<p>IV</p> <p>Hernias</p> <ul style="list-style-type: none"> • Incisional Hernia • Inguinal Hernia 	<p>At the end of session, students will be able to</p> <ul style="list-style-type: none"> • Describe the anatomy of the abdominal wall and inguinal region, • Explain the pathophysiological mechanisms that lead to the development of incisional and inguinal hernias. • Identify the signs and symptoms associated with incisional and inguinal hernias 	<p>Bedside Teaching</p> <p>Duration 1 hour</p> <p>Conducted by senior faculty member of unit</p>

Rotation to Department of Radiology

<p>Early Clinical Exposure</p> <p>Second Year MBBS</p>		
Session	Learning Objectives	Teaching Strategy
<p>I</p> <p>Ultrasound of Liver/ Ascites</p>	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> • Acknowledge ultrasound technology, a non-invasive diagnostic tool widely used in medical practice. • Understanding how ultrasound works and what a healthy liver looks like on ultrasound is fundamental for recognizing abnormalities. • Understand the normal ultrasound appearance of the liver, including its size, texture, and vascular structures. 	<p>Bedside Teaching</p> <ul style="list-style-type: none"> • Duration 1 hour • Conducted by senior faculty member of unit
<p>II</p> <p>Plain X-Ray Abdomen/ Fluid level/ Air under diaphragm</p>	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> • Describe the indications for ordering a plain X-ray of the abdomen. • List the basic steps in interpreting these images. 	<p>SGD</p> <p>Duration 1 hrs</p> <p>Conducted by senior</p>

	<ul style="list-style-type: none"> • Identify Fluid Levels and their clinical significance: • Recognize Air under the Diaphragm and its implications: 	faculty member of unit
III Barium swallow/ Meal/Enema	<p>By the end of the session, students will be able to</p> <ul style="list-style-type: none"> • Explain the basic principles behind barium swallow, barium meal, and barium enema procedures. • Understand the indications for each study, including which conditions they are best suited to diagnose • Identify normal and abnormal findings in Barium Studies: 	<p>SGD</p> <p>Duration 1 hrs</p> <p>Conducted by senior faculty member of unit</p>
IV CT Scan Abdomen	<p>At the end of session, students will be able to</p> <ul style="list-style-type: none"> • Understand the principles and indications of Abdominal CT Scanning: • Identify the normal anatomical structures of the abdomen on a CT scan • recognize common pathological findings, including tumors, cysts, 	<p>SGD</p> <p>Duration 1 hour</p> <p>Conducted by senior faculty member of unit</p>

Renal Module

Rotation to Nephrology Department

Early Clinical Exposure Second Year MBBS		
Session	Learning Objectives	Teaching Strategy
I Cases of Renal failure	At the end of the session students will be able to <ul style="list-style-type: none"> • Discuss the kidneys functions and how renal failure disrupts these functions, using patient observations to identify differences between acute and chronic renal failure. • Recognize key symptoms and signs of renal failure, such as changes in urine output, edema, and hypertension. • Get an introductory understanding of the diagnostic tests for renal function and basic management strategies for renal failure, emphasizing the importance of lifestyle adjustments and medical interventions. 	Bedside Teaching <ul style="list-style-type: none"> • Duration 1 hour • Conducted by senior faculty member of unit
II Dialysis	<ul style="list-style-type: none"> • Describe the fundamental principles of how dialysis works, including the difference between hemodialysis and peritoneal dialysis. • Explain how these methods help in removing waste products and excess fluids from the blood • Understand Indications and access for Dialysis • Recognize the impact of Dialysis on patient lifestyle and health 	SGD Duration 1 hrs Conducted by senior faculty member of unit
III Renal Transplant	By the end of the session, students will be able to <ul style="list-style-type: none"> • Understand the basics and 	

	<p>significance of Kidney Transplantation</p> <ul style="list-style-type: none"> • Familiarize with the Transplant Process • Appreciate the patient perspective and post-Transplant care. 	<p>SGD</p> <p>Duration 1 hrs</p> <p>Conducted by senior faculty member of unit</p>
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Rotation to Department of Radiology

Early Clinical Exposure Second Year MBBS		
Session	Learning Objectives	Teaching Strategy
<p>I</p> <p>Ultrasound of Kidney</p>	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> • Acknowledge ultrasound technology, a non-invasive diagnostic tool widely used in medical practice. • Understanding how ultrasound works and what a healthy Kidney looks like on ultrasound is fundamental for recognizing abnormalities • Understand the normal ultrasound appearance of the kidney, including its size, texture, and vascular structures. 	<p>Bedside Teaching</p> <ul style="list-style-type: none"> • Duration 1 hour • Conducted by senior faculty member of unit
<p>II</p> <p>Plain X-Ray KUB</p>	<ul style="list-style-type: none"> • Explain what KUB X-ray imaging is • List the key indications for its use, such as the detection of kidney stones, structural abnormalities in the urinary tract, and certain types of injuries. • Identify normal Anatomy and common pathological findings on KUB X-rays 	<p>SGD</p> <p>Duration 1 hrs</p> <p>Conducted by senior faculty member of unit</p>

	<ul style="list-style-type: none"> Distinguish between normal and abnormal findings, with an emphasis on recognizing common conditions that affect the urinary system. 	
III CT scan (To see Renal abnormalities)	<ul style="list-style-type: none"> List the key indications for using CT scans to investigate renal abnormalities, such as tumors, cysts, stones, and structural anomalies. Identify normal renal Anatomy and common abnormalities on CT scans. 	<ul style="list-style-type: none"> SGD Duration 1 hour Conducted by senior faculty member of unit

Rotation to Department of Pediatrics

Early Clinical Exposure Second Year MBBS		
Session	Learning Objectives	Teaching Strategy
I Nephrotic Syndrome	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> Describe the underlying pathophysiological mechanisms of Nephrotic Syndrome, including the significance of proteinuria, hypoalbuminemia, hyperlipidemia, and edema Understand how damage to the glomerular filtration barrier leads to the clinical features of this syndrome. Recognize the clinical manifestations of Nephrotic Syndrome, including the symptoms and signs such as severe edema, proteinuria, and complications related to the syndrome. Discuss management strategies for Nephrotic Syndrome, emphasizing the role of corticosteroids and other immunosuppressive agents, supportive care, and the management of complications such as infections and thromboembolism. 	<p>Bedside Teaching</p> <ul style="list-style-type: none"> Duration 2 hrs Conducted by senior faculty member of unit

Reproduction Module

Rotation to Department of Gynecology

Early Clinical Exposure Second Year MBBS Reproduction Module		
Session	Learning Objectives	Teaching Strategy
<p style="text-align: center;">I Ovarian Tumors</p>	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> • Define ovarian tumors and distinguish between benign and malignant types. • Describe the basic anatomy of the female reproductive system with emphasis on ovarian structure. • Identify common signs and symptoms associated with ovarian tumors. • Outline the roles of ultrasound and other imaging techniques in the diagnosis of ovarian tumors. • Understand basic blood tests, including tumor markers that may be elevated in ovarian cancer • Observe and, where appropriate, participate in the physical examination of a patient with an ovarian tumor under supervision. • Summarize the general treatment strategies for ovarian tumors, including surgical and non-surgical options. • Discuss the impact of early detection on treatment outcomes. • Recognize the emotional and psychological impacts of an ovarian tumor diagnosis on patients. • Develop skills in communicating 	<p style="text-align: center;">Bedside Teaching</p> <ul style="list-style-type: none"> • Duration 1 hour • Conducted by senior faculty member of unit

	effectively and empathetically with patients dealing with serious diagnoses.	
II Uterine Tumors	<ul style="list-style-type: none">• Define uterine tumors and distinguish between benign and malignant types.• Describe the basic anatomy of the female reproductive system with emphasis on uterine structure.• Identify common signs and symptoms associated with uterine tumors.• Outline the roles of ultrasound and other imaging techniques in the diagnosis of uterine tumors.• Understand basic blood tests, including tumor markers that may be elevated in ovarian cancer• Observe and, where appropriate, participate in the physical examination of a patient with a uterine tumor under supervision.• Summarize the general treatment strategies for uterine tumors, including surgical and non-surgical options.• Discuss the impact of early detection on treatment outcomes.• Recognize the emotional and psychological impacts of uterine tumor diagnosis on patients.• Develop skills in communicating effectively and empathetically with patients dealing with serious diagnoses.	Bedside teaching Duration 1 hour Conducted by senior faculty member of unit

III Polycystic Ovaries	<ul style="list-style-type: none">• Define polycystic ovarian syndrome and discuss its prevalence and etiology.• Describe the pathophysiology of PCOS, including the role of hormonal imbalances.• Identify Clinical Features and Diagnostic Criteria:• List the common clinical features of PCOS such as irregular menstruation, hirsutism, and obesity.• Explain the diagnostic criteria for PCOS, including the use of ultrasound and hormonal assays.• Observe and participate in the physical examination of a patient with PCOS, focusing on signs such as acne, hirsutism, and acanthosis nigricans.• Understand the use of ultrasound imaging in diagnosing ovarian morphology in PCOS.• Outline the lifestyle and medical treatment options available for managing PCOS, including dietary modifications, exercise, and pharmacotherapy.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hour• Conducted by senior faculty member of unit
	<ul style="list-style-type: none">• Identify various types of menstrual irregularities, including amenorrhea, oligomenorrhea, and menorrhagia.• Understand the underlying causes of menstrual irregularities, such as hormonal imbalances, structural abnormalities, and systemic diseases.• Learn how to take a comprehensive menstrual history, including onset, duration, frequency, and associated	

IV Menstrual Irregularities	<p>symptoms.</p> <ul style="list-style-type: none">• Practice performing a focused physical examination to evaluate for signs of hormonal abnormalities, such as hirsutism or thyroid enlargement.• Describe the diagnostic workup for menstrual irregularities, including laboratory tests such as hormone assays and imaging studies like pelvic ultrasound.• Discuss the role of additional investigations, such as endometrial biopsy, in specific cases where underlying pathology is suspected.• Explore non-pharmacological management options for menstrual irregularities, including lifestyle modifications and dietary changes.• Understand pharmacological interventions, such as hormonal contraceptives or medications targeting specific underlying conditions like polycystic ovarian syndrome (PCOS).• Emphasize the importance of patient-centered care in managing menstrual irregularities, including discussing treatment options, addressing concerns, and providing support.• Develop communication skills for discussing sensitive topics related to menstrual health in a compassionate and nonjudgmental manner.	
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Rotation to Department of Obstetrics

Early Clinical Exposure Second Year MBBS Reproduction Module		
Session	Learning Objectives	Teaching Strategy
I Important points in History of pregnant lady	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none">• Identify key components of the obstetric history, including gravidity (number of pregnancies), parity (number of live births), and abortion history (spontaneous or induced).• Recognize the significance of pre-existing medical conditions, past obstetric complications, and family history in pregnancy outcomes.• Discuss common symptoms and concerns during pregnancy, such as nausea and vomiting, urinary frequency, and fetal movements.• Describe the timeline and frequency of antenatal visits, including the content of routine antenatal care such as blood pressure monitoring, fetal growth assessment, and screening tests.• Discuss the significance of prenatal screening for conditions such as gestational diabetes and preeclampsia.• Understand the importance of prompt recognition and management of obstetric emergencies such as placental abruption, eclampsia, and fetal distress.• Develop effective communication skills for eliciting sensitive	<p>Bedside Teaching</p> <ul style="list-style-type: none">• Duration 1 hour• Conducted by senior faculty member of unit

	<p>information from pregnant patients, including history of substance use, domestic violence, and mental health concerns.</p> <ul style="list-style-type: none">• Emphasize the importance of building rapport, maintaining confidentiality, and providing nonjudgmental support during history-taking.	
<p>II Obstetrics Trimesters</p>	<ul style="list-style-type: none">• Define the three trimesters of pregnancy and their corresponding gestational periods Discuss the significance of trimester divisions in prenatal care and fetal development.• Identify key fetal development milestones during each trimester, including organogenesis, fetal viability, and fetal movements.• Understand the importance of timing in relation to specific developmental stages for prenatal screening and diagnostic tests.• Describe the physiological changes that occur in the maternal body during each trimester, including hormonal fluctuations, cardiovascular adaptations, and changes in uterine size.• Discuss common discomforts experienced by pregnant women during each trimester and their management strategies.• Understand the timing and rationale for various antenatal screening tests, such as ultrasound scans, maternal serum screening, and genetic testing.• Discuss routine interventions performed during specific trimesters, such as prenatal vitamins,	<p>Bedside teaching</p> <ul style="list-style-type: none">• Duration 1 hour• Conducted by senior faculty member of unit

	<p>immunizations, and glucose screening for gestational diabetes.</p> <ul style="list-style-type: none">• Identify common complications associated with each trimester, such as miscarriage and ectopic pregnancy in the Second trimester, gestational diabetes and preeclampsia in the second trimester, and preterm labor and placental abnormalities in the third trimester.	
<p>III Fetal heart sounds</p>	<ul style="list-style-type: none">• Identify the characteristic components of normal fetal heart sounds.• Understand the normal range of fetal heart rate variations based on gestational age and developmental stage.• Differentiate between fetal heart sounds and maternal heart sounds,• Demonstrate the ability to locate and isolate fetal heart sounds from maternal sounds using appropriate positioning and equipment.• Understand the importance of fetal heart monitoring in assessing fetal well-being• Practice proper auscultation techniques for detecting fetal heart sounds, including the use of a fetoscope or Doppler ultrasound device.• Demonstrate proficiency in locating and listening to fetal heart sounds at different abdominal quadrants and depths• Identify abnormal fetal heart rate patterns• Understand the significance of abnormal fetal heart patterns	<p>Bedside Teaching</p> <ul style="list-style-type: none">• Duration 1 hour• Conducted by senior faculty member of unit

Rotation to Department of Surgery

Early Clinical Exposure Second Year MBBS Reproduction Module		
Session	Learning Objectives	Teaching Strategy
I Testicular Tumors	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none">Describe the anatomy of the testes, including the structure of the seminiferous tubules and the role of Leydig cells in testosterone production.Identify common signs and symptoms of testicular tumors, such as a painless mass or swelling in the testicle, scrotal heaviness, and scrotal pain.Understand the significance of symptoms such as testicular pain or discomfort and their potential association with testicular pathology.Discuss the diagnostic approach to evaluating testicular tumors,Understand the role of testicular biopsy in confirming the diagnosis and determining tumor type.Outline the treatment options for testicular tumors.Discuss the importance of fertility preservation strategies and the potential impact of treatment on future fertility.Describe the prognostic factors influencing the outcomes of testicular tumors.Discuss the importance of long-term follow-up care.	<p>Bedside Teaching</p> <ul style="list-style-type: none">Duration 1 hourConducted by senior faculty member of unit

<p style="text-align: center;">II Hydrocele</p>	<ul style="list-style-type: none"> • Explain the pathophysiology of hydrocele formation, • Identify the clinical features of hydrocele, including scrotal swelling • Differentiate between communicating and non-communicating hydroceles • Discuss the diagnostic approach to evaluating hydrocele. • Understand the importance of distinguishing hydrocele from other causes of scrotal swelling, such as hernia or testicular tumor. • Outline the management options for hydrocele, including observation, needle aspiration (as a temporary measure), and surgical intervention (hydrocelectomy). • Discuss the indications for surgical intervention and the potential risks and benefits of each treatment option. • Describe potential complications of untreated hydrocele. • Discuss the prognosis for hydrocele following appropriate management. 	<p>Bed side teaching</p> <ul style="list-style-type: none"> • Duration 1 hour • Conducted by senior faculty member of unit
<p style="text-align: center;">III Undescended Testis</p>	<ul style="list-style-type: none"> • Describe the normal process of testicular descent during fetal development. • Explain the anatomical and physiological significance of testicular descent for normal testicular function and fertility. • Identify the clinical features of undescended testis • Understand the importance of distinguishing between retractile testis (physiological variant) and true undescended testis. 	<p>Bedside Teaching</p> <ul style="list-style-type: none"> • Duration 1 hour • Conducted by senior faculty member of unit

	<ul style="list-style-type: none">• Discuss the diagnostic approach to evaluating undescended testis• Understand the significance of identifying associated conditions, such as inguinal hernia.• Outline the management options for undescended testis.• Discuss the timing and indications for surgical intervention.• Describe the potential long-term implications of untreated undescended testis,• Discuss the importance of early detection and intervention in optimizing outcomes.	
IV Hypospadias/ Epispadias	<ul style="list-style-type: none">• Describe the normal anatomy of the male urethra and external genitalia.• Explain the embryological development of the male genitalia and the process of urethral formation:• Identify the clinical features of hypospadias and epispadias,• Understand associated features such as penile curvature, chordee (ventral penile tethering), and abnormalities of the foreskin.• Discuss the diagnostic approach to evaluating hypospadias/epispadias,• Understand the importance of assessing the severity and anatomical characteristics of the condition for treatment planning.• Outline the surgical options for correcting hypospadias/epispadias, including techniques• Describe the potential long-term outcomes and complications	<p>Bedside Teaching</p> <ul style="list-style-type: none">• Duration 1 hour• Conducted by senior faculty member of unit

	<p>associated with hypospadias/epispadias repair</p> <ul style="list-style-type: none">• Discuss the importance of long-term follow-up care.	
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Central Nervous System (CNS) Module
Rotation to Department of Medicine

Early Clinical Exposure Second Year MBBS CNS Module		
Session	Learning Objectives	Teaching Strategy
I Cases of stroke	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none">• Observe and describe the different types of stroke, including ischemic and hemorrhagic strokes, and explain the pathophysiological changes that occur in the brain as a result of these conditions.• Discuss the major risk factors for stroke, such as hypertension, atrial fibrillation, and diabetes, and recognize the early clinical signs and symptoms using the FAST (Face drooping, Arm weakness, Speech difficulties, Time to call emergency services) mnemonic.• Describe the initial steps in the management of stroke, including the importance of rapid assessment and intervention, the role of imaging in diagnosis, and the basic treatment strategies for ischemic versus hemorrhagic stroke	<ul style="list-style-type: none">• Bedside Teaching• Duration 1 hour• Conducted by senior faculty member of unit

<p style="text-align: center;">II Paraplegia</p>	<ul style="list-style-type: none"> • Outline the anatomical structures of the spinal cord and its functional relationship with the body, understanding how injuries or diseases affecting these areas can lead to paraplegia. • Discuss the various etiologies of paraplegia, including traumatic spinal cord injury, tumors, infectious diseases, and degenerative disorders, and explain the pathophysiological mechanisms that result in the loss of motor and sensory functions below the level of injury. • Describe the initial clinical assessment of a patient with suspected paraplegia, including the importance of a thorough neurological examination and the use of diagnostic imaging. They will also learn about the basic principles of acute management and the multidisciplinary approach needed for long-term rehabilitation. 	<ul style="list-style-type: none"> • Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
<p style="text-align: center;">III Vegetative state</p>	<ul style="list-style-type: none"> • Define a vegetative state and differentiate it from other conditions affecting consciousness, such as coma and minimally conscious states, based on clinical characteristics and brain activity. • Identify and explain the various causes that can lead to a vegetative state, including traumatic brain injury, severe brain hypoxia, and major neurological diseases, and discuss the underlying pathophysiological changes in the brain. • Describe assessment techniques used 	<ul style="list-style-type: none"> • Bedside teaching • Duration 1 hrs • Conducted by senior faculty member of unit

	to determine the extent of brain function, the typical medical care provided, and the ethical challenges involved in decisions about long-term care, including discussions on quality of life and end-of-life decisions.	
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Rotation to Department of Surgery/ Neurosurgery

Early Clinical Exposure Second Year MBBS CNS Module		
Session	Learning Objectives	Teaching Strategy
I Head injury	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> Classify head injuries into major categories such as concussions, contusions, skull fractures, and intracranial hematomas, and understand the mechanisms that typically cause these injuries. Recognize the immediate and delayed signs and symptoms of head injuries, including changes in consciousness, visible head trauma, cognitive impairments, and neurological deficits. Describe the basic pathophysiological changes that occur in the brain following different types of head injuries, such as the cascading effects of brain swelling, the impact of blood-brain barrier disruptions, and neuronal damage. Understand the initial steps in the assessment and management of a 	<ul style="list-style-type: none"> Bedside Teaching Duration 1 hour Conducted by senior faculty member of unit

	patient with a head injury, including maintaining airway, breathing, and circulation, the use of imaging modalities like CT scans to assess internal damage, and the criteria for when to escalate care to neurosurgical interventions.	
II Nerve injuries	<ul style="list-style-type: none">• Describe the basic anatomy of peripheral nerves and be able to classify nerve injuries according to severity, using the Sunderland and Seddon classification systems, which categorize injuries based on the extent of damage to nerve fibers and surrounding structures.• List the common causes of nerve injuries, including traumatic injuries (such as lacerations and avulsions), compression (from tumors or entrapment syndromes), and iatrogenic injuries (resulting from medical or surgical procedures).• Understand how to recognize the clinical manifestations of nerve injuries, such as loss of sensation, motor function, or autonomic dysfunction in the affected area, and how these symptoms correlate with the specific nerve damaged.• Discuss the initial steps in the management of nerve injuries, including the importance of a thorough neurological examination, the use of diagnostic tools like electromyography (EMG) and nerve conduction studies, and the principles guiding acute treatment and referral for possible surgical intervention.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hour• Conducted by senior faculty member of unit

	<ul style="list-style-type: none">• Define coma as a deep state of unconsciousness and distinguish it from other states such as vegetative state, minimally conscious state, and brain death by understanding the clinical and neurological criteria for each.• Explain the underlying pathophysiological mechanisms that can induce coma, including traumatic brain injuries, strokes, brain tumors, infections, and metabolic imbalances. They will also discuss the role of disruptions in the reticular activating system and cerebral cortex in the maintenance of consciousness.• Use the Glasgow Coma Scale (GCS) to assess the level of consciousness in a patient, interpreting scores to gauge the severity of the coma and potential outcomes. They will also identify other important clinical signs such as pupillary responses and motor reflexes that help differentiate the cause of coma.• Understand the initial diagnostic steps required when assessing a comatose patient, including neuroimaging, blood tests, and possibly lumbar puncture. They will also discuss the basic management principles aimed at preserving life and brain functions.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hrs• Conducted by senior faculty member of unit
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Rotation to Department of Radiology

Early Clinical Exposure Second Year MBBS CNS Module		
Session	Learning Objectives	Teaching Strategy
<p>I</p> <p>CT scan</p> <p>Brain</p> <ul style="list-style-type: none">• Normal• Stroke• Hemorrhage• Infarction	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none">• Recognize the normal anatomical structures visible on a CT scan of the brain, including the cerebral hemispheres, cerebellum, brainstem, ventricles, and major sulci and gyri. They will also understand the typical appearances of these structures in different slices (axial, coronal, and sagittal).• Identify the CT findings associated with ischemic and hemorrhagic strokes, including areas of hypodensity in ischemic stroke and hyper density in hemorrhagic stroke. They will understand the importance of timing in the imaging of stroke for optimal diagnosis and management.• Describe the key differences in appearance between brain hemorrhages and infarctions on CT scans. They will be able to describe the characteristics of hemorrhages (e.g., acute intracerebral hemorrhage appearing as a hyperdense area) and infarctions (e.g., loss of cortical definition and the appearance of infarcted areas as hypodense).• Interpret CT images in the context of clinical symptoms to make	<ul style="list-style-type: none">• Bedside Teaching• Duration 1 hour• Conducted by senior faculty member of unit

	<p>preliminary diagnoses and understand potential management strategies. This objective aims to integrate their radiographic findings with clinical reasoning to enhance their diagnostic acumen.</p>	
<p>II Hydrocephalus</p>	<ul style="list-style-type: none">• Define hydrocephalus as the abnormal accumulation of cerebrospinal fluid (CSF) within the ventricles of the brain.• Distinguish between the types of hydrocephalus, including communicating, non-communicating (obstructive), and ex-vacuo, and understand the mechanisms that lead to each type.• Identify the common causes of hydrocephalus, such as congenital malformations, infections, tumors, and traumatic injuries.• Discuss the pathophysiological changes that occur, focusing on the dynamics of CSF production, flow, and absorption.• Describe the clinical manifestations of hydrocephalus, which may vary by age and the rate of CSF accumulation.• Discuss the diagnostic tools used to identify hydrocephalus, primarily imaging techniques such as ultrasound in infants, CT scans, and MRIs.• Describe the treatment options available, including surgical interventions like ventriculoperitoneal shunt placement and endoscopic third ventriculostomy.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hour• Conducted by senior faculty member of unit

<p style="text-align: center;">III Brain atrophy</p>	<ul style="list-style-type: none">• Define brain atrophy as the loss of neurons and the connections between them, resulting in decreased brain volume. They will differentiate between focal atrophy, which affects specific areas of the brain, and generalized atrophy, which involves a reduction in the size of multiple brain regions.• Identify the various causes of brain atrophy, including neurodegenerative diseases (such as Alzheimer’s disease and Parkinson’s disease), traumatic brain injuries, stroke, and infectious diseases.• Describe the signs and symptoms of brain atrophy, such as cognitive decline, memory impairment, changes in motor skills, and alterations in behavior or personality, depending on the areas of the brain that are affected.• Discuss the role of imaging studies, such as MRI and CT scans, in diagnosing brain atrophy, and how these images can be used to assess the extent and pattern of atrophy.• Discuss the management approaches aimed at slowing the progression of symptoms and improving quality of life, including pharmacological treatments and supportive therapies.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hrs• Conducted by senior faculty member of unit
	<ul style="list-style-type: none">• Define brain edema• Distinguish between the two main types of brain edema: cytotoxic edema, which involves fluid	<ul style="list-style-type: none">• Bedside teaching

<p>IV</p> <p>Brain Edema</p>	<p>buildup within brain cells due to cellular injury, and vasogenic edema,.</p> <ul style="list-style-type: none">• Identify various causes of brain edema, including traumatic brain injury, ischemic stroke, infections, tumors, and toxic exposures.• Describe the clinical signs and symptoms of brain edema, which may include headache, nausea, vomiting, altered consciousness, and neurological deficits such as weakness or speech disturbances, depending on the severity and location of the edema.• Understand the diagnostic techniques used to identify brain edema, primarily imaging studies like CT and MRI scans• Discuss the management options available, including medical treatments to reduce swelling (such as corticosteroids and osmotic diuretics), surgical interventions to relieve pressure, and the importance of addressing the underlying cause of the edema.	<ul style="list-style-type: none">•Duration 1 hrs•Conducted by senior faculty member of unit
<p>V</p> <p>Skull/ spine Fractures</p>	<ul style="list-style-type: none">• Classify the types of skull fractures (such as linear, depressed, diastatic, and basilar) and spine fractures (including compression, burst, flexion-distraction, and fracture-dislocation).• Describe the Pathophysiology of Skull and Spine Fractures: Students will explore the pathophysiological implications of these fractures, including potential complications such as intracranial hemorrhage	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hrs• Conducted by

	<p>from skull fractures and spinal cord injury from spine fractures. They will examine how the location and severity of the fracture impact neurological outcomes.</p> <ul style="list-style-type: none">• Identify the clinical manifestations associated with skull and spine fractures. For skull fractures, symptoms may include visible deformities, cerebrospinal fluid leakage from nose or ears, and neurological deficits. For spine fractures, symptoms can include pain, paralysis, loss of sensation, and autonomic dysregulation.• Understand the diagnostic procedures used to assess skull and spine fractures, primarily focusing on imaging techniques like X-rays, CT scans, and MRI.• Discuss initial management strategies, including stabilization, neurologic assessment, and when to refer for surgical intervention.	<p>senior faculty member of unit</p>
<p>VI MRI Brain/ Spine</p>	<ul style="list-style-type: none">• Describe the fundamental principles of MRI technology, including how magnetic fields and radio waves are used to create detailed images of the brain and spinal structures.• Enlist the key indications for using MRI over other imaging modalities, such as its superior ability to differentiate between soft tissues and its usefulness in diagnosing conditions like tumors, inflammatory diseases, and vascular anomalies.• Recognize normal anatomical	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hrs <p>Conducted by senior faculty member of unit</p>

	<p>structures of the brain and spine on MRI scans.</p> <ul style="list-style-type: none"> • Identify common pathological findings, such as signs of herniated discs, spinal stenosis, brain tumors, multiple sclerosis plaques, and evidence of acute or chronic stroke. • Develop skills in interpreting MRI features that are specific to neurological conditions, • Describe the safety considerations associated with MRI, including the importance of screening for contraindications like implanted metallic devices. 	
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Special Senses and Endocrinology Module

Rotation to Department of Medicine

<p style="text-align: center;">Early Clinical Exposure Second Year MBBS Special senses and Endocrinology Module</p>		
Session	Learning Objectives	Teaching Strategy
I Thyroid disorders	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> • Describe its structure, and explain its physiological roles in the body, including the synthesis and regulation of thyroid hormones. • Recognize the signs and symptoms associated with common thyroid disorders such as hypothyroidism, hyperthyroidism, goiter, and thyroid nodules. • Describe basic diagnostic tests 	<ul style="list-style-type: none"> • Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

	<p>and procedures used to evaluate thyroid function, including TSH levels, T3 and T4 tests, ultrasound, and fine-needle aspiration biopsy.</p> <ul style="list-style-type: none"> • Discuss the general management strategies for thyroid disorders, focusing on pharmacological treatments such as synthetic thyroid hormones and anti-thyroid medications. 	
<p>II</p> <p>Hyperthyroidism</p>	<ul style="list-style-type: none"> • Discuss underlying mechanisms that cause hyperthyroidism, including the excess production of thyroid hormones. • Identify the clinical manifestations of hyperthyroidism, such as weight loss, tachycardia, heat intolerance, and tremors.. • Enlist specific diagnostic tests used in the evaluation of hyperthyroidism, including blood tests for thyroid-stimulating hormone (TSH) and thyroxine (T4), thyroid scan, and radioactive iodine uptake test. • Describe the initial management strategies for hyperthyroidism, focusing on antithyroid medications. 	<ul style="list-style-type: none"> • Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
<p>III</p>	<ul style="list-style-type: none"> • Describe the various causes of hypothyroidism, including autoimmune thyroiditis (such as Hashimoto's thyroiditis), iatrogenic factors, and iodine deficiency. 	<ul style="list-style-type: none"> • Bedside teaching • Duration 1 hour • Conducted by senior faculty

Hypothyroidism	<ul style="list-style-type: none"> • Recognize the signs and symptoms characteristic of hypothyroidism, including fatigue, cold intolerance, weight gain, constipation, and dry skin.. • Discuss the diagnostic criteria for hypothyroidism, including the interpretation of serum thyroid-stimulating hormone (TSH) and thyroxine (T4) levels. • Discuss the treatment options available for hypothyroidism, primarily focusing on thyroid hormone replacement therapy. 	member of unit
IV Cushing Syndrome	<ul style="list-style-type: none"> • Discuss the etiology of Cushing Syndrome, including endogenous overproduction of cortisol by the adrenal glands and exogenous sources of glucocorticoids. • Identify the key clinical features of Cushing Syndrome, such as central obesity, facial rounding, skin changes (e.g., purple striae, easy bruising), muscle weakness, and osteoporosis. • Understand the initial screening tests for suspected Cushing Syndrome, including the dexamethasone suppression test, 24-hour urinary free cortisol levels, and midnight salivary cortisol tests.. • Explore the treatment options for Cushing Syndrome depending on its etiology. 	<ul style="list-style-type: none"> •Bedside teaching •Duration 1 hour •Conducted by senior faculty member of unit

Rotation to Department of Surgery

Early Clinical Exposure Second Year MBBS Special senses and Endocrinology Module		
Session	Learning Objectives	Teaching Strategy
I Thyroid Nodule	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none">Describe the anatomical location and function of the thyroid gland, differentiate between benign and malignant thyroid nodules, and identify common signs and symptoms associated with thyroid nodules.Interpret results of basic diagnostic tests for thyroid nodules, including ultrasound and thyroid function tests, and understand their roles in the evaluation of a thyroid nodule.List the risk factors for developing thyroid nodules and discuss the epidemiology of thyroid nodules, including the prevalence and potential outcomes.Apply clinical reasoning to case studies involving thyroid nodules, formulating potential diagnostic strategies and considering when referral to a specialist is appropriate.	<ul style="list-style-type: none">Bedside TeachingDuration 1 hourConducted by senior faculty member of unit

<p style="text-align: center;">II</p> <p style="text-align: center;">Multi nodular Goiter</p>	<ul style="list-style-type: none"> • Define multinodular goiter and differentiate between non-toxic and toxic types. They will learn about the various causes and the pathophysiology underlying the development of these goiters. • Recognize the signs and symptoms of a multinodular goiter, including local effects on the trachea and esophagus, and systemic effects related to thyroid hormone imbalance. • Understand the roles of different diagnostic tools, such as thyroid function tests, ultrasound, and radioactive iodine scans, in assessing multinodular goiter and distinguishing it from other thyroid disorders. • Discuss the basic management strategies for multinodular goiter, including when medical therapy is appropriate versus when surgical intervention might be necessary, and they will consider the implications of these treatments on patient outcomes. 	<ul style="list-style-type: none"> • Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
<p style="text-align: center;">III</p> <p style="text-align: center;">CA Thyroid</p>	<ul style="list-style-type: none"> • Outline the main types of thyroid cancer, including papillary, follicular, medullary, and anaplastic, and explain the basic pathophysiological mechanisms • Identify the common clinical features associated with thyroid cancer, such as a palpable thyroid nodule, hoarseness, and lymphadenopathy. • Understand the steps involved in diagnosing thyroid cancer, including 	<ul style="list-style-type: none"> • Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit

	<p>the use of ultrasound-guided fine needle aspiration biopsy, and the roles of other imaging modalities and laboratory tests.</p> <ul style="list-style-type: none">• Describe of the treatment options available for thyroid cancer, focusing on the differences between surgical methods, radioactive iodine therapy, and when medical therapy might be used	
<p>IV</p> <p>Graves Diseases</p>	<ul style="list-style-type: none">• Define Graves' disease as an autoimmune disorder and explain how the production of thyroid-stimulating immunoglobulins leads to the overproduction of thyroid hormones (hyperthyroidism).• Recognize the common signs and symptoms of Graves' disease.• Understand the diagnostic criteria for Graves' disease, including the role of blood tests for thyroid hormones and thyroid-stimulating hormone (TSH), TSH receptor antibody testing, and• Discuss the basic management strategies for Graves' disease, covering antithyroid medications, beta-blockers to manage symptoms, radioactive iodine treatment, and surgical options.	<ul style="list-style-type: none">•Bedside teaching•Duration 1 hour•Conducted by senior faculty member of unit

Rotation to Department of Ophthalmology (Eye)

Early Clinical Exposure Second Year MBBS Special senses and Endocrinology Module		
Session	Learning Objectives	Teaching Strategy
I Blindness	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none"> • Understand the differences between complete blindness and legal blindness, and the various categories of visual impairment. • Identify and describe the common causes of blindness, both globally and regionally, including preventable and non-preventable factors. • Recognize the signs and symptoms that may indicate visual impairment or blindness. This objective focuses on practical skills to perform basic vision assessments that could be part of a general physical examination. • Discuss the broader impacts of visual impairment and blindness on an individual's quality of life, including mental health, education, and employment. 	<ul style="list-style-type: none"> • Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit
II Visual field defect	<ul style="list-style-type: none"> • describe what a visual field is and explain the importance of visual field testing in the • Identify and describe various types of visual field defects, such as homonymous hemianopia, bitemporal hemianopia, and central scotomas. • Understand the relationship between different visual field defects and the anatomical structures of the visual 	

	<p>pathway.</p> <ul style="list-style-type: none">• Correlate specific types of visual field defects with potential neurological causes, such as stroke, brain tumors, or glaucoma.• Discuss the methods and significance of visual field testing in clinical practice.• Describe how visual field tests are performed, such as through automated perimetry, and the role of these tests in diagnosing and monitoring conditions that affect the visual pathways.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hour• Conducted by senior faculty member of unit
<p>III</p> <p>Cataract</p>	<ul style="list-style-type: none">• Describe the basic pathophysiological changes that occur in the lens of the eye leading to cataract formation. This includes understanding the types of cataracts, such as nuclear, cortical, and posterior subcapsular, and their associated risk factors.• Recognize the common symptoms and signs of cataracts, including blurred vision, glare and halos around lights, and decreased color perception. They should learn how these symptoms impact daily activities and contribute to visual impairment.• Describe the key elements of diagnosing cataracts, including patient history, visual acuity testing, and slit-lamp examination.• Enlist indications for cataract surgery, the basic steps involved in procedures such as phacoemulsification, and the expected outcomes and potential complications of surgery.	<ul style="list-style-type: none">• Bedside teaching• Duration 1 hour• Conducted by senior faculty member of unit

Rotation to Department of Otolaryngology

Early Clinical Exposure Second Year MBBS Special senses and Endocrinology Module		
Session	Learning Objectives	Teaching Strategy
I Deafness	<p>At the end of the session students will be able to</p> <ul style="list-style-type: none">• Classify deafness into categories such as conductive, sensorineural, and mixed hearing loss. They should learn about the common etiologies contributing to each type, including genetic factors, infections, trauma, and exposure to ototoxic agents.• Recognize the signs and symptoms associated with different types of hearing loss. They should understand the diagnostic tests used in the assessment of hearing impairment, such as otoscopy, tuning fork tests, and audiometry, and how these tests help differentiate between types of deafness.• Discuss the broader impacts of hearing loss on communication, social interactions, education, and psychological well-being.• Describe the range of management strategies and rehabilitation options available for hearing loss, including medical treatments, surgical interventions like cochlear implants, and the use of hearing aids and other assistive listening devices..	<ul style="list-style-type: none">• Bedside Teaching• Duration 1 hour• Conducted by senior faculty member of unit

<p style="text-align: center;">II Hearing tests</p>	<ul style="list-style-type: none"> • Differentiate between various types of hearing tests, including pure tone audiometry, speech audiometry, tympanometry, and otoacoustic emissions. They should learn how each test is performed and what specific aspects of hearing each test evaluates. • Interpret basic results from hearing tests. They should understand how to read audiograms, recognize patterns indicative of conductive vs. sensorineural hearing loss, and appreciate the implications of these findings for clinical management. • Describe the clinical indications for performing specific hearing tests. This includes knowing when to order each type of test based on the patient's symptoms and medical history, as well as understanding the utility of these tests in diagnosing and monitoring various auditory and vestibular disorders. • Discuss the importance of hearing tests in the overall assessment and management of patients with hearing concerns. 	<ul style="list-style-type: none"> • Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
<p style="text-align: center;">III Nasal Obstruction</p>	<ul style="list-style-type: none"> • Describe the anatomical structures of the nasal cavity and how these structures contribute to normal nasal function.. • Recognize common etiologies of nasal obstruction, such as nasal polyps, deviated nasal septum, allergic rhinitis, and infectious rhinitis. • Assess the symptoms of nasal obstruction and perform basic nasal examinations using tools like the 	<ul style="list-style-type: none"> • Bedside teaching • Duration 1 hour • Conducted by senior

	<p>otoscope for visualization of the nasal passages..</p> <ul style="list-style-type: none">• Discuss the effects of nasal obstruction on patient quality of life, including sleep disturbances, difficulties in breathing, and changes in sense of smell.• Describe the basic treatment approaches, such as pharmacological therapies and when referral for surgical evaluation might be necessary.	faculty member of unit
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ECE Log Book

Student's Profile

Paste Photograph
(2x2 Size)

Name:_____

Roll No._____

Batch:_____

Class:_____

Session:_____

Contact Detail: -----

Phone:_____ Mobile:_____

Email:_____

Hostelite/Dayscholar:_____

Parents / Guardian Contact #(Mobile)_____

Landline_____

Postal Address:_____

Guardian Email:_____

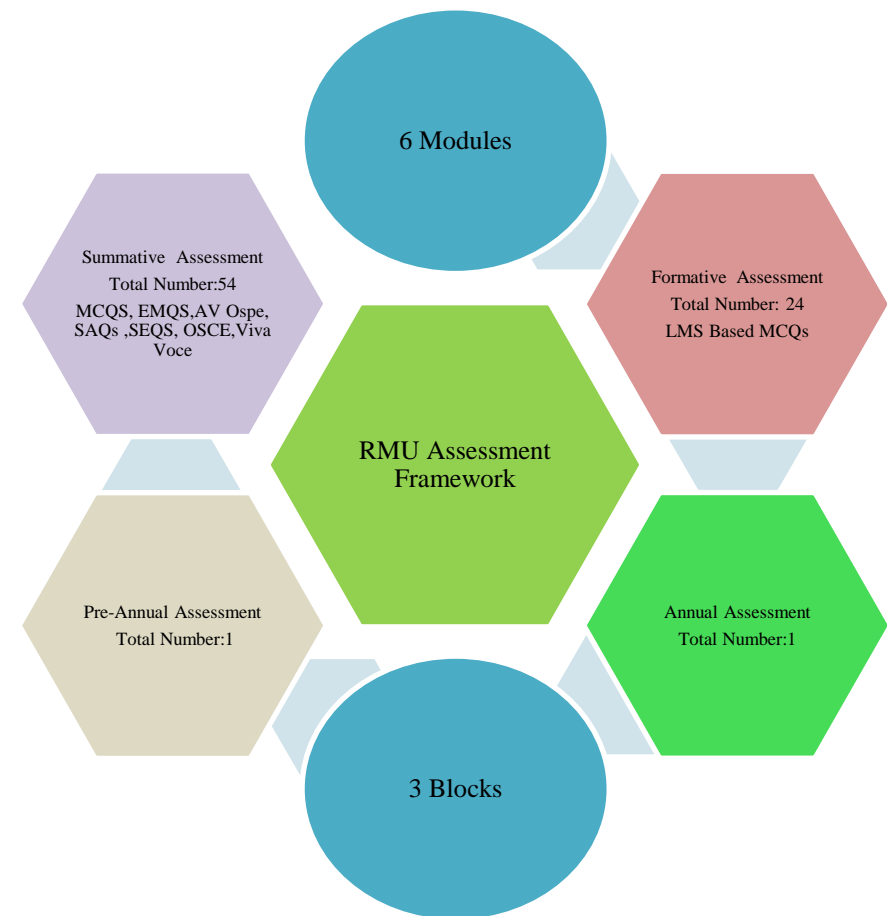
Proforma For Early Clinical Exposure for Second Year MBBS

Roll Number: _____

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➤ Section-XI

Assessment Policies



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)
 - 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
 - Audio Visual OSPE (AVOSPE): This comprises of stations using PowerPoint slides with images animations and videos
 - Laboratory OSPE (Lab OSPE): This comprises of stations focused on practical (hands on performance) components from core subject areas
 - 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 Second Year MBBS

Domains: C-Core Subject (70%) Levels C1-C2, HV- Horizontal & Vertical Integration (20%) Levels C2-C3, S- Spiral Integration (10%) Levels C2-C3																																		
End of Module Assessment	Subject	Theory (Cognitive) Assessment																		Practical (Skill & Attitude) Assessment										Grand Total	Total Time of Module Assessment			
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE			Total Practical Marks		
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva				Copy	Total
First Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessment of 30 MCQs (10 MCQs per Subject)																																		
End of Module Assessment	Subject	Theory (Cognitive) Assessment																		Practical (Skill & Attitude) Assessment										Grand Total	Total Time of Module Assessment			
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE			Total Practical Marks		
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva				Copy	Total
Second Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessment of 30 MCQs (10 MCQs per Subject)																																		

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

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

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

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

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

3.2.4 Continuous Internal Assessment (CIA)

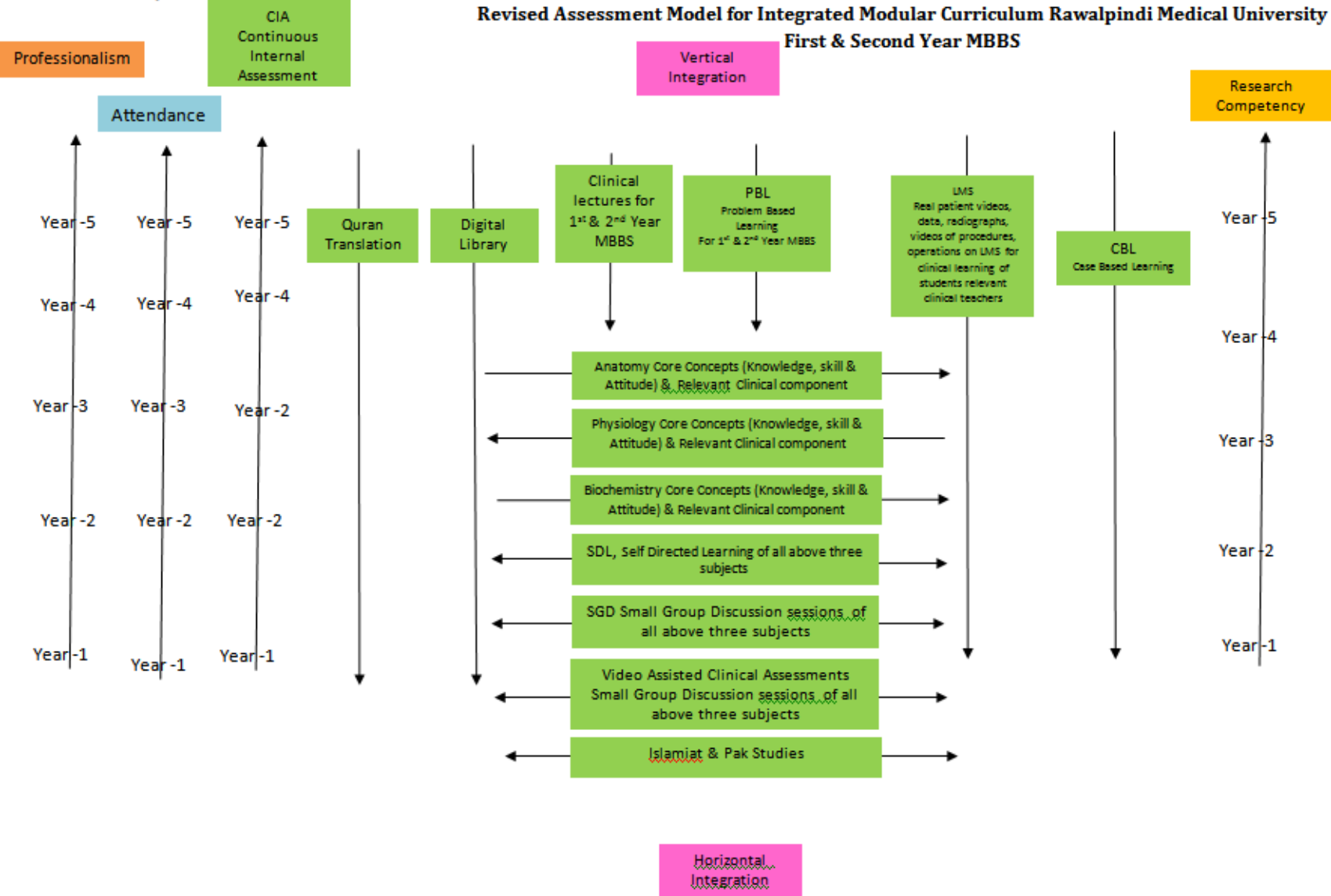
Continuous Internal Assessment means the assessment based on tests and assignments given to the students during an academic period.

Break up of internal assessment is as follows:

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



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

Block	Sr. #	Module – 1 GIT Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – I	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 Minutes			3 Assessments	
	Sr. #	Module – 2 Renal Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – I Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative 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				
			Total	5 Hours & 30 Minutes			2 Assessments	

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

Block	Sr. #	Module – 3 Reproduction Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – II	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			3 Hours & 05 Minutes			3 Assessments	
	Sr. #	Module – 4 CNS Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – II Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative 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				
			Total	5 Hours & 30 Minutes			2 Assessments	

No. of Assessments of Physiology for Second Year MBBS (Block- III):

Block	Sr. #	Module – 5 Special Senses Module Components	Type of Assessment s	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
Block – III	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 Minutes			3 Assessments	
	Sr. #	Module – 6 Endocrinology Module Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes					
	Total				3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – III Assessment	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative 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					
			Total	5 Hours & 30 Minutes				2 Assessments	

Total Time of Physiology Assessments for Second Year MBBS:

Module	Summative Assessment Time	Formative Assessment Time	Total Assessments Time
GIT Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Renal Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -I	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Reproduction Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
CNS Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -II	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Special Senses Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Endocrinology 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
Second 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

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

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

Block	Sr. #	Module – 1 GIT Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – I	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 Minutes			3 Assessments	
	Sr. #	Module – 2 Renal Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – I Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative 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				
			Total	5 Hours & 30 Minutes			2 Assessments	

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

Block	Sr. #	Module – 3 Reproduction Module Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
Block – II	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 Minutes			3 Assessments	
	Sr. #	Module – 4 CNS Module Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes					
	Total				3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – II Assessment	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative 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					
			Total		5 Hours & 30 Minutes			2 Assessments	

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

Block	Sr. #	Module – 5 Special Senses Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – III	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 Minutes			3 Assessments	
	Sr. #	Module – 6 Endocrinology Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – III Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative 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				
			Total	5 Hours & 30 Minutes			2 Assessments	

Total Time of Anatomy Assessments for Second Year MBBS:

Module	Summative Assessment Time	Formative Assessment Time	Total Assessments Time
GIT Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Renal Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -I	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Reproduction Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
CNS Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -II	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Special Senses Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Endocrinology 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
Second 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

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

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

Block	Sr. #	Module – 1 GIT Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – I	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 Minutes			3 Assessments	
	Sr. #	Module – 2 Renal Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – I Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative 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				
			Total		5 Hours & 30 Minutes			2 Assessments

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

Block	Sr. #	Module – 3 Reproduction Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – II	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 Minutes			3 Assessments	
	Sr. #	Module – 4 CNS Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – II Assessment	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative 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				
			Total		5 Hours & 30 Minutes			2 Assessments

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

Block	Sr. #	Module – 5 Special Senses Module Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
Block – III	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 Minutes			3 Assessments	
	Sr. #	Module – 6 Endocrinology Module Components	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative Assessment Time			
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes					
	Total				3 Hours & 35 Minutes			4 Assessments	
	Sr. #	Block – III Assessment	Type of Assessments	Total Assessments Time			No. of Assessments		
				Assessment Time	Summative Assessment Time	Formative 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					
			Total		5 Hours & 30 Minutes			2 Assessments	

Total Time of Biochemistry Assessments for Second Year MBBS:

Module	Summative Assessment Time	Formative Assessment Time	Total Assessments Time
GIT Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Renal Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -I	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Reproduction Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
CNS Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -II	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Special Senses Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Endocrinology 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
Second 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

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

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

Block	Sr. #	Module – 1 GIT Module Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
Block – I	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
	Sr. #	Module – 2 Renal Module Components	Type of Assessments	Total Assessments Time		No. 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

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

Block	Sr. #	Module – 3 Reproduction Module Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
Block – II	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
	Sr. #	Module – 4 CNS Module Components	Type of Assessments	Total Assessments Time		No. 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

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

Block	Sr. #	Module – 5 Special Senses Module Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
Block – III	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
	Sr. #	Module – 6 Endocrinology Module Components	Type of Assessments	Total Assessments Time		No. 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

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

Module	Formative Assessment Time	Total Assessments Time
GIT Module	45 Minutes	45 Minutes
Renal Module	45 Minutes	45 Minutes
Block -I		
Reproduction Module	45 Minutes	45 Minutes
CNS Module	45 Minutes	45 Minutes
Block -II		
Special Senses Module	45 Minutes	45 Minutes
Endocrinology Module	45 Minutes	45 Minutes
Block -III		
Pre-Annual Examination	.....	35 Minutes
Second Professional	.....	60 Minutes
Grand Total	4 hours and 30 minutes	6 hours and 5 minutes

Total Teaching Hours vs Total Assessment Hours

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

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 2nd Pre-Annual Examination 2024

- Total Marks: 845

Total marks =800 Marks			
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 Ophthalmology 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		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 Marks	Total 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 Second year MBBS - Block -I

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

285 Marks	Gynae & Obs	4 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 Second year MBBS - Block -II

Block	Subjects	Theory (Knowledge)	Practical (Skill/attitude)	Total marks	Total marks (Core subjects + Integrated Subjects)
Block II (Core subjects + Integrated Subjects) 285 Marks	Anatomy	50	30	80 marks	240+ 45 = 285 marks
	Physiology	50	30	80 marks	
	Biochemistry	50	30	80 marks	
	Total			240 marks	
	Integrated Subjects			45 Marks	
	Community Medicine /Research	4 Marks			
	Family Medicine	3 Marks			
	Orthopedics	3 Marks			
	Radiology	3 Marks			
	Medicine	3 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 Second year MBBS - Block -III

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

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

Subjects	MCQs			EMQ			SAQ			SEQ			Total marks
	Module -1	Module- 2	Marks	Module -1	Module- 2	Marks	Module -1	Module- 2	Marks	Module -1	Module- 2	Marks	
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 Integrated Subjects			35	-		-	-		-	-		-	35
Total	110		110	3		15	6		30	3		30	185

Block -I Practical Component (Skill & Attitude)

Subjects	Lab OSPE			Iospe			OSCE			Total stations	Total 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	Number of Stations of Module -1	Number of Stations of Module -2	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 (Reproduction Module) & Module 4(CNS module) - Block -II

Block -II Theory Component (Knowledge)

Subjects	MCQs			EMQ			SAQ			SEQ			Total marks
	Module -1	Module-2	Marks	Module -1	Module-2	Marks	Module -1	Module-2	Marks	Module -1	Module-2	Marks	
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 Integrated Subjects			35	-		-	-		-	-		-	35
Total	110		110	3		15	6		30	3		30	185

Block -II Practical Component (Skill & Attitude)

Subjects	LabOSPE			Iospe			OSCE			Total stations	Total 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	Number of Stations of Module -1	Number of Stations of Module -2	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 (Special Senses Module) & Module 6 (Endocrinology Module) - Block -III

Block -III Theory Component (Knowledge)

Subjects	MCQs			EMQ			SAQ			SEQ			Total marks
	Module -1	Module-2	Marks	Module -1	Module-2	Marks	Module -1	Module-2	Marks	Module -1	Module-2	Marks	
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 Integrated Subjects			25	-		-	-		-	-		-	25
Total	100		100	3		15	6		30	3		30	175

Block -III Practical Component (Skill & Attitude)

Subjects	LabOSPE			I OSPE			OSCE			Total stations	Total 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	Number of Stations of Module -1	Number of Stations of Module -2	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 Second Year MBBS 2024

Block -I	Theory component (Knowledge)				Practical component (Skill & Attitude)			Total time required for Block – I pre annual assessment is 8 hrs and 25 minutes
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	
Total number of questions	110	6	3	3	9	3	8	
Time required for each component	110 x 1 min	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	
	110 mins	60 mins	30 mins	25 mins	22.5 mins	7.5 mins	20 mins	
Total time	110+60+30+25 = 225 mins (4hrs and 25 mins)				22.5+7.5+20 = 50 mins/ round of 20 students			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 component (Knowledge)				Practical component (Skill & Attitude)			Total time required for Block – II pre annual assessment is 8 hrs and 25 minutes
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	
Total number of questions	110	6	3	3	9	3	8	
Time required for each component	110 x 1 min	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	
	110 mins	60 mins	30 mins	25 mins	22.5 mins	7.5 mins	20 mins	
Total time	110+60+30+25 = 225 mins (4hrs and 25 mins)				22.5+7.5+20 = 50 mins/ round of 20 students 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 component (Knowledge)				Practical component (Skill & Attitude)			Total time required for Block – III pre annual assessment is 8 hrs and 15 minutes
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	
Total number of questions	100	6	3	3	9	3	8	
Time required for each component	100 x 1 min	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	
	100 mins	60 mins	30 mins	25 mins	22.5 mins	7.5 mins	20 mins	
Total time	100+60+30+25 = 225 mins (4hrs and 15 mins)				22.5+7.5+20 = 50 mins/ round of 20 students			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:
 - 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.
 - 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.
 - 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 Second 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 Second 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 Second 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 Second Professional MBBS will be held at the end of Second 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 Second Annual Professional Examination and four papers in the Second Annual professional Examination.

Paper	Second 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. **Second Professional Examination Total Marks = 600***
 - 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 Second and second year MBBS .CIA for each block is 90 marks and this score will be equally distributed to the written Assessment (45marks) 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.

Second 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.

Second year MBBS	Number of LabOSPE Stations	Number of iOSPE Stations	Number of OSCE Stations	Number of table VIVA
Block -I	5	3	4	3
Block -II	5	3	4	3
Block -III	4	3	5	3
Second Year MBBS	Number of LabOSPE Stations	Number of iOSPE Stations	Number of OSCE Stations	Number of table VIVA
Block -I	4	3	5	3
Block -II	5	3	4	3
Block -III	5	3	4	3

- **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 & 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 Second Year MBBS 2024 (Batch 51)

- Total Second 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
Block 1 90 Marks	Anatomy	30 marks	15 marks	15 marks	90 Marks
	Physiology	30 marks	15 marks	15 marks	
	Biochemistry	30 marks	15 marks	15 marks	
Block 2 90 Marks	Anatomy	30 marks	15 marks	15 marks	90 Marks
	Physiology	30 marks	15 marks	15 marks	
	Biochemistry	30 marks	15 marks	15 marks	
Block 3	Anatomy	30 marks	15 marks	15 marks	90 Marks
	Physiology	30 marks	15 marks	15 marks	

90 Marks	Biochemistry	30 marks	15 marks	15 marks	
Total marks					270 Marks

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

Blocks	Modules	Anatomy	Physiology	Biochemistry	Total
Block 1 1470 Marks	Module 1	200	200	200	600
	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	490	490	490	1470
Block 2 1470 Marks	Module 1	200	200	200	600
	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	490	490	490	1470
Block 3 1470 Marks	Module 1	200	200	200	600
	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	490	490	490	1470
Total Marks		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 Second professional Examinations 2024

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

A: Second Professional Examination (70%)

A: Second 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 <ul style="list-style-type: none">• Community Medicine• C Public Health/Research• Behavioural Sciences• Pathology• Pharmacology• Radiology• Family Medicine• Surgery• Medicine• Gynae C Obs• Orthopedics• Pediatrics• Surgery• Ophthalmology• Otorhinolaryngology	11%	73 Marks

<ul style="list-style-type: none"> • Early Clinical Exposure • ALPHA and General Education Cluster (GEC) 	2%	10 Marks
Total Marks		630 Marks

B: Blockwise Distribution of Marks

Total Annual Professional Marks (70%)	BLOCK 1 Marks	BLOCK 2 Marks	BLOCK 3 Marks	Total Marks
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 Second Year MBBS

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

Block	Subjects	Theory	Practical	Total marks	Total marks Core Subject + Integrated Subjects
Block 2	Anatomy	38 marks	40 marks	78 marks	181+29 = 210 marks
	Physiology	34 marks	30 marks	64 marks	
	Biochemistry	14 marks	25 marks	39 marks	
	Total	86	95	181 Marks	
	Integrated Subjects			29 Marks	
	• Community Medicine /Research	4 Marks			
	• Family Medicine	1 Marks			
	• Orthopedics	2 Marks			

210 Marks	• Radiology	2 Marks			
	• Medicine	3 Marks			

	• Gynae C Obs	1 Marks			
	• Behavioural Sciences	4 Marks			
	• Pathology	2 Marks			
	• ECE		5 Marks		
	• ALPHA and GEC		5 Marks		
Total marks		181+29 = 210 marks			

Block	Subjects	Theory	Practical	Total marks	Total marks Core Subject + Integrated Subjects
210 Marks	Anatomy	25 marks	30 marks	55 marks	183+27 = 210 marks
	Physiology	48 marks	35 marks	83 marks	
	Biochemistry	15 marks	30 marks	45 marks	
	Total	88	95	183 marks	
	Integrated Subjects			27 Marks	
	• Community Medicine	3 Marks			
	• Behavioural Sciences	2 Marks			
	• Medicine	2 Marks			
	• Family medicine	1 Marks			
	• Gynae C Obs	1 Marks			
	• Radiology	1 Marks			
	• Pediatrics	1 Marks			
	• Otorhinolaryngology	1 Marks			
	• Ophthalmology	1 Marks			
	• Pathology	2 Marks			
	• Pharmacology	2 Marks			
	• ECE		5 Marks		
	• ALPHA and GEC		5 Marks		
Total marks		183+27 = 210 marks			
GRAND TOTAL MARKS		630 Marks			

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

Subject	Theory			Practical			Total Marks
	Component	No of Items	Marks	Component	No of Items	Marks	
Block 1 (GIT s MSK-1) Total Annual marks=210	Section I- MCQ	75	75	LabOSPE	5	25	210
	Section II- SEQ	6	30	iOSPE	3	15	
			OSCE	4	20		
			OSVE	3	45		
	CIA = 90 Marks		Continuous Internal Assessment (30%)		45	Continuous Internal Assessment (30%)		45	90
Total Annual marks+ CIA =210+90= 300	Total Marks		150	Total Marks		150	300
Block 2 (MSK-2 Blood and Immunity Total Annual marks=210	Section I- MCQ	75	75	LabOSPE	5	25	210
	Section II- SEQ	6	30	iOSPE	3	15	
			OSCE	4	20		
			OSVE	3	45		
	CIA = 90 Marks		Continuous Internal Assessment (30%)		45	Continuous Internal Assessment (30%)		45	90
Total Annual marks+ CIA =210+90= 300	Total Marks		150	Total Marks		150	300
Block 3 (CVS Respiration) Total Annual marks=210	Section I- MCQ	75	75	LabOSPE	4	20	210
	Section II- SEQ	6	30	iOSPE	3	15	
			OSCE	5	25		
			OSVE	3	45		
	CIA = G0 Marks		Continuous Internal Assessment (30%)		45	Continuous Internal Assessment (30%)		45	90
Total Annual marks + CIA =210+G0= 300	Total Marks		150	Total Marks		150	300
Grand Total Marks							G00

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

Themes	Discipline	Theory				Practical (OSPE)			OSVE	Marks	%	Total Marks per subject	
		No of MCQs (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	%
Core s 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 Subjects	Communit y Medicine C Public Health/Research	4	-	3	4	-	-	-	-	-	-	4	14
	Behavioural Sciences	2	-	1	2	-	-	-	-	-	-	2	
	Pathology	2	-	2	2	-	-	-	-	-	-	2	
	Radiology	1		1								1	
	Gynae C Obs	1		1								1	
	Medicine	1		1								1	
	Family Medicine	1		1								1	
	Paediatrics	1		1								1	
	Surgery	1		1								1	
	Pharmacology	3	-	3	3	-	-		-	-	-	3	
Spirally Integrated Subjects	ECE	-	-	-		-	-	1	-	5	5	5	5
	ALPHA and GEC	-	-	-		-	-	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

Theme	Subject	Theory			Practical			OSVE		Total Marks per subject	
		No of MCQs (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
Vertically Integrated Subjects	Community Medicine C Public Health	4	-	4	-	-	-	-	-	4	15
	Behavioural Sciences	4	-	4	-	-	-	-	-	4	
	Pathology	2	-	2	-	-	-	-	-	2	
	Family Medicine	1								1	
	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		75	6x5=30	105	5x5=25	3x5=15	4x5=20	3x15=45	105	210	100
Total		105			105				105+105=210		

H: 1st Professional Examination 2024 (Batch 51)

**Block 3 Assessment
CVS Respiratory Modules**

Themes	Discipline	Theory			Practical			OSVE		Total Marks per subject	
		No of MC Qs (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	Marks	%
Core s Horizontally Integrated Subjects	Anatomy C Applied /Clinical	15	2	25	1	1	1	1	30	55	26
	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
Vertically Integrated Subjects	Community Medicine C Public Health	2	-	2	-	-	-	-	-	2	13
	Behavioural Sciences	2	-	2	-	-	-	-	-	2	
	Pathology	2	-	2	-	-	-	-	-	2	
	Medicine	2		2						2	
	Family medicine	1		1						1	
	Gynae C Obs	1		1						1	
	Radiology	1		1						1	
	Pediatrics	1		1						1	
	Otorhinolaryngology	1		1						1	
	Ophthalmology	1		1						1	
	Pathology	2		2						2	
	Pharmacology	1	-	1	-	-	-	-		1	
Spirally Integrated Subjects	ECE	-	-	-	-	-	1	-	5	5	
	ALPHA and GEC	-	-	-	-	-	1	-	5	5	
Total		75	6x5=30	105	4x5=20	3x5=15	5x5=25	3x15=45	105	210	100
Total		105			105				105+105=210		

Section-XII

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.

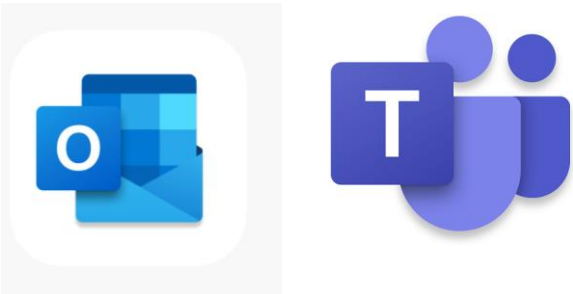
Features:

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

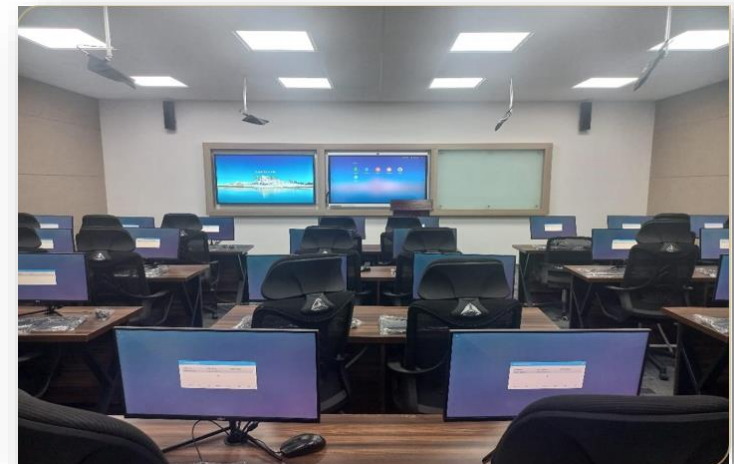
Academic Module

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

The Department of Medical Education (DME) creates and manages the modules/Sessions/Batches etc.


Faculty and Students are directly engaged with their profiles, Sessions, Timetables, and Academic Calander.

Sub Modules:

- a) Configuration
 - Campuses/ Hospital
 - Departments
 - Venues
 - Batches
 - Programs
- b) Academic
 - Module
 - Attendance
 - Schedules
 - Event

Calendar A few screenshots are attached below as a reference.

Teacher Attendance



- Dashboard
- Academic
- Settings

DR. ARJUNAL HANZOOB MUGHAL

MY PROFILE

MY ACADEMIC SESSIONS

Unattended

ATTENDED

Show

10

entries

Search

ID	BATCH	START/END	SUBJECT	TOPIC	STATUS	ACTION
1	1st Year | UG5 | Even Roll No.	16 Feb. 2023 12:00 am / 03:00 pm	Anatomy	Introduction To general Anatomy	Attended	
2	1st Year | UG5 | Even	17 May. 2023 10:00 am / 11:00 am	Anatomy	Muscle I	Attended	
3	1st Year | UG5 | Even Roll No.	29 Aug. 2023 10:00 am / 11:00 am	Anatomy	Development of CVS 1	Attended	
4	1st Year | UG5 | Odd Roll No.	30 Aug. 2023 10:00 am / 11:00 am	Anatomy	Development of CVS 1	Attended	
5	1st Year | UG5 | Odd Roll No.	31 Aug. 2023 10:00 am / 11:00 am	Anatomy	Development of CVS 11	Attended	
6	1st Year | UG5 | Even Roll No.	04 Sep. 2023 10:00 am / 11:00 am	Anatomy	Development of CVS 11	Attended	
7	1st Year | UG5 | Odd Roll No.	04 Sep. 2023 10:00 am / 11:00 am	Anatomy	GA CVS 11	Attended	
8	1st Year | UG5 | Odd Roll No.	06 Sep. 2023 10:00 am / 11:00 am	Anatomy	Development of CVS 111	Attended	
9	1st Year | UG5 | Even Roll No.	11 Sep. 2023 10:00 am / 11:00 am	Anatomy	Development of CVS 111	Attended	
10	1st Year | UG5 | Even Roll No.	12 Sep. 2023 10:00 am / 11:00 am	Anatomy	Development of CVS 4	Attended	

Showing 1 to 10 of 12 entries

Previous

1

Next

Student Attendance

DR. ARSALAN MANZOOR MUGHAL

ATTENDANCE SHEET

Department

Anatomy

Teacher

DR. ARSALAN MANZOOR MUGHAL

Session Type

LGIS

Session Date

16 Feb. 2023

Batch

Even Roll No.

Topic

Introduction To general Anatomy

Download Report

NAME	ROLL NO	ATTENDANCE
ABEERA ASAD	2	Present
ADDAN FATIMA	4	Present
AENA REHMAN	6	Present
AIMA ALI	8	Present
AIMAN SARFRAZ	10	Absent
AIMEN JAMIL	12	Present
ALEESHA ZAFAR	14	Absent
ALISHA ZEESHAN	16	Present
Alishba Sikander	18	Present
AMAL ABBAS	20	Absent
AMNA	22	Present
AMNA IDREES	24	Present
Amna Zafar	26	Present

Total Students In Session : 100

Total Present : 177

Total Absent : 3

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

List of Students (359)

ALL	ROLL #	STUDENT	ACADEMIC YEAR INFO	CARD TYPE	ALREADY PRINTED	LAST PRINTED
<input checked="" type="checkbox"/>	30	 Name CNIC	Academic Year : 1st Year Batch : 50 Program : Bachelor of Medicine and Bachelor of Surgery (MBBS)	Non Boarder	Yes	20 Feb, 2023 01:42 am
<input checked="" type="checkbox"/>	1	 Name CNIC	Academic Year : 1st Year Batch : 50 Program : Bachelor of Medicine and Bachelor of Surgery (MBBS)	Non Boarder	Yes	18 Feb, 2023 09:03 am
<input checked="" type="checkbox"/>	254	 Name CNIC	Academic Year : 1st Year Batch : 50 Program : Bachelor of Medicine and Bachelor of Surgery (MBBS)	Non Boarder	Yes	07 Mar, 2023 10:31 am
<input checked="" type="checkbox"/>	69	 Name CNIC	Academic Year : 1st Year Batch : 50 Program : Bachelor of Medicine and Bachelor of Surgery (MBBS)	Non Boarder	Yes	18 Feb, 2023 09:03 am

E-card Printing

**RAWALPINDI MEDICAL UNIVERSITY**
Tipu Road, Rawalpindi
Telephone: +92-51-9330050-4 (+92-51-9290755)
Email: info@rmur.edu.pk


SHAKEEL AHMAD S/O GULA JAN

Roll No: 380Batch No: 49

Session: 2021-22Valid Upto: 2021-22

Address: RMU, BOYS, HOSTEL, NO.1, TIPU, ROAD, RAWALPINDI

Tel: 03309285156Mobile: 03309285156


Vice Chancellor

Digital Library

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BRITISH LIBRARY

CONTACTS

NAVIGATION MAP



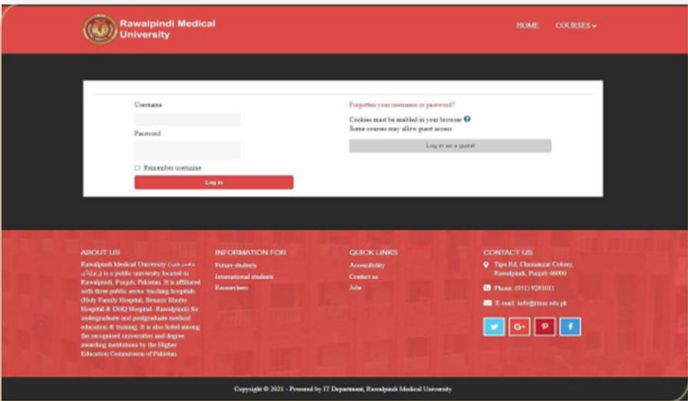
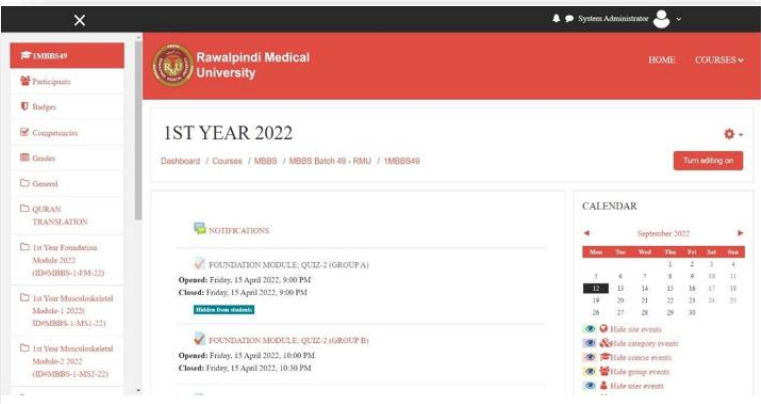
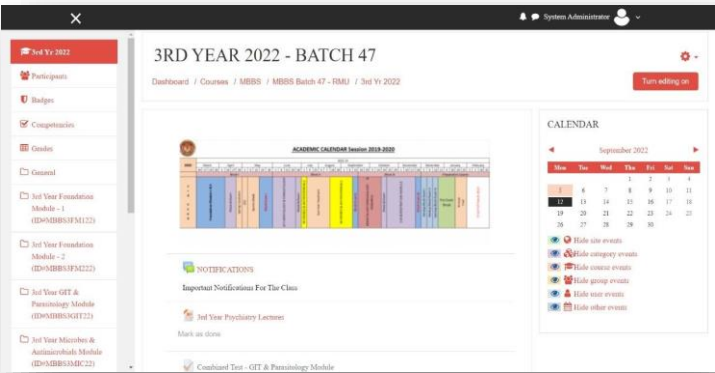
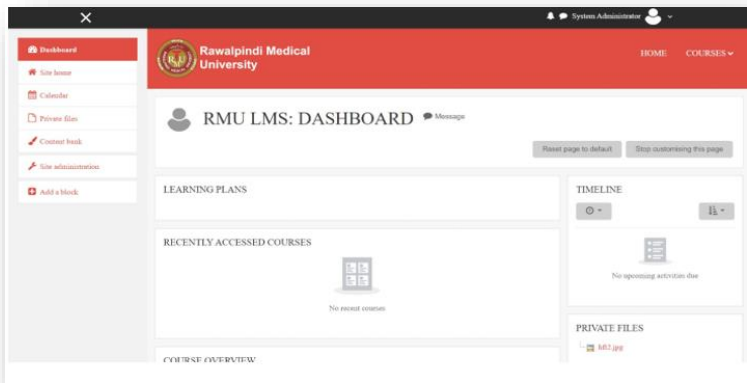
Rawalpindi Medical University, Rawalpindi

Institutional Representative	Mr. Farooq Ahmad Khan
Designation	IT Manager
E - Mail	info@rmur.edu.pk
Phone Number	+92 (0)51 - 5952012
Website	http://www.rmur.edu.pk

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 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 Illustrated 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
Pediatrics	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/

Section-XIII

Quality Assurance & Quality Enhancement

- **Student Feedback Proforma**
- **Student Report**
- **Faculty Report**
- **Swot Analysis**
- **Quality Enhancement Cell (QEC) Report**

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

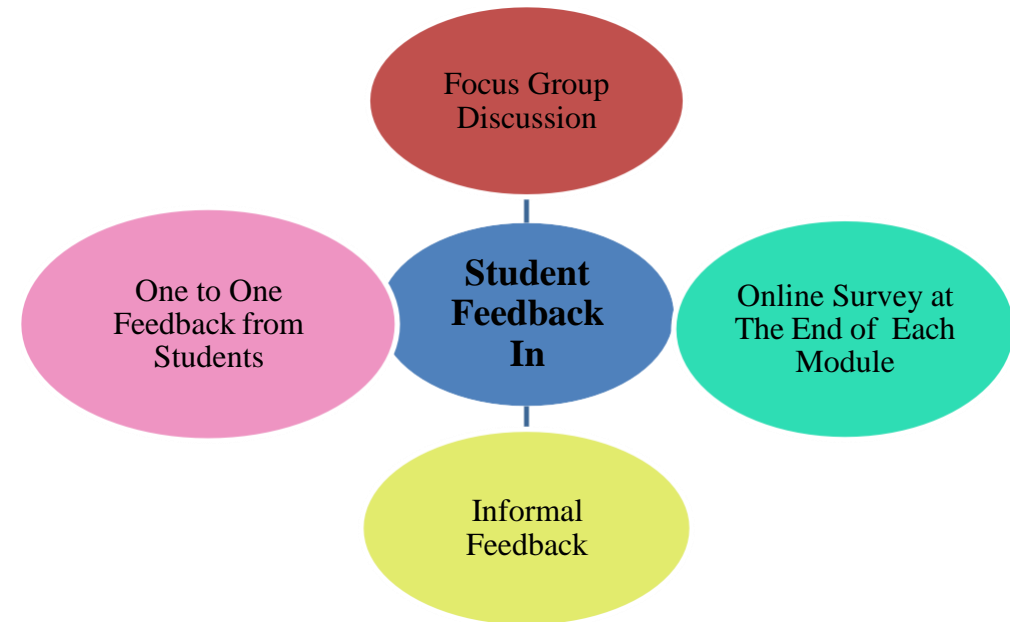
Feedback is received from students in more formal settings. These include:

- **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	Agree	Uncertain	Disagree	Strongly Disagree
The module objectives were informed.					
At the beginning of module study guide was available.					
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	Agree	Uncertain	Disagree	Strongly Disagree
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	Strongly Disagree
The module stimulated my interest.					
Ideas were presented clearly.					

Learning Resources

Questionnaire	Strongly Agree	Agree	Uncertain	Disagree	StronglyDisagree
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

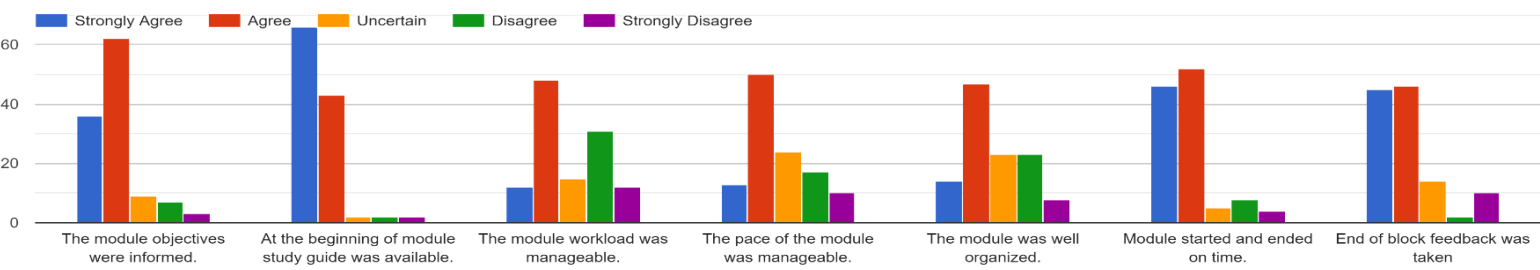
Questionnaire	Strongly Agree	Agree	Uncertain	Disagree	StronglyDisagree
Class tests were conducted regularly.					
Class tests were helpful					
Test difficulty was appropriate.					
Written Assessment was as per Table ofSpecifications.					
OSPE Exam was as per Table ofSpecification					
Table of Specification was shared					

LMS and its working

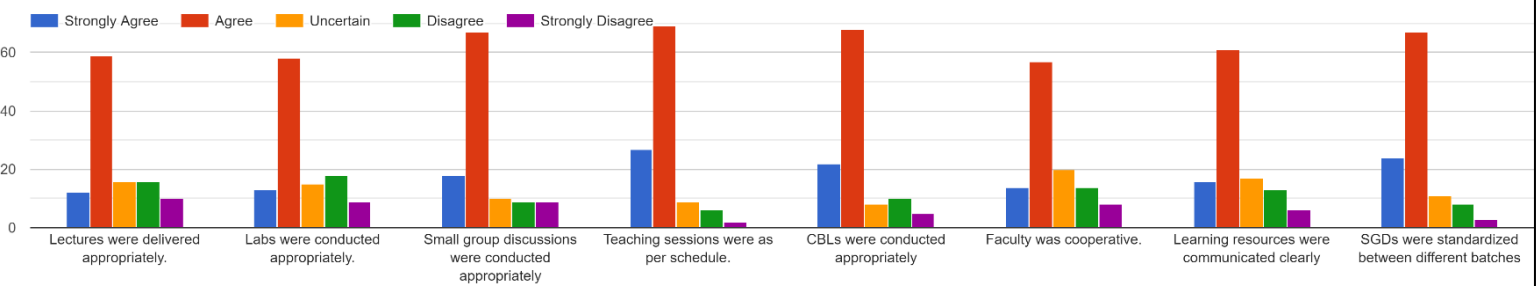
Questionnaire	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
Easy Access to LMS					
Module Content was Available					

Student Feedback Report

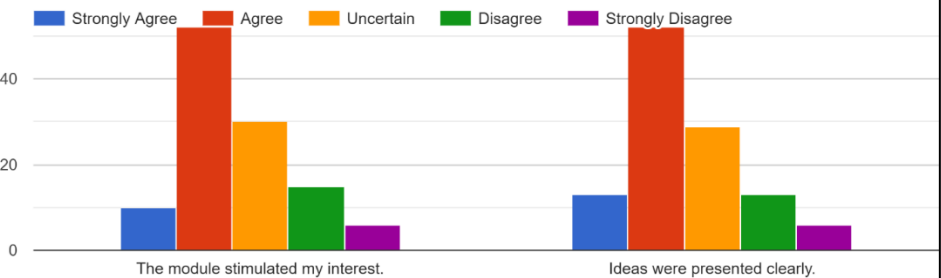
Module Content & Organization



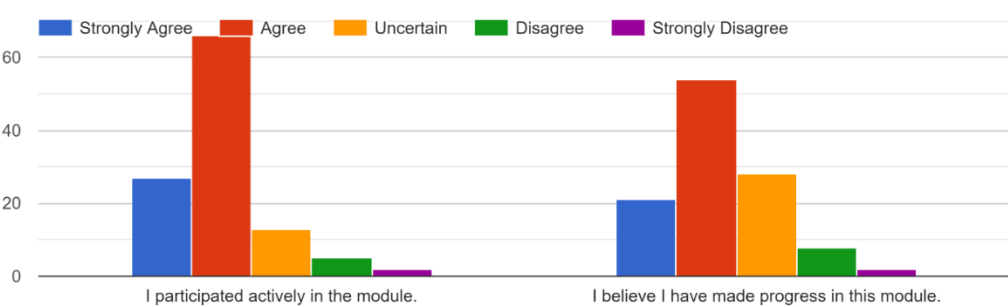
Learning Environment and Teaching Methods



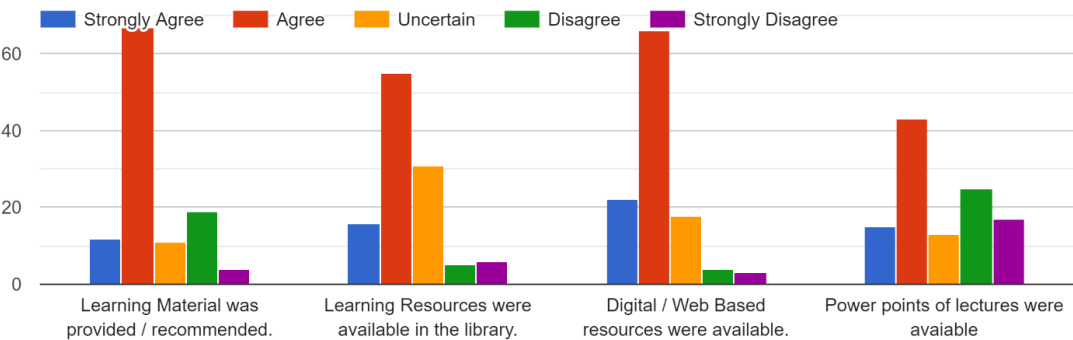
Quality of Delivery



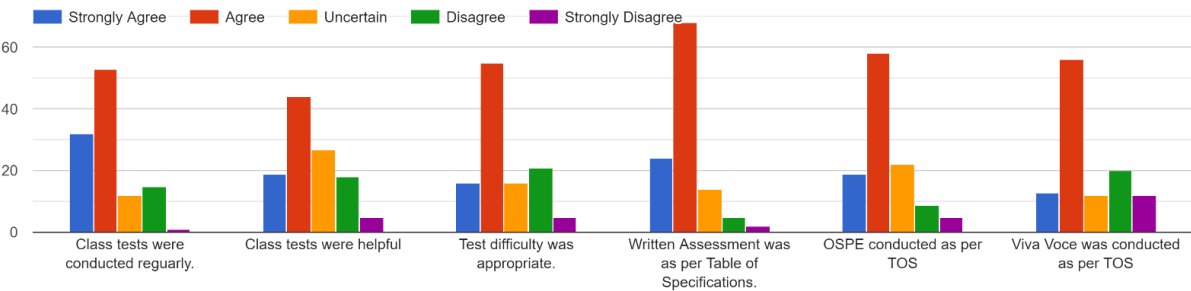
Student Contribution



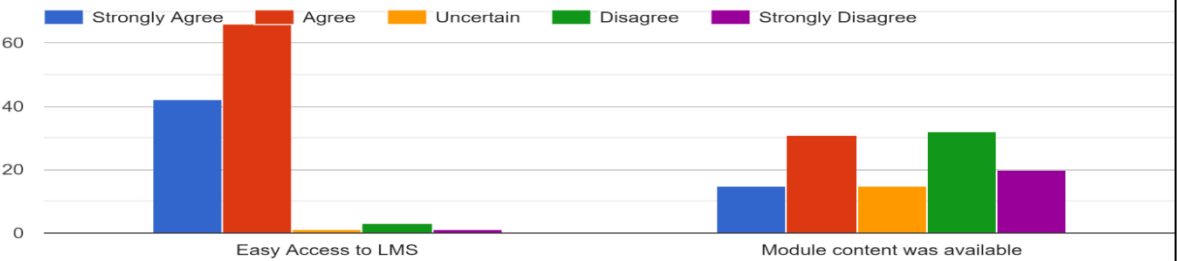
Learning Resources



Assessments

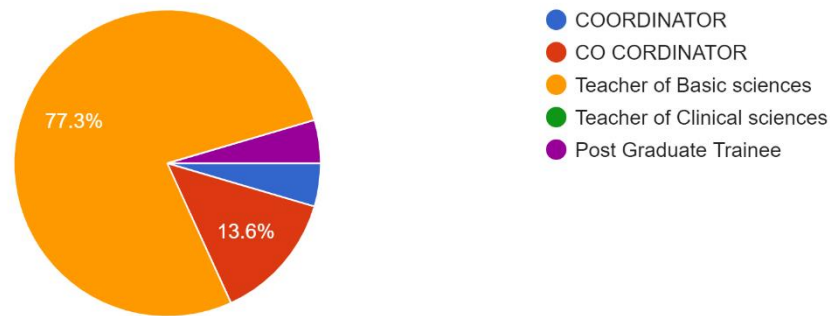


LMS and its working

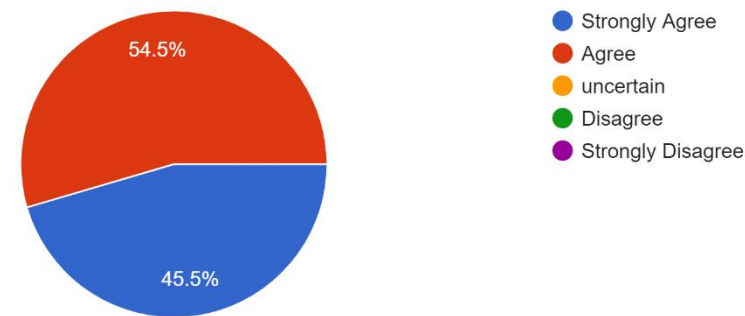


Faculty Feedback Report

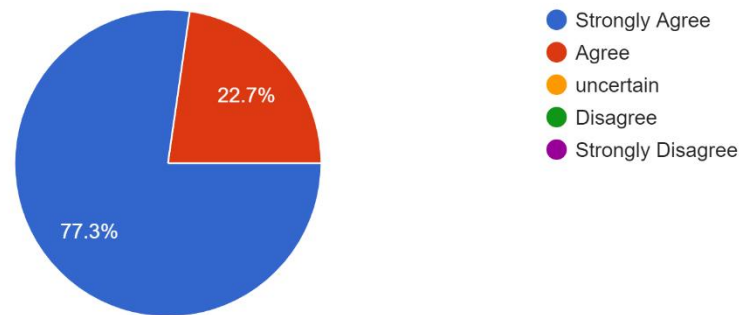
Role In Module
22 responses



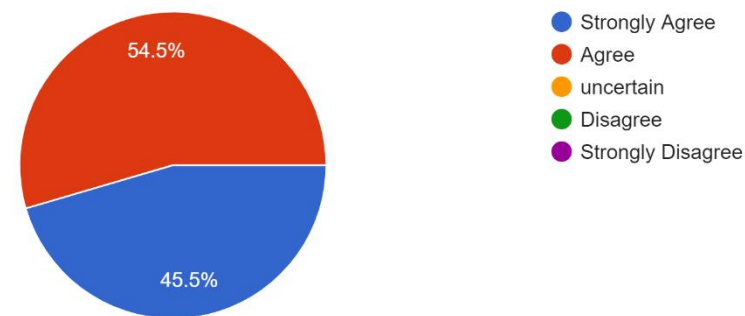
Timetable was timely conveyed to faculty
22 responses



Study Guide was available
22 responses

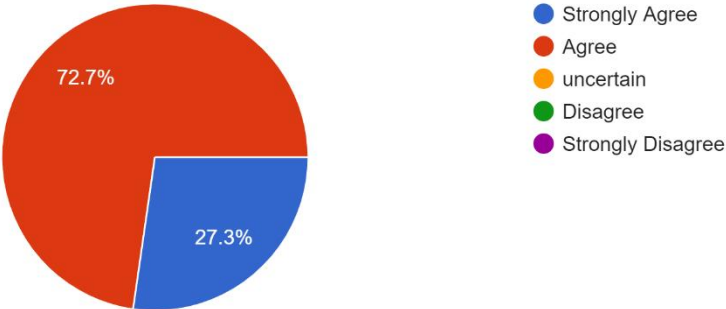


All the module objectives were covered
22 responses



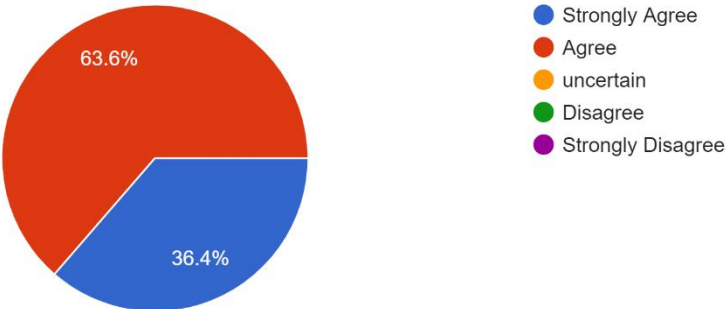
The module duration was appropriate

22 responses



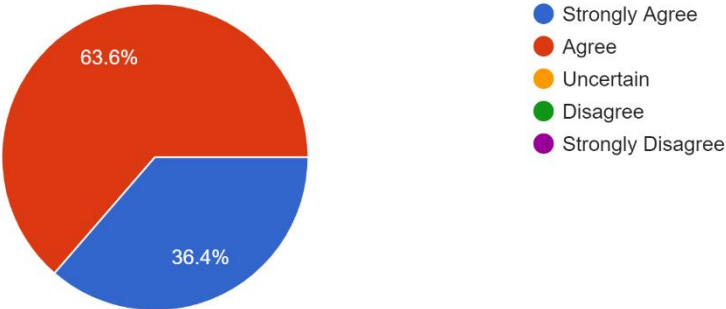
The module started and ended on time

22 responses



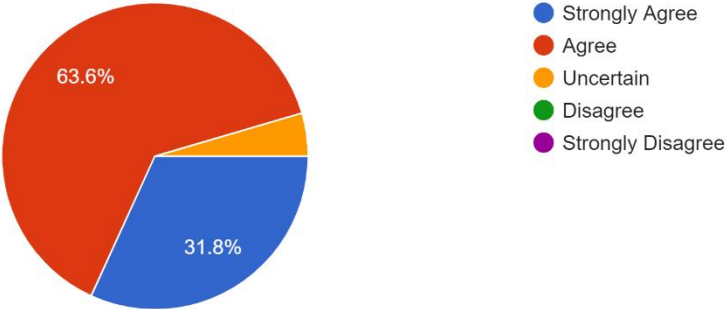
Teaching sessions were as per schedule

22 responses



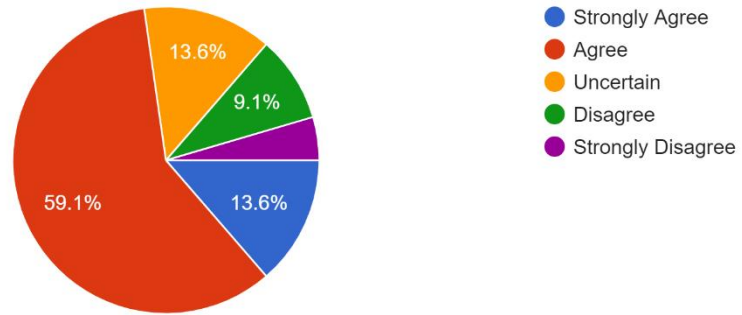
Faculty was cooperative

22 responses



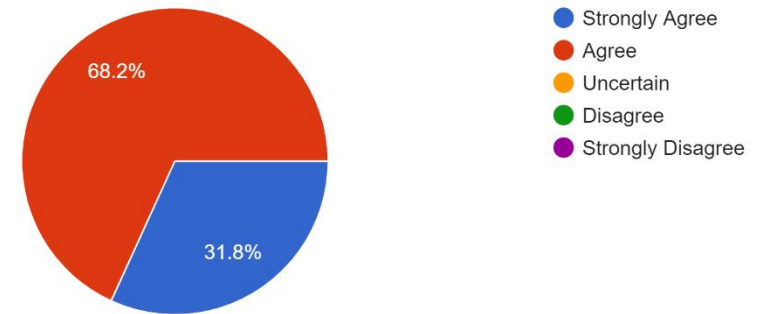
Workload was manageable

22 responses



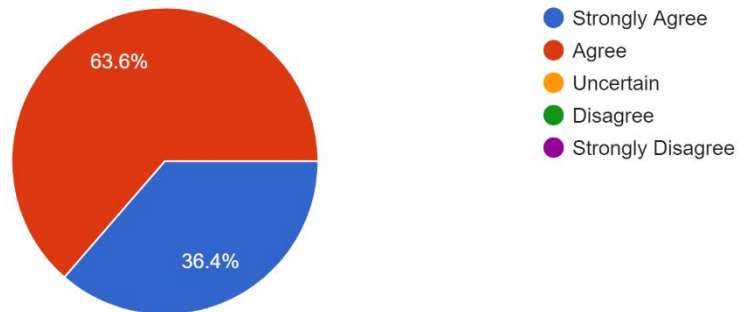
Lectures were conducted appropriately

22 responses



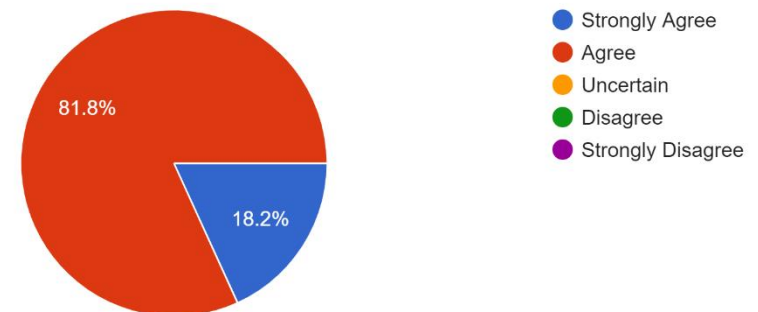
Practicals were conducted appropriately

22 responses



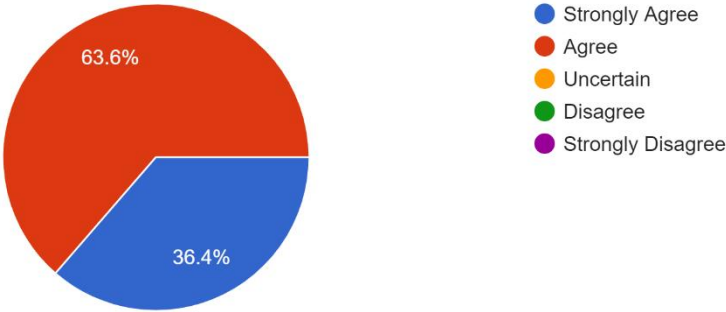
Small Group Discussion (including PBLs) were conducted appropriately

22 responses



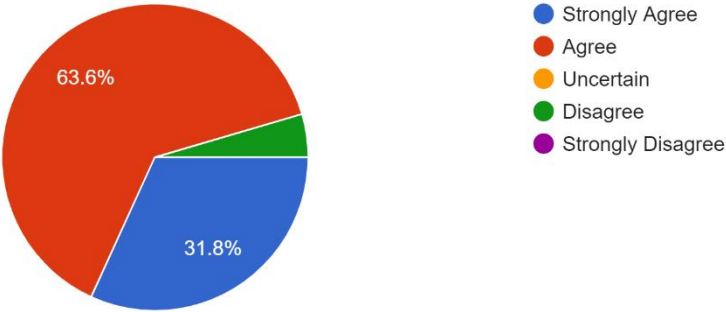
LMS & clinical evaluation were conducted regularly

22 responses



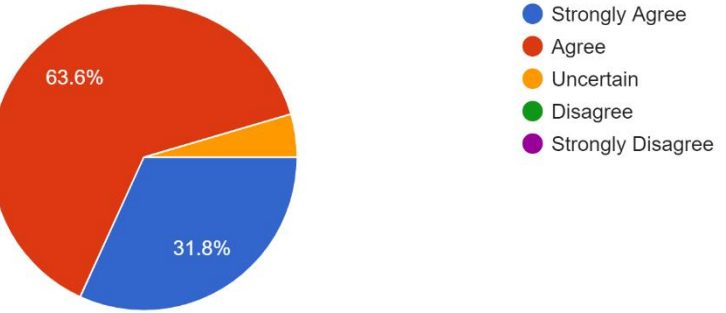
Module / Block exam was conducted as per schedule

22 responses



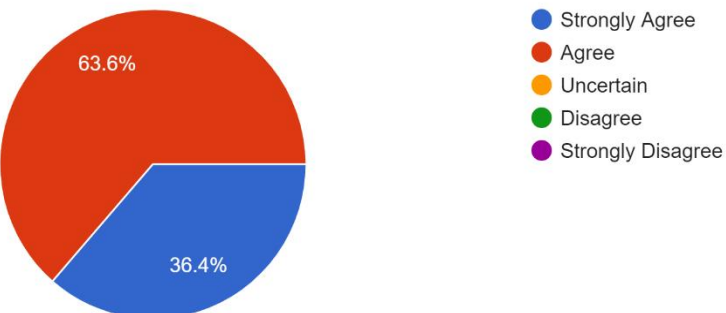
Written assessment was as per Table of Specifications

22 responses



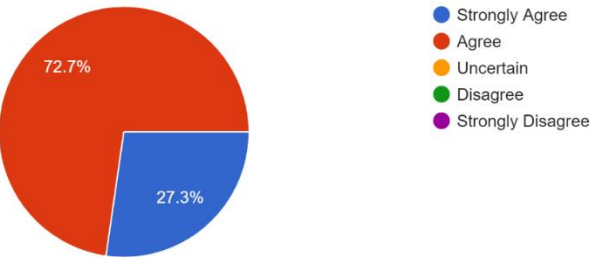
Practical assessment was as per Table of Specifications

22 responses



The TOS was well understood and conveyed to all faculty timely

22 responses



Swot Analysis of Curriculum

SOWT Analysis of Implementation of IMC

- **Strength**

- 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**

- 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
- We can further refine our integrated curriculum of 1st and 2nd year MBBS in coming years and can better tackle its flaws.
- Proper committees for feedback and evaluation are developed with collaboration from QEC& DME.

- **Weaknesses**

- A change in system is always difficult to be accepted by stakeholders
- 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**

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

Summary of Implementation Challenges of IMC

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 among the classes (each class of MBBS 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	As per PMC criteria Training of teachers the issue of anatomy excessive course.
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 improve & implement the changes.	Feedback taken at the end of each module from students
Assessment strategy:	
It is mandatory to pass in the individually rather than collectively.	subjects

- **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, Second 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 Second 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, RMU appreciate the untiring efforts of DME in this regard. DME team has worked day and night for the implementation of the integrated modular curriculum.

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 encouraged 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 Second and second year MBBS, as the attendance 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