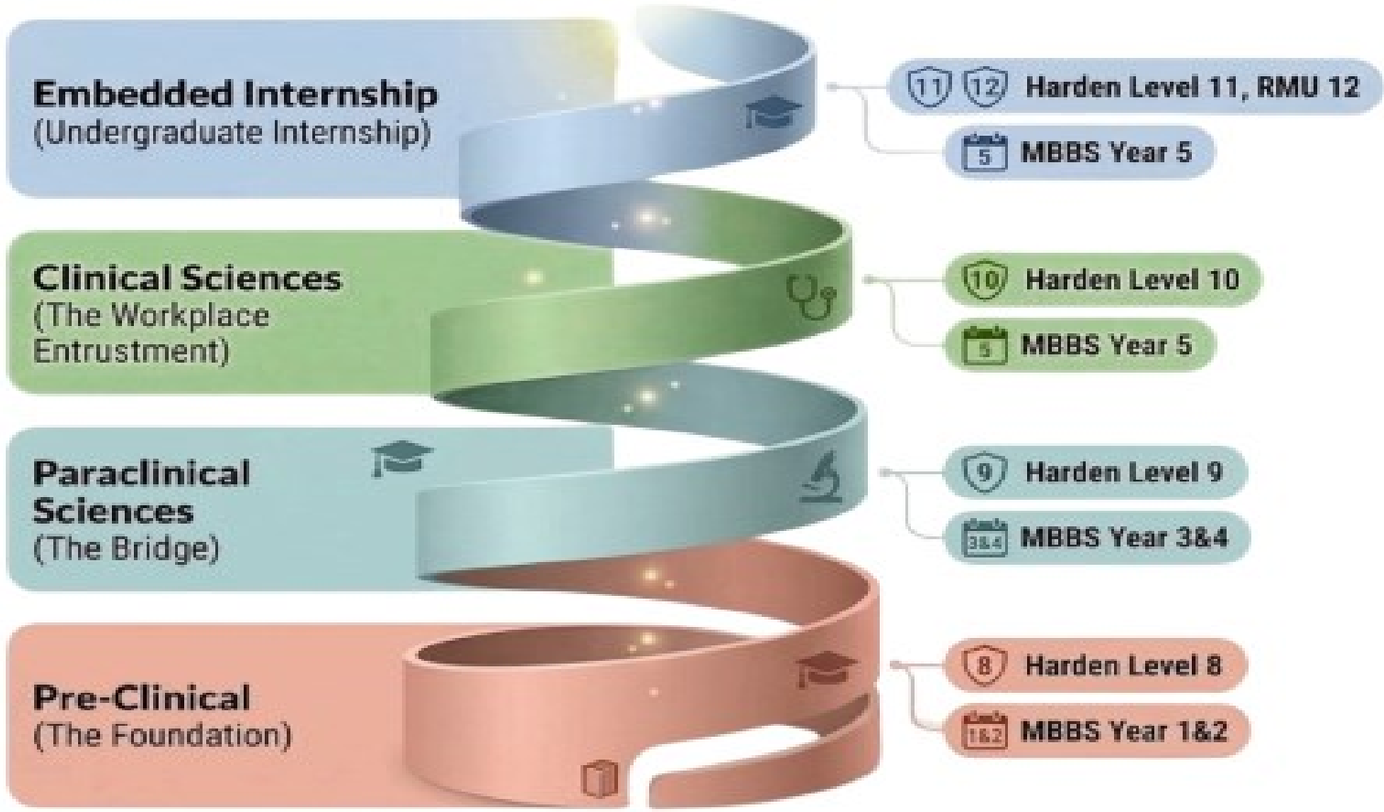
SECOND YEAR MBBS

RMU-12

Integrated Modular Curriculum-2026

Isolation to Beyond Boundaries





Department of Medical Education



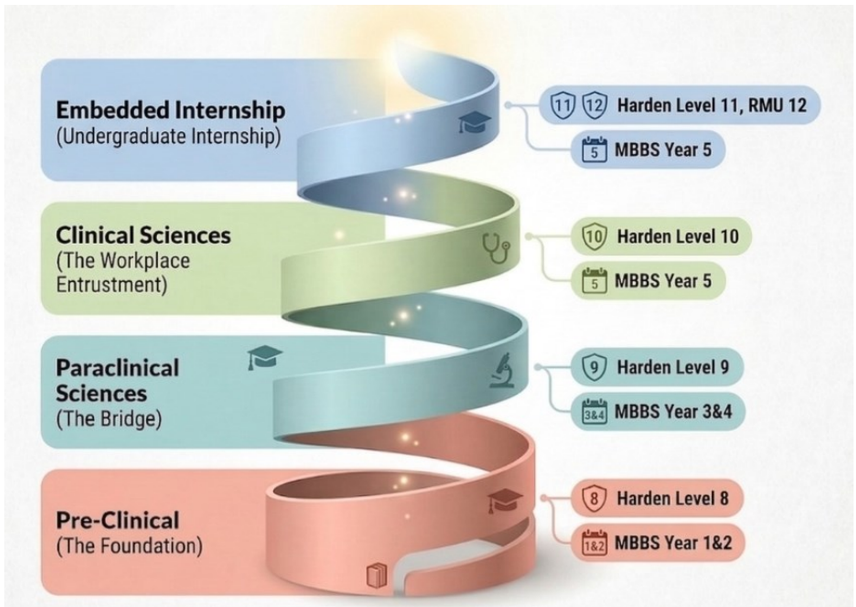
Dedicated to Hazrat Muhammad (S.A.W)

RMU – 12

Integrated Modular MBBS Curriculum 2026

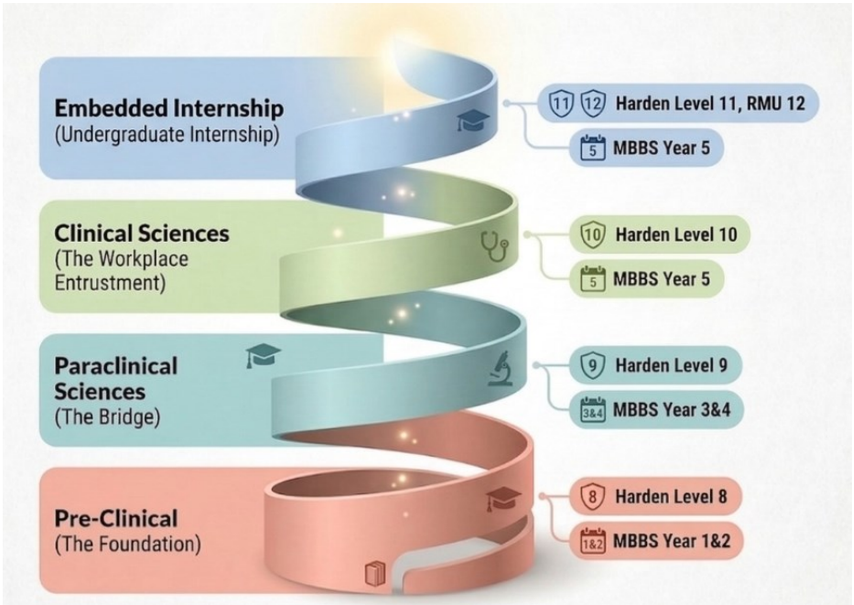
Isolation to Beyond Boundaries

2nd Year MBBS

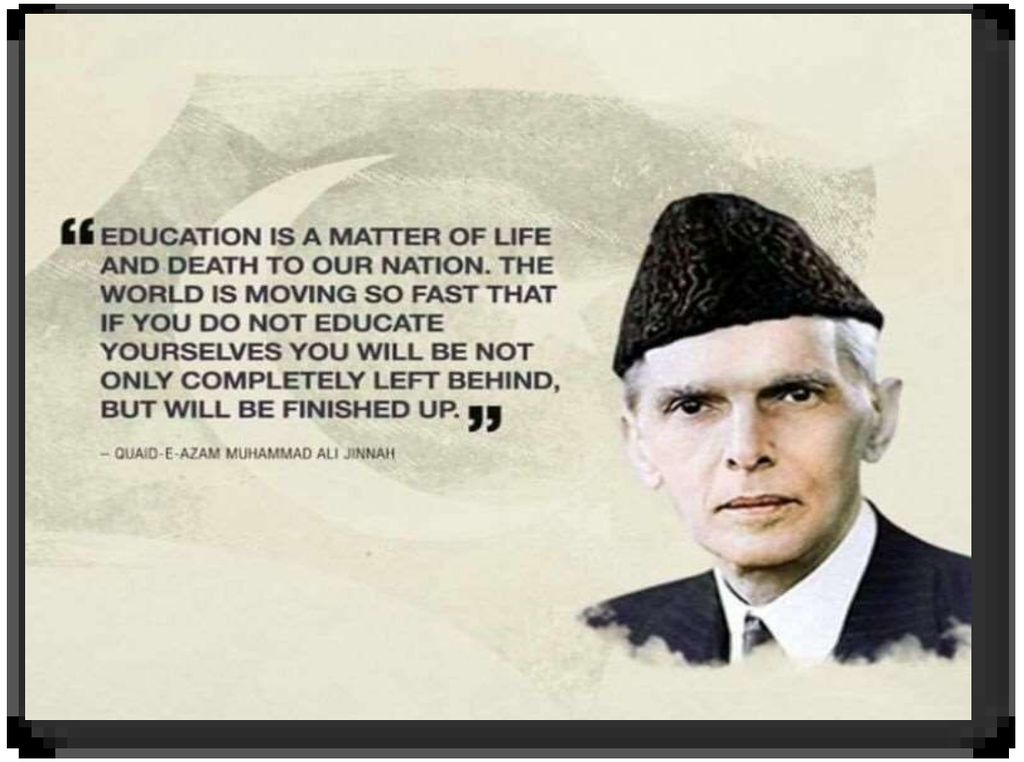


Revised January 2026

SECTION – I


Embedded Internship
(Undergraduate Internship)
Harden Level 11, RMU 12
MBBS Year 5
Clinical Sciences
(The Workplace
Entrustment)
Harden Level 10
MBBS Year 5
Paraclinical
Sciences
(The Bridge)
Harden Level 9
MBBS Year 3&4
Pre-Clinical
(The Foundation)
Harden Level 8
MBBS Year 1&2

Quote by Quaid-e-Azam Muhammad Ali Jinnah





Sardar Saleem Haider Khan

Governor Punjab

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

The integrated curriculum represents a significant shift in how medical education is delivered, focusing on the interconnection between various disciplines and emphasizing patient-centered care. By blending theoretical knowledge with practical application from the early stages of their education, students are better prepared to understand the complexities of human health and the diverse challenges they will face in their medical careers. This holistic approach is criticalin nurturing well-rounded professionals who are not only adept clinicians but alsocompassionate 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 andcompetence. I am confident that this initiative will greatly contribute to the advancement of healthcare in Punjab and beyond, ensuring that our doctors are not only skilled but also compassionate and ethical leaders in their field.



Mr. Khawaja Salman Rafique

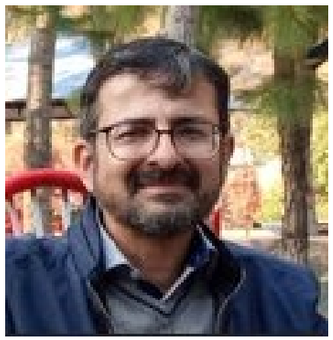
Minister, Specialized Healthcare & Medical Education Department

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

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



Prof. Dr. Muhammad Umar
Vice Chancellor RMU



Prof. Dr. Muhammad Khurram
Principal RMC

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

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

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



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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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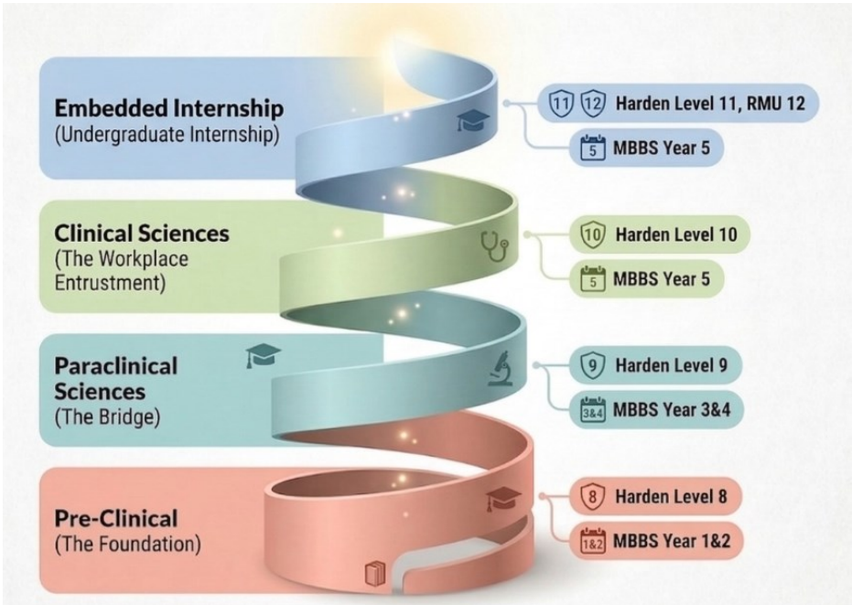
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Prof Naeem Akhtar, Dr Ifra Saeed, Dr. Ayesha Yousaf, Dr Sidra Hamid, & Dr Tehmina Qamar	2017 - 2018	1st	Developed for First Year MBBS. Composed of Horizontally and Vertically Integrated Modular Curriculum.
Dr Tehzeeb, Dr Samia Sarwar, Dr Ifra Saeed, Dr. Ayesha Yousaf, Dr Tehmina Qamar, & Dr Sidra Hamid	2019-2020	2nd	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated
Dr Tehzeeb, Dr Samia Sarwar, , Dr Ifra Saeed, Dr Ayesha Yousaf , Dr Tehmina Qamar, & Dr Sidra Hamid	2021 - 2022	3rd	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum incorporated
Dr Tehzeeb, Dr Samia Sarwar, Dr Ifra Saeed, Dr Ayesha Yousaf, Dr Tehmina Qamar, & Dr Sidra Hamid	2022 - 2023	4th	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research, Bioethics, Family Medicine curriculum incorporated along with Professionalism
Dr Samia Sarwar, Dr Ifra Saeed, Dr Ayesha Yousaf, Dr Aneela, & Dr Sidra Hamid	2023 - 2024	5th	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum revamped Bioethics, Family Medicine curriculum incorporated along with Professionalism. Entrepreneurship curriculum incorporated
Dr Samia Sarwar, Dr Ifra Saeed, Dr Ayesha Yousaf, Dr Aneela, Dr. Arsalan Manzoor & Dr Farzana Fatima	2024 - 2025	6th	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum revamped Bioethics, Family Medicine curriculum incorporated along with Professionalism. Entrepreneurship, Leadership, ITC, Artificial Intelligence, Video Graphy, Expository Writing, Social in Medicine curriculum incorporated
Dr Samia Sarwar, Dr Ifra Saeed, Dr Ayesha Yousaf, Dr Aneela, Dr. Arsalan Manzoor & Dr Farzana Fatima	2025-2026	7th	Theme based curriculum developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum revamped Bioethics, Family Medicine curriculum incorporated along with Professionalism. Entrepreneurship, Leadership, ITC, Artificial Intelligence, Video Graphy, Expository Writing, Social in Medicine curriculum incorporated

Table of Content

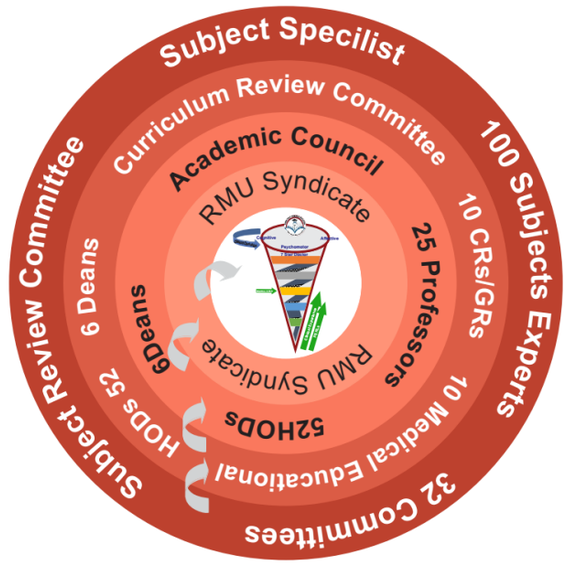


Section	Content	Page No.
Section – I	Quote by Quaid-e-Azam Muhammad Ali Jinnah	5
	Governor Punjab	6
	Minister, Specialized Healthcare & Medical Education Department	7
	Vice Chancellor RMU	8
	Principal RMC	8
	Director DME / Dean Basic Sciences	9
	Additional Assessment Director DME	9
	Assistant Director DME	9
	Curriculum Leads	18
	Members of Syndicate	19
	Deans of Faculties & Professors	20
	List of Contributors	21
Section – II	Preamble **RMU – 12** Integrated Modular MBBS Curriculum 2026 Isolation to **Beyond Boundaries**	25
	Foreword to Curriculum 2026	51
Section – III	Competency Framework • Undergraduate Competency Model • Outcomes of the Curriculum	62
	Structured Framework	72
	Academic Calendar	75
Section – IV	Teaching Strategies	77
	List of Abberiviations	89
Section – V	Block-IV • Gastrointestinal Tract Module-I • Renal Module-I	92
	Gastrointestinal Tract Module-I	93
	Renal Module-I	180
Section – VI	Block-V	239

Curriculum 2026

	• Reproduction Module-I • Central Nerves System Module-I	
	Reproduction Module-I	240
	Central Nerves System Module-I	296
Section – VII	Block-VI • Special Senses Module-I • Endocrinology Module-I	361
	Special Senses Module-I	362
	Endocrinology Module-I	409
Section – VIII	General Education Module (GEC)	454
Section – IX	Early Clinical Exposure (ECE)	460
Section – X	Learning Resources	504
Section – XI	Assessment	507
Section – XII	Feedback & Evaluation	556
Annexure – I	Study Guides	569
Annexure – II	Spiral Curriculums	573
Annexure – III	Log Books	583

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Assistant Prof. Dr. Afifa Kulsoom	Dr. Saira Aijaz S.W.D	Assistant Prof. Dr. Filza Ali
Assistant Prof M. Imran Younas	Dr. Minahil Haq Demo	Dr. Shahida Bashir APWMO
Assistant Prof. Gul Mehar Javaid	Dr. Urooj Shah DEMO	DR. Gulzaib Pervaiz APWMO
Assistant Prof. Dr. Farrah Pervaiz	Dr. Zeneara Saqib DEMO	Dr. Naila Batool APWMO
Assistant Prof. Dr. Mehwish Riaz	**Department of Medical Education**	Dr. Syeda Fatima
Dr. Farhan Hassan S.D	Prof. Dr. Ifra Saeed (Director DME)	Dr. Shahrukh Khan S.D

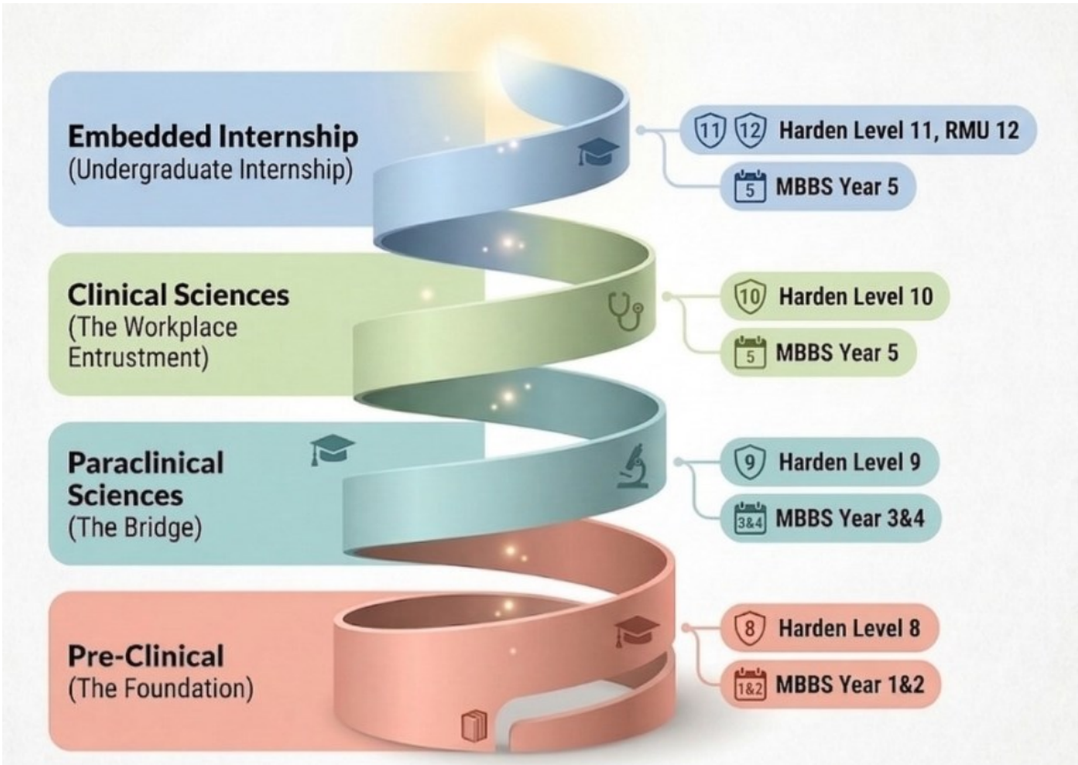
Dr. Abdul Qudoos S.D	Asso. Dr. Arsalan Manzoor Mughal (Additional Director of Assessments)	Dr. Urooj Shah DEMO
Dr. Asif Maqbool Butt Demo	Dr. Farzana Fatima (Assistant Director DME OTB)	Dr. Roohina Saeed
Dr. Imrana Saeed S.D	Dr. Omaima Asif (Assistant Director DME NTB)	**Department of Critical Care**
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Dr. Moniba Iqbal PGT	Dr Saira Aijaz Demonstrator	**Department of Family Medicine**
Dr. Bushra Farooq PGR		Assistant Prof. Dr. Sadia Azam Khan
Dr. Zaira Azhar PGR		**Department of Neurology**
Dr. Saba Maryam PGR		Assistant Prof. Dr. Waqas Ahmed
Dr. Ayesha zujaja PGR		**Department of Pulmonology**
Dr. Maria Jabeen PGR		Assistant Prof. Dr. Zaid Umar
Dr. Mehreen Noor PGR		

SECTION – II
Preamble

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



Medical education is undergoing a fundamental transformation globally, shifting from discipline-based, fragmented teaching toward integrated, competency-based, and clinically oriented learning systems that prepare graduates for real-world healthcare practice. In response to these evolving educational paradigms, national regulatory expectations, and the healthcare needs of society, Rawalpindi Medical University has adopted Clinically Oriented Integrated Modular RMU 12 MBBS Curriculum the envisioned under the guiding philosophy of "Isolation to Beyond Boundaries.". This curriculum represents a structured, longitudinal, and outcome-driven educational continuum, progressing from foundational sciences to advanced clinical practice with a fully embedded internship. It is designed to ensure the gradual and coherent development of knowledge, clinical skills, professional attitudes, and Entrustable Professional Activities (EPAs), enabling graduates to emerge as practice-ready, safe, and competent medical professionals.

The Clinically Oriented Integrated Modular Curriculum transcends traditional disciplinary silos by promoting horizontal and vertical integration across basic, para-clinical, and clinical sciences. Learning experiences are contextualized around clinical problems and patient-centered care, fostering early clinical exposure, spiral learning, and progressive responsibility. This approach aligns with contemporary integration models, workplace-based assessment strategies, and competency-based medical education principles.

Anchored in national standards and international best practices, the curriculum ensures alignment with PM&DC, WFME and HEC requirements, while addressing local healthcare priorities. By embedding internship within the undergraduate framework and mapping outcomes to clearly defined competencies and Entrustable professional activities (EPAs), the curriculum ensures continuity, accountability, and seamless transition from undergraduate training to independent clinical practice.

Through this clinically oriented and integrated approach, Rawalpindi Medical University aims to produce graduates who are not only clinically proficient but also ethical, reflective, socially accountable, and equipped for lifelong learning moving decisively from isolated learning to integrated, boundary-transcending medical education.

RMU – 12 Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

Competency Framework

Competency

PMDC



Figure 1

References

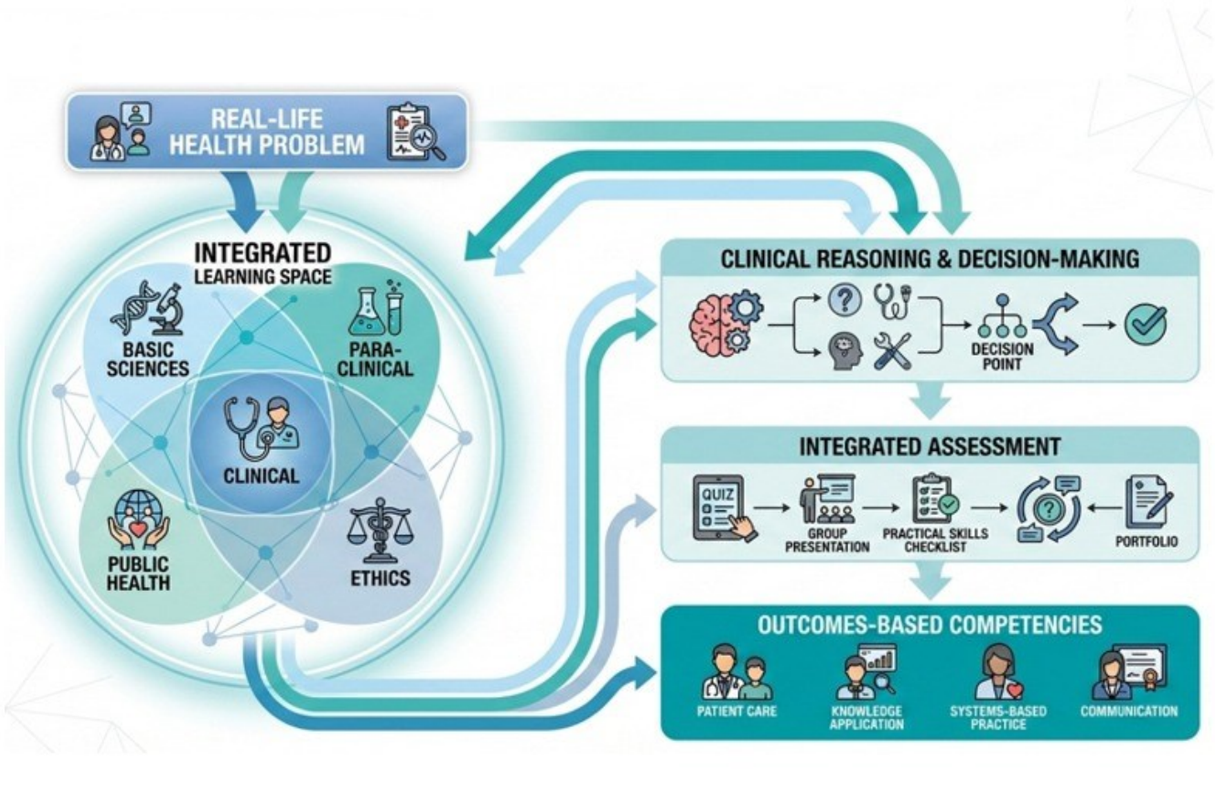
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Ten Cate O. Nuts and bolts of entrustable professional activities. Journal of graduate medical education. 2013 Mar 1;5(1):157-8.

Pakistan Medical & Dental Council Guidelines for Undergraduate Medical Education (MBBS) Curriculum – 2024

RMU – 12 Structured Framework of Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries





Foundation

- Pre-clinical sciences
- Harden Level 8 (Complementary)
  MBBS Year (1 & 2)

The Bridge

- Para-clinical sciences
- Harden Level 9,10 (Multidisciplinary & Interdisciplinary)
  MBBS Year (3 & 4)

The Workplace Entrustment

Embeded Internship

- Clinical sciences
- Harden Level 11 (Transdisciplinary)
  MBBS Year 5

Figure 2

RMU – 12 Structured Framework of Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

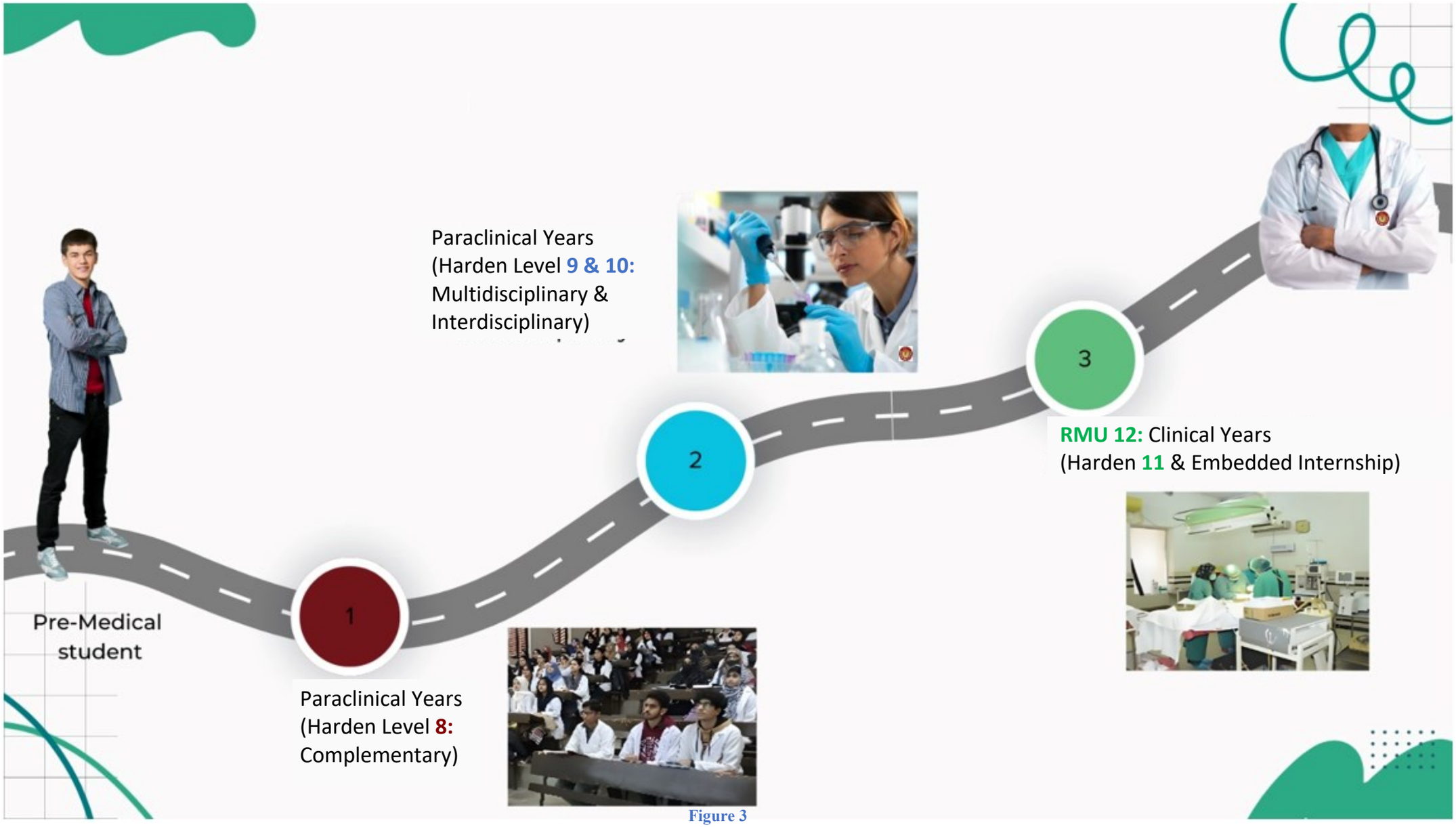


Figure 3

RMU – 12 Assessment Framework of Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

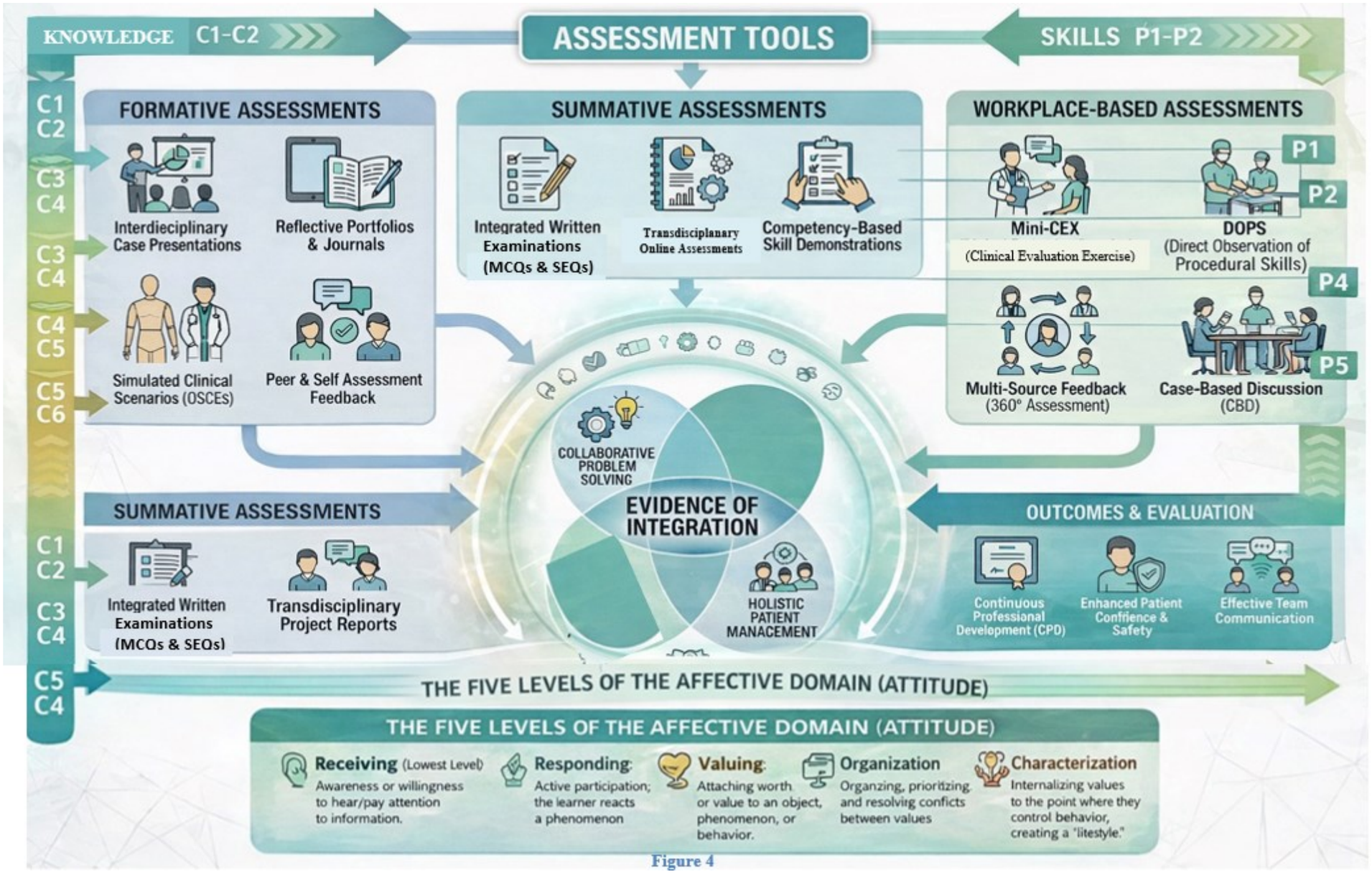


Figure 4

RMU – 12 Structured Framework of Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

RMU 12 — Harden Level 11 — Harden Level 10 — Harden Level 9 — Harden Level 8

Phase	Curricular Highlights
Pre House-job Internship	**Undergraduate Internship** The Pre House-Job Internship is a structured, supervised transition phase that consolidates clinical skills and professional readiness before the statutory house job. Learning is workplace-based and centred on clearly defined Entrustable Professional Activities aligned with international standards. Assessment relies on programmatic workplace-based tools and entrustment decisions to ensure safe, consistent performance and smoother transition into supervised clinical practice.
Clinical Sciences The Workplace Entrustment	**Transdisciplinary** Clinical education is embedded within real patient care and organised around EPAs and graded responsibility. Students learn as supervised members of clinical teams. Assessment is workplace-based and progression is guided by entrustment decisions supported by portfolios.
Paraclinical Sciences The Bridge	**Multidisciplinary and Interdisciplinary** Pre-clinical sciences are organised around clinical problems and system themes with interdisciplinary learning outcomes and team-based teaching. Instruction uses case-based learning, simulation and integrated laboratories to promote cross-disciplinary reasoning, while advanced units introduce task-based competencies and EPAs using a spiral design. Assessment emphasises integrated performance through OSCEs, workplace-linked tools and portfolios, with progression informed by aggregated evidence rather than single examinations.
Pre-Clinical The Foundation	**Complementary** Basic Medical Sciences are organized into system and theme-based modules with coordinated teaching across disciplines. Subject teaching is aligned through module-level outcomes and planned integrated sessions that reinforce related concepts. Assessments include items to test applied understanding, supported by interdisciplinary planning to ensure coherence.

MBBS Year 5 — MBBS Year 3&4 — MBBS Year 1&2

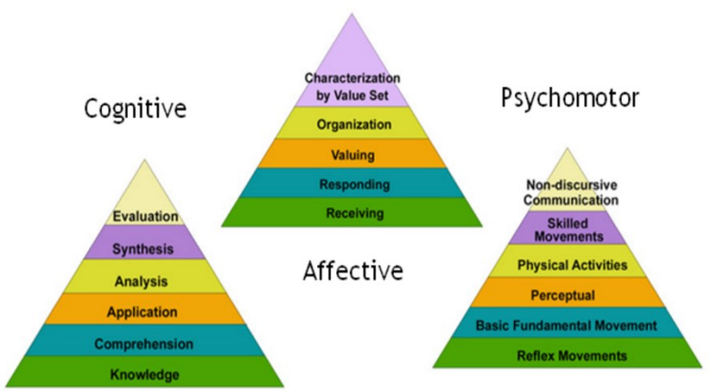
Rawalpindi Medical University has adopted a staged curricular framework that reflects a progressive movement along Harden's integration ladder, culminating in going beyond the ladder to **RMU 12**. The curriculum is designed to ensure that knowledge acquired in the early years is not isolated or terminal, but is progressively contextualized, applied and transformed into professional competence. This progression is achieved by aligning curricular structure, teaching approaches and assessment strategies so that students move from conceptual understanding to integrated reasoning and finally to authentic clinical performance with graded responsibility.

Phase 1- The Foundation

In the early phase, basic sciences are organised using a complementary approach. The curriculum is structured into system- and theme-based modules rather than isolated subject courses, allowing Anatomy, Physiology, Biochemistry and related disciplines to retain their academic identity while contributing in a coordinated and mutually reinforcing manner. Learning outcomes are written at the module level and are intentionally framed to reflect conceptual understanding of systems rather than discipline-specific factual recall alone. Teaching is primarily discipline-led, but content delivery is carefully sequenced so that related concepts across subjects are taught in close temporal proximity. This sequencing is reinforced through planned integrated multidisciplinary activities such as problem-based learning, case-based learning and **clinico concept connect sessions** that require students to draw connections across disciplines. Teaching methods extend beyond lectures to include small-group discussions with structured clinical problem triggers that encourage early application of knowledge. Assessment in this phase is knowledge-focused, but incorporates integrated items and short clinical vignettes to test applied understanding **(C4 level)** across disciplines. These integrated assessment elements are deliberately introduced to prepare students for more complex synthesis **(C6 level)** in later phases, while maintaining the reliability. Regular interdisciplinary planning meetings and module coordination ensure coherence, avoid unnecessary duplication and maintain alignment between teaching and assessment.

Phase 2- The Bridge

As students enter the pre-clinical phase, the curriculum transitions into a multidisciplinary and subsequently interdisciplinary design. At this stage, curricular organisation shifts more clearly towards clinical systems and patient presentations, and learning outcomes emphasise the integration of knowledge, skills and reasoning across disciplines. Rather than subjects contributing independently, departments collaborate in the design and delivery of modules, and students encounter learning experiences that require simultaneous application of concepts from multiple domains. Teaching is increasingly delivered through team-based and co-facilitated sessions, with clinicians and basic scientists jointly guiding learning activities. Case-based learning, integrated practical sessions and simulation-based teaching become central modalities, allowing students to engage with clinically meaningful problems while still grounded in scientific principles.



Blooms Taxonomy

The curriculum adopts a spiral structure in which key concepts are revisited at increasing levels of complexity, enabling deeper understanding and clinical relevance. In advanced pre-clinical components, the curriculum becomes explicitly task-oriented, focusing on common clinical presentations and professional activities rather than disciplinary content. At this stage, portfolios are introduced to support longitudinal documentation of learning, and early forms of workplace-linked assessment and entrustable activities are incorporated to familiarise students with performance-based expectations. Assessment strategies emphasise synthesis and reasoning, using integrated written examinations, complex case vignettes, OSCEs and structured simulation assessments. Decisions about student progress increasingly rely on aggregated evidence from multiple assessment tools and research projects.

Phase 3- The Workplace Entrustment

In the clinical phase, the curriculum becomes fully transdisciplinary, with learning embedded within authentic patient care and professional practice. Educational activities are organised around real clinical tasks, patient care pathways and **Entrustable Professional Activities** that reflect the core responsibilities of a graduating doctor. Students are integrated into clinical teams and participate in patient care under supervision, progressively assuming greater responsibility as competence is demonstrated. Teaching is predominantly workplace-based, supported by bedside teaching, coaching, reflective practice and targeted simulation for complex or high-risk activities. The distinction between disciplines becomes secondary to the holistic management of patients, as students are expected to integrate biomedical knowledge, clinical skills, communication, professionalism and teamwork in real settings. Assessment is programmatic and centred on performance in the workplace, using tools such as mini-CEX, DOPS, case-based discussions and multisource feedback. Evidence from these assessments is collected longitudinally within portfolios and reviewed by entrustment or competence committees to make informed decisions about progression and readiness for practice. Summative judgment is therefore based on sustained performance over time. Faculty roles evolve from subject teachers to supervisors, assessors and coaches, with explicit responsibility for observation, feedback and entrustment decisions. Diverse clinical exposure in tertiary public sector hospitals and community settings ensure adequate exposure, supervision and assessment opportunities, while quality assurance processes focus on the validity and consistency of entrustment decisions and learning experiences.



Miller's Pyramid of Clinical Competence

Phase 4- The Undergraduate Internship

The Undergraduate Internship is a structured, supervised transition phase designed to consolidate clinical competence and ensure readiness for the statutory house job. It provides learners with protected, workplace-based exposure focused on authentic patient care tasks, guided by clearly defined Entrustable Professional Activities aligned with international standards. Teaching emphasises supervised clinical practice, simulation for high-risk scenarios, and interprofessional teamwork, while assessment uses programmatic

workplace-based tools, portfolios and entrustment decisions to judge safe, consistent performance. This level strengthens patient safety, reduces transition shock, and ensures that graduates enter the house job with demonstrable, documented readiness for independent supervised practice.

Across all phases, the curriculum is underpinned by faculty development and continuous quality assurance. The staged movement from complementary through multidisciplinary and interdisciplinary learning to transdisciplinary clinical practice ensures that graduates are not only knowledgeable, but also capable of applying their learning effectively and safely in real clinical environments. This integrated and progressive design reflects contemporary best practices in medical education and aligns the educational experience with the expectations of modern healthcare systems.

Key Highlights

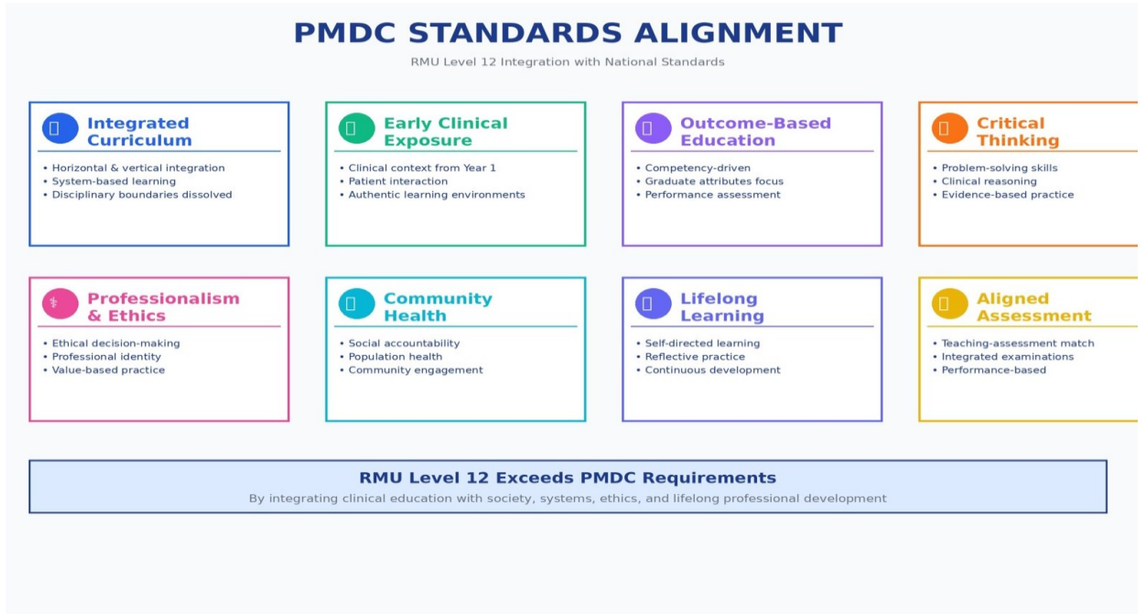
- Transcends Harden's Level 11 through integration with society, systems, ethics, and lifelong learning
- Fully aligned with PMDC undergraduate medical education standards
- Emphasizes higher-order thinking: Analysis, Evaluation, and Creation (Bloom's Taxonomy)
- Produces socially accountable, adaptive physicians prepared for 21st-century healthcare challenges

1. Foundations of Integration

1.1 PMDC Standards for Medical Education

The Pakistan Medical and Dental Council mandates a transformative approach to undergraduate medical education characterized by:

- **Integrated Curriculum:** Horizontal integration (across disciplines) and vertical integration (across years)
- **Early Clinical Relevance:** Clinical context introduced from initial years
- **Outcome-Based Education:** Focus on graduate competencies rather than content coverage
- **Critical Thinking & Problem-Solving:** Development of analytical and evaluative skills
- **Professionalism & Ethics:** Embedded throughout the curriculum, not as isolated modules
- **Alignment of Teaching, Learning, and Assessment:** Constructive alignment with graduate outcomes



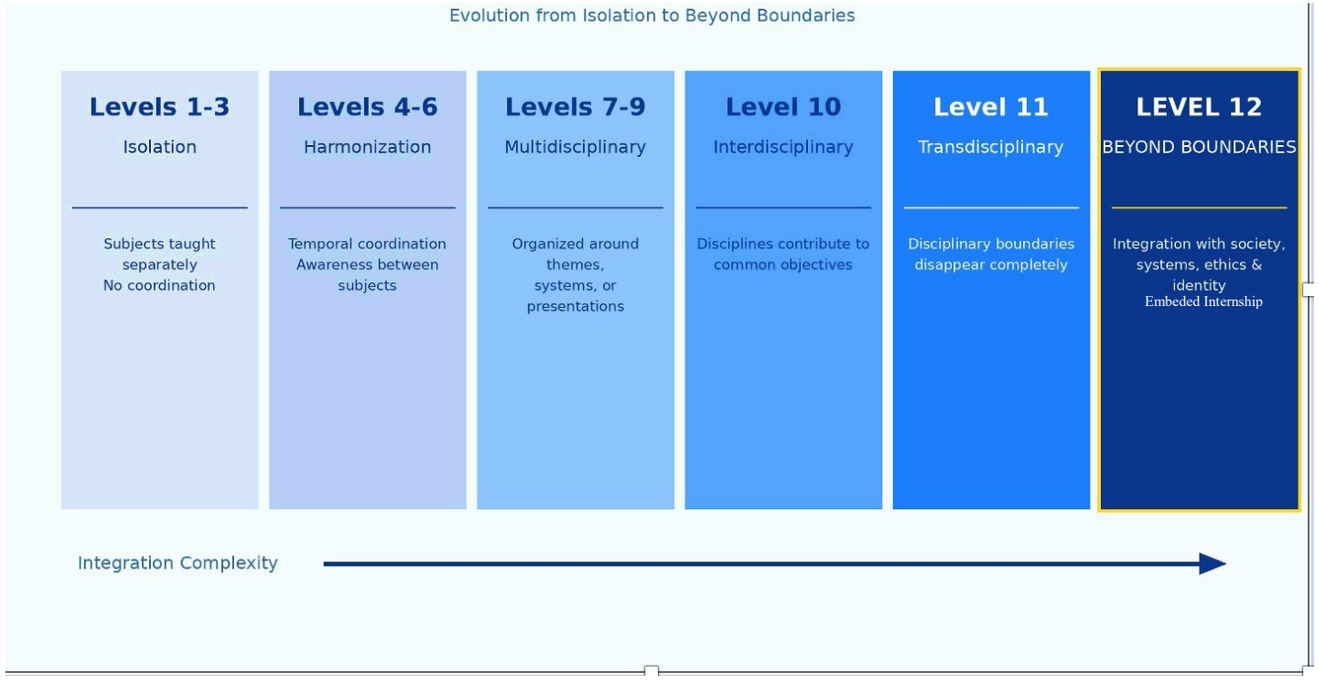
1.2 Harden's Integration Ladder: Overview

Harden's Integration Ladder provides a systematic framework for evaluating curricular integration, progressing through 11 levels:

Harden's Integration Ladder

RMU

RMU – 12 Beyond Boundaries



2. RMU 12 – Isolation to Beyond Boundaries

2.1 Conceptual Definition

RMU Level 12: Beyond Boundaries Integration

A curriculum in which learning is organized not merely around disciplines or clinical problems, but around real-world health systems, societal needs, ethical complexity, population health challenges, and professional identity formation producing graduates who can adapt, lead, and innovate across contexts.

2.2 Why Level 12 Exists

While Harden's Integration Ladder culminates at Level 11 (Transdisciplinary Integration), contemporary medical education—particularly as mandated by PMDC—requires graduates who can function beyond the clinical encounter. RMU operates beyond transdisciplinary clinical integration by:

- Shifting the unit of integration from the patient alone to the patient embedded within society, systems, ethics, and professional identity
- Addressing health systems, governance, and resource allocation as integral learning domains
- Embedding knowledge creation and research literacy, not just knowledge synthesis
- Structuring lifelong learning and adaptive professionalism as explicit outcomes

2.3 Five Pillars of Level 12 Integration

A. Societal Integration: Patient-in-Society Problems

Level 11: Patient-centered clinical problems

RMU Level 12: Patient-in-society problems

RMU Implementation:

- Community-based medical education

- Analysis of social determinants of health
- Preventive and promotive healthcare strategies
- Health equity considerations in clinical decision-making

Students don't merely diagnose disease they analyze population patterns and design interventions, requiring evaluation and creation (Bloom's highest levels).

B. Value-Based Integration: Contextual Ethics

Level 11: Ethics integrated within cases

RMU Level 12: Ethics embedded longitudinally in real decisions

RMU Implementation:

- Ethical dilemmas arising from real patient encounters, not hypothetical scenarios
- Continuous professional identity formation throughout the curriculum
- Assessment of reflective practice and ethical reasoning

Students must weigh competing values, manage uncertainty, and justify actions—hallmarks of evaluation-level cognition.

C. System-Level Integration: Healthcare Systems & Leadership

Level 11: Focus on individual patient care

RMU Level 12: Focus on healthcare systems and governance

RMU Implementation:

- Exposure to health systems functioning and policy implications
- Understanding resource allocation realities
- Leadership and teamwork competencies



Students evaluate trade-offs between individual benefit and population good something no single discipline or clinical problem can teach.

D. Knowledge Creation: Beyond Synthesis

Level 11: Knowledge synthesis **RMU Level 12:** Knowledge generation

RMU Implementation:

- Research literacy and critical appraisal skills
- Clinical audits and community health projects
- Evidence-based practice and innovation

Students formulate research questions, design solutions, and create outputs—aligning with the creation level of Bloom's Taxonomy.

E. Temporal Integration: Lifelong Professional Identity

Level 11: Competent graduate **RMU Level 12:** Adaptive professional

RMU Implementation:

- Reflective portfolios documenting professional growth
- Self-directed learning plans
- Feedback-driven continuous improvement

Graduates leave with the ability to identify learning needs and adapt to new contexts—temporal integration across undergraduate education and professional life.



3. Alignment with PMDC Standards

PMDC Competency	RMU Implementation	Level 12 Justification
Medical Knowledge	Integrated system-based modules combining anatomy, physiology, pathology, pharmacology, radiology, and clinical medicine	Knowledge constructed through real patient problems; subject boundaries dissolved
Clinical Skills & Patient Care	Early clinical exposure, bedside teaching, skills labs, OSCEs	Skills and knowledge learned simultaneously in authentic clinical contexts
Clinical Reasoning	Case-based learning, problem-based tutorials, integrated examinations	Learning organized around clinical problems requiring synthesis beyond single disciplines
Communication Skills	Longitudinal communication training embedded in OSCEs and ward teaching	Communication competencies embedded within patient encounters, not isolated modules
Professionalism & Ethics	Longitudinal professionalism themes, ethics discussions during clinical rotations	**Ethical reasoning contextualized within patient care—extends to value-based integration**
Community & Preventive Health	Community-based medical education, public health projects, outreach programs	**Integrates clinical medicine with population health and social determinants— societal integration**
Lifelong Learning	Reflective practice, research literacy, self-directed learning tasks	**Students identify learning needs from clinical encounters—temporal integration**

The following table demonstrates explicit mapping between PMDC graduate competencies, RMU curriculum implementation, and justification for Level 12 integration:

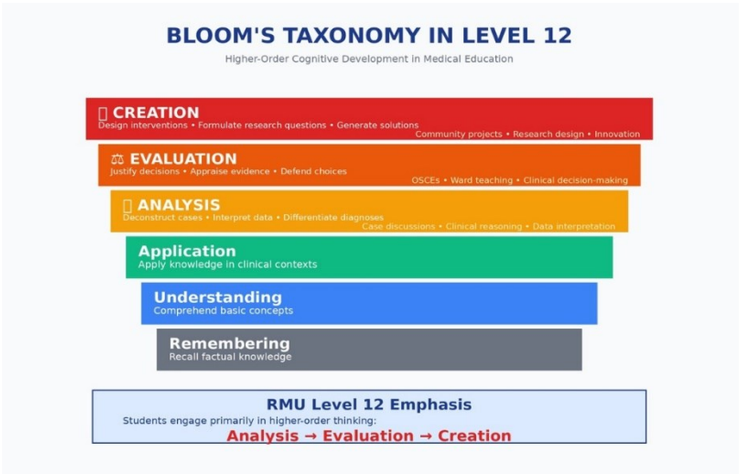
4. Bloom's Taxonomy & Higher-Order Thinking

RMU's curriculum explicitly targets higher-order cognitive domains of Bloom's Taxonomy:

- **Analysis:** Breaking down complex clinical cases, interpreting investigations, differentiating diagnoses
- **Evaluation:** Appraising evidence, justifying management decisions, defending clinical choices
- **Creation:** Designing interventions, formulating research questions, developing solution

4.1 Learning Activities Mapped to Bloom's Levels

Learning Activity	Bloom's Level	Justification
Integrated case-based discussions	**Analysis**	Students deconstruct complex cases, interpret investigations, differentiate diagnoses
Ward-based clinical teaching	**Analysis → Evaluation**	Learners appraise patient data and justify management decisions in real time
OSCEs and scenario-based stations	**Evaluation**	Students defend clinical decisions, prioritize care, demonstrate judgment under pressure
Community health projects	**Evaluation → Creation**	Learners assess community needs and design context-specific preventive interventions
Research projects & clinical audits	**Creation**	Students formulate questions, design studies, generate new knowledge



GRADUATE OUTCOMES

Level 12 Integration Produces Adaptive Professionals

CORE COMPETENCIES

Clinical Excellence
- Evidence-based practice
- Diagnostic reasoning
- Patient safety

Professionalism
- Ethical decision-making
- Patient-centered care
- Accountability

Communication
- Effective patient interaction
- Interprofessional collaboration
- Cultural competence

Population Health
- Community engagement
- Preventive focus
- Health promotion

ADAPTIVE CAPABILITIES

Systems Thinking
- Health systems understanding
- Policy awareness
- Resource management

Research Literacy
- Critical appraisal
- Knowledge generation
- Evidence synthesis

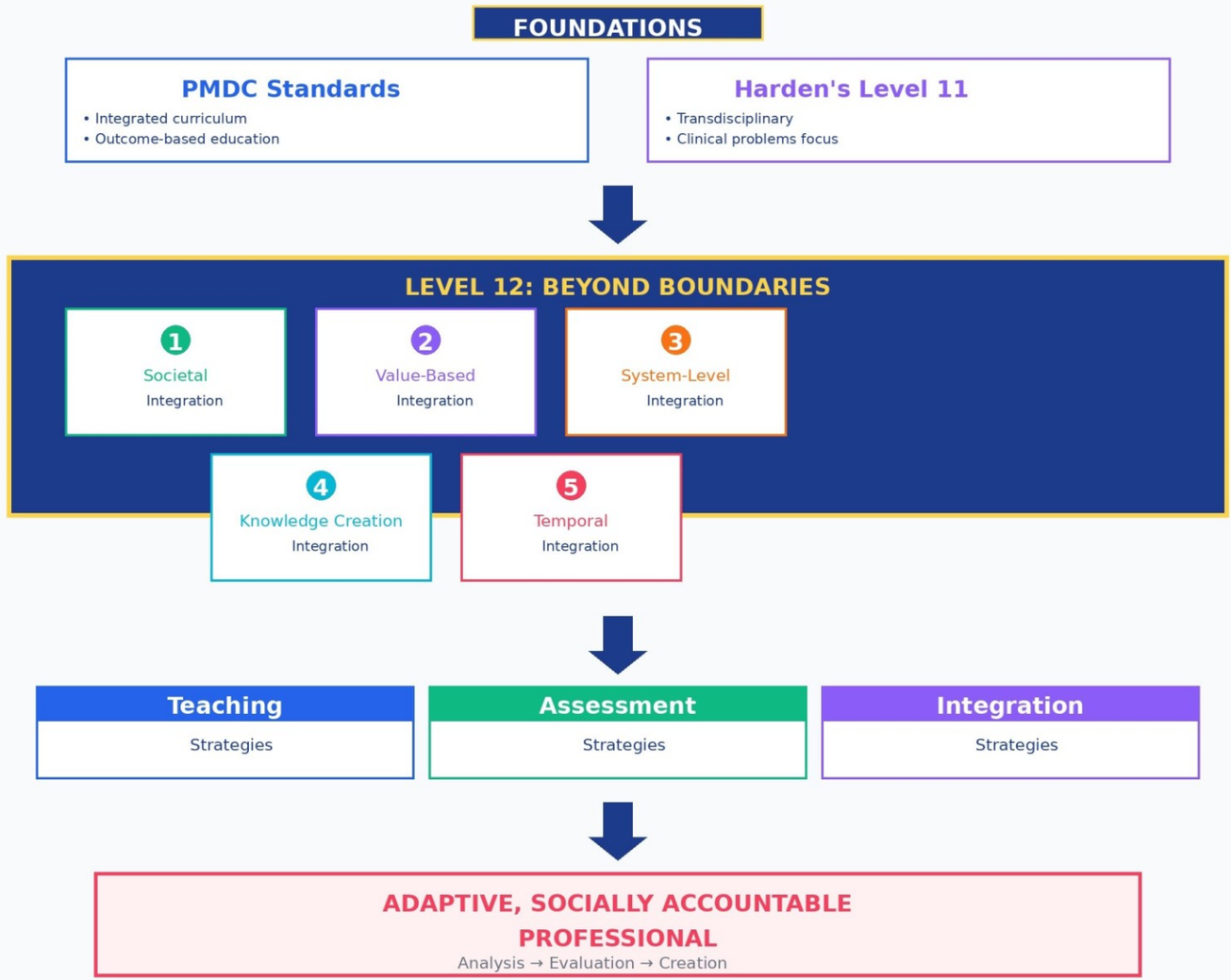
Lifelong Learning
- Self-directed growth
- Reflective practice
- Adaptive expertise

Leadership
- Innovation
- Change management
- Team development

ADAPTIVE, SOCIALLY ACCOUNTABLE PROFESSIONAL

RMU LEVEL 12 FRAMEWORK

Complete Conceptual Flow



Conclusion

Rawalpindi Medical University's curriculum exemplifies a transformational approach to medical education that extends beyond traditional disciplinary integration. By achieving **Level 12: Beyond Boundaries Integration**, RMU demonstrates that modern medical education must prepare graduates not only as competent clinicians but as adaptive, reflective, socially accountable professionals capable of navigating complex health systems, ethical dilemmas, and evolving healthcare landscapes.

This framework, fully aligned with PMDC standards and grounded in Bloom's higher-order cognitive domains, positions RMU as an innovator in outcome-based, student-centered medical education that produces physicians prepared for 21st-century healthcare challenges.

The Five Pillars of Level 12—Societal Integration, Value-Based Integration, System-Level Integration, Knowledge Creation, and Temporal Integration—collectively represent a holistic vision for medical education that transcends disciplinary boundaries and prepares graduates for lifelong professional excellence.

Key Takeaways for Educators

- Level 12 integration is achievable through deliberate curriculum design aligned with regulatory standards
- Higher-order thinking (Analysis, Evaluation, Creation) must be explicitly embedded in learning activities
- Integration extends beyond clinical problems to encompass society, systems, ethics, and professional identity
- Assessment strategies must align with transdisciplinary learning objectives
- The ultimate goal is producing adaptive professionals, not merely competent graduates

Clinico - Concept Connect Session ($C^3$6)

Introduction:

A Clinico -Concept Connect Session is a **case-based, concept-driven educational encounter** in which a carefully designed clinical scenario is used as the central anchor to explore and integrate relevant concepts from basic and clinical sciences. This **Session** is an integrated teaching–learning activity designed to bridge the gap between **foundational biomedical concepts** and their **real-world clinical application**. It serves as a structured platform where students actively connect basic science principles with clinical reasoning, patient presentation, and professional decision-making, thereby promoting deeper understanding and long-term retention of knowledge.

This session moves beyond traditional discipline-based teaching by fostering **conceptual integration**, **contextual learning**, and **early clinical exposure**, enabling students to appreciate the relevance of basic sciences in patient care from the outset of their medical training.

Rather than teaching facts in isolation, the session emphasizes:

- Understanding **why** a concept matters clinically
- Applying **core principles** to explain patient findings
- Developing **clinical reasoning skills** in a guided, safe learning environment

The focus remains on **conceptual clarity**, **clinical correlation**, and **professional competence**, rather than diagnosis-driven or management-heavy discussions.

Structure of the Clinico -Concept Connect Session

The session is structured into clearly defined phases to ensure alignment with learning outcomes and progressive student engagement:

1. Clinical Trigger (Case Introduction)

- A concise, authentic clinical scenario is presented.
- The case is selected to naturally elicit key underlying concepts.
- Information is disclosed in a focused manner to stimulate curiosity and inquiry.

2. Concept Mapping and Exploration

- Relevant foundational concepts (e.g., physiological mechanisms, biochemical pathways, structural–functional relationships) are identified.
- Students are guided to link clinical signs, symptoms, and investigations to these concepts.

C3: Clinico Concept Connect
C6: Bloom's Level C6 (Creation / Synthesis)
Learners integrate knowledge from basic, para-clinical, and clinical sciences to formulate differential diagnoses, management plans, or clinical reasoning pathways, demonstrating higher-order thinking and decision-making.
Reference: Anderson, L. W., & Krathwohl, D. R. (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives.

- Emphasis is placed on **mechanisms**, not memorization.

3. Integrated Discussion

- Faculty from relevant disciplines facilitate discussion collaboratively.
- Concepts are reinforced through clinical correlation and guided questioning.
- Students actively participate in explaining findings using scientific reasoning.

4. Application and Reflection

- Learners reflect on how conceptual understanding informs clinical thinking.
- Key take-home messages are summarized.
- Opportunities for self-directed learning and further exploration are highlighted.

Implementation Strategy

The Clinico -Concept Connect Session is implemented as a **planned, scheduled activity** within the integrated curriculum and follows these principles:

- **Faculty Collaboration:** Basic science and clinical faculty jointly design and facilitate sessions to ensure coherence and relevance.
- **Curriculum Alignment:** Each session is mapped to predefined learning outcomes, competencies, and entrustable professional activities.
- **Active Learning:** Small-group discussions, guided questioning, and concept linking are emphasized over didactic teaching.
- **Progressive Complexity:** Early sessions focus on core concepts, with increasing clinical depth as students advance.
- **Feedback and Reflection:** Structured feedback is provided to reinforce learning and improve reasoning skills.

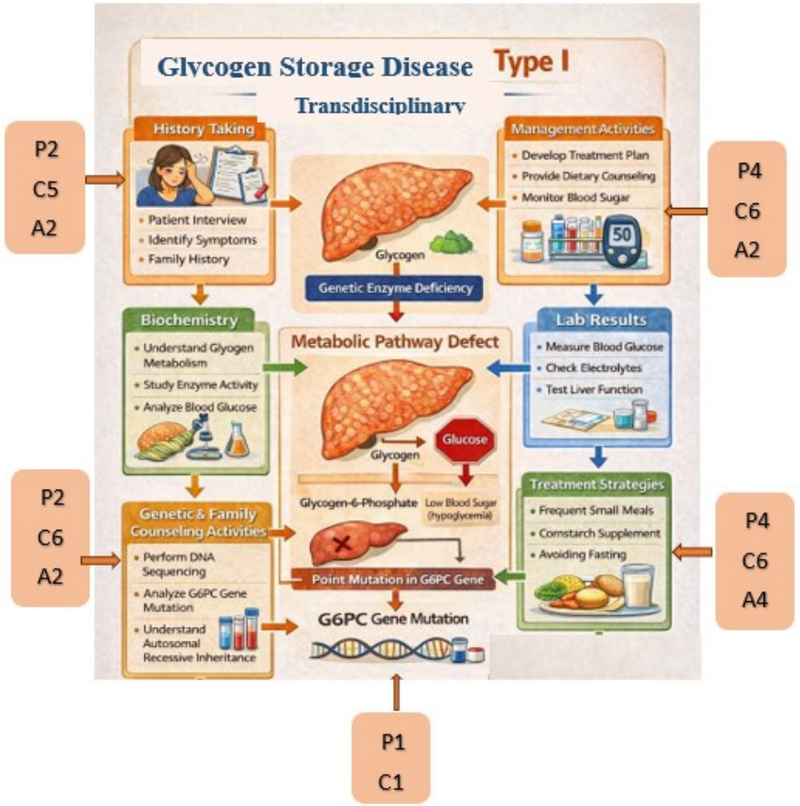
Educational Value

Through its integrated design, the Clinico -Concept Connect Session:

- Strengthens **conceptual understanding**
- Enhances **clinical reasoning and analytical skills**
- Encourages **horizontal and vertical integration**
- Promotes **student engagement and ownership of learning**
- Prepares learners to become **practice-ready, concept-driven clinicians**

Example of Clinico - Concept Connect (C³6) Session

Harden Level 11
Transdisciplinary



Theme Title from Molecules to Medicine: Clinical Applications of Molecular Biology and Genetics

Clinico -Concept Connect (C³6) Session

Clinical Case Scenario: A lady with progressive fatigue

A 22-year-old woman presents to the outpatient clinic with progressive fatigue, muscle weakness, and episodes of dizziness, particularly after prolonged fasting. She reports poor exercise tolerance and occasional nausea.

There is no history of infection or chronic illness. A sibling has a similar condition.

On examination, she appears thin but alert. Vital signs are stable. Mild proximal muscle weakness is noted.

There is no organomegaly.

Laboratory and Molecular Findings

- Fasting blood glucose: Low
- Serum electrolytes: Normal
- Enzyme activity assay: Reduced activity of a glucose-metabolizing enzyme
- Genetic analysis: Point mutation in enzyme-encoding gene
- Family screening: Similar mutation identified

This case exemplifies how a **single molecular defect** leads to systemic clinical manifestations, reinforcing the transition from molecular mechanisms to patient-centered medicine

Educational Relevance to Theme

This case allows learners to trace disease progression:

Gene mutation → Altered protein structure → Enzyme dysfunction → Metabolic failure → Clinical presentation

It reinforces:

- Gene expression and mutation

Clinico-Concept Connect (C³6) Sessions
Transdisciplinary Integration (Harden Level 11)

Domains of Learning According to Blooms Taxonomy					
Cognitive Domain: knowledge and mental skills. (C)		**Psychomotor Domain:** Motor skills. (P)		**Affective Domain:** feelings, values, dispositions, attitudes, etc (A)	
• C1	Remembering	P1	Imitation	A1	Receive
• C2	Understanding	P2	Manipulation	A2	Respond
• C3	Applying	P3	Precision	A3	Value
• C4	Analyzing	P4	Articulation	A4	Organize
• C5	Evaluating	P5	Naturalization	A5	Internalize
• C6	Creating				

- Enzyme kinetics and regulation
- Metabolic adaptation during fasting
- Familial inheritance patterns
- Role of molecular diagnostics in clinical practice

Learning Objectives

By the end of this theme, the student will be able to:

- Explain the molecular basis of gene expression, including transcription, translation, and regulation of enzymes.
- Describe the role of enzymes, cofactors, and inhibitors in normal metabolic processes and disease states.
- Correlate molecular and genetic abnormalities with common clinical conditions such as metabolic disorders, infertility, and cancer.
- Understand basic molecular mechanisms underlying inherited and acquired genetic diseases.
- Apply principles of molecular biology and genetics to interpret simple clinical and laboratory scenarios.

Appreciate the relevance of molecular medicine in diagnosis, prognosis, and therapeutic decision-making.

Integration Framework

Harden Level 9 – Multidisciplinary Integration

This C³6 session operates at **Harden Level 9**, where multiple disciplines address the *same clinical problem* in parallel, maintaining disciplinary identity while reinforcing conceptual alignment.

Disciplines Involved

- **Anatomy**
  - Liver and skeletal muscle structure involved in glucose metabolism
  - Anatomical basis of muscle weakness and exercise intolerance
- **Biochemistry**
  - Enzyme kinetics, regulation, and metabolic pathways
  - Impact of genetic mutations on enzyme activity
- **Medicine**

    - Clinical evaluation of fasting hypoglycemia
    - Diagnostic reasoning in inherited metabolic disorders
- **Surgery**
    - Peri-procedural metabolic considerations
    - Role in diagnostic evaluation where indicated

Each discipline contributes **complementary insights** without content fusion, fulfilling the criteria of multidisciplinary integration

Explicit EPA Mapping

EPA-1: Interpret Clinical and Laboratory Data

Entrustment Level: 1–2

Students interpret fasting glucose levels and enzyme assays under supervision.

EPA-2: Apply Basic Science to Clinical Reasoning

Entrustment Level: 1

Students explain how molecular mutations produce clinical disease.

EPA-3: Communicate Findings in a Structured Manner

Entrustment Level: 1–2

Students present the case during group discussions.

EPA-4: Demonstrate Professionalism and Teamwork

Entrustment Level: 1

Students engage respectfully in multidisciplinary learning.

Mapping to Harden Levels

- **Level 8 (Complementary):**

  Coordinated teaching of genetics, biochemistry, and anatomy around a shared theme
- **Level 9 (Multidisciplinary):**

  Parallel disciplinary analysis of the same clinical case

- **Level 10 (Interdisciplinary):**
  Early synthesis of molecular, biochemical, and clinical data into a unified explanation

Teaching–Learning Strategy

- Case-based discussion
- Facilitated multidisciplinary dialogue
- Guided molecular-to-clinical reasoning
- Early clinical exposure emphasis

Assessment Alignment

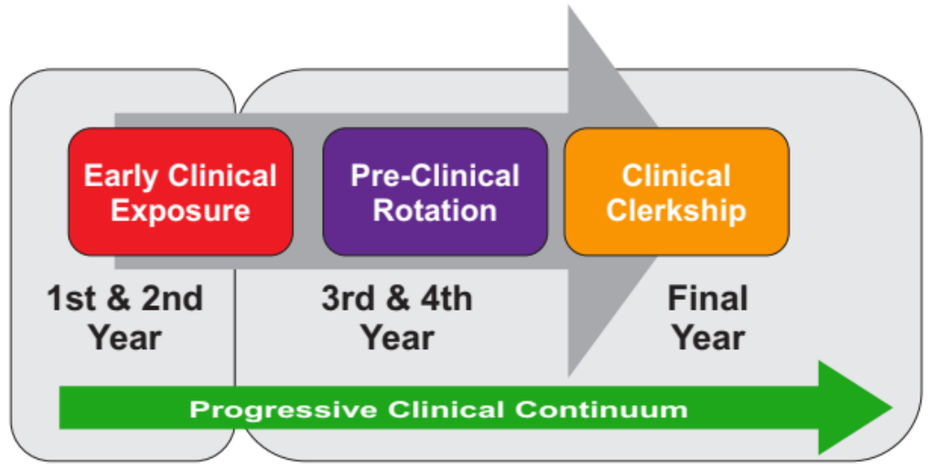
- MCQs (conceptual and application-based)
- SAQs focusing on molecular–clinical correlation
- OSPE/OSVE elements where applicable

Summary Statement

Theme Five exemplifies RMU-12's philosophy of "From Isolation to Beyond Boundaries" by translating molecular biology and genetics into meaningful clinical understanding through a structured Clinico -Concept Connect session. Operating at Harden Level 9 and aligned with early EPAs, this theme prepares students for progressive entrustment, clinical reasoning, and future practice-ready learning in molecular and precision medicine.

Foreword to Curriculum 2026

- Introduction
- Levels of Integration
- PMDC Seven Star Doctor Competencies
- Contextualization in the curriculum
- Context Facets of Curriculum 2026 at Rawalpindi Medical University
- Process of Curriculum Development
- Curricular Organization and Structure



Integrated Curriculum Design

Introduction

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

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

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

What is curriculum?

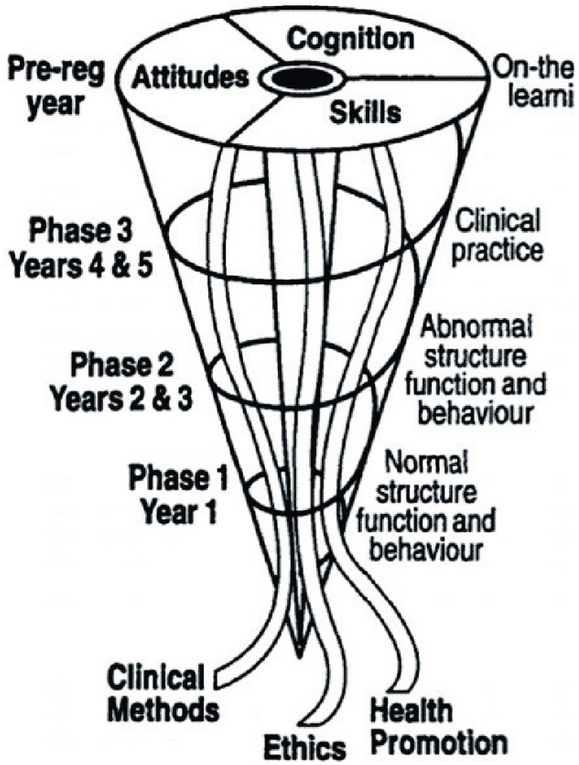
According to definition curriculum can be classified into five categories:

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

What is a Integrated Medical Curriculum?

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

Most curricula for medical education have been integrated horizontally and vertically–-vertically between basic and clinical sciences. The Flexnerian curriculum has disappeared to permit integration between basic sciences and clinical sciences, which are taught throughout the curriculum. We have proposed a different form of integration where the horizontal axis representsthe 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.



A Spiral Curriculum

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 patientsare 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 studentsto think as doctors from the day they enter medical school.

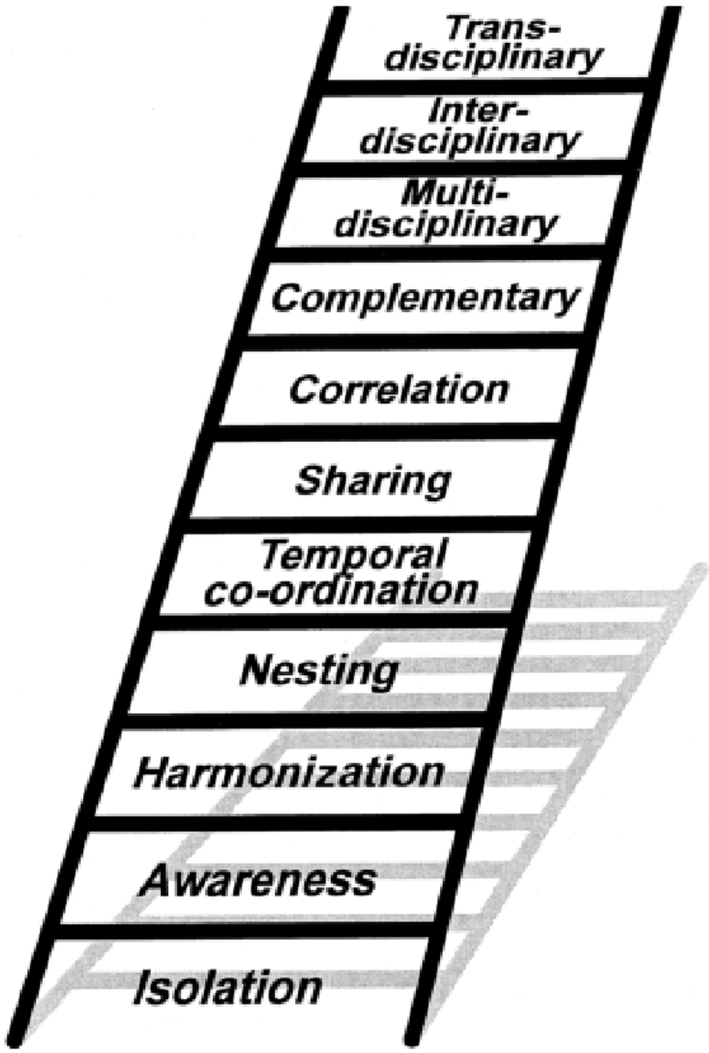
Integration is therefore of key importance for medical education because basic science learning isplaced in the context of clinical and professional practice and is considered by students to be moremeaningful and relevant. In the vast majority of curriculum reforms, vertical integration combinesbasic 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 isbased on a biologist's vision of the health-illness process

Levels of Integration

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

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

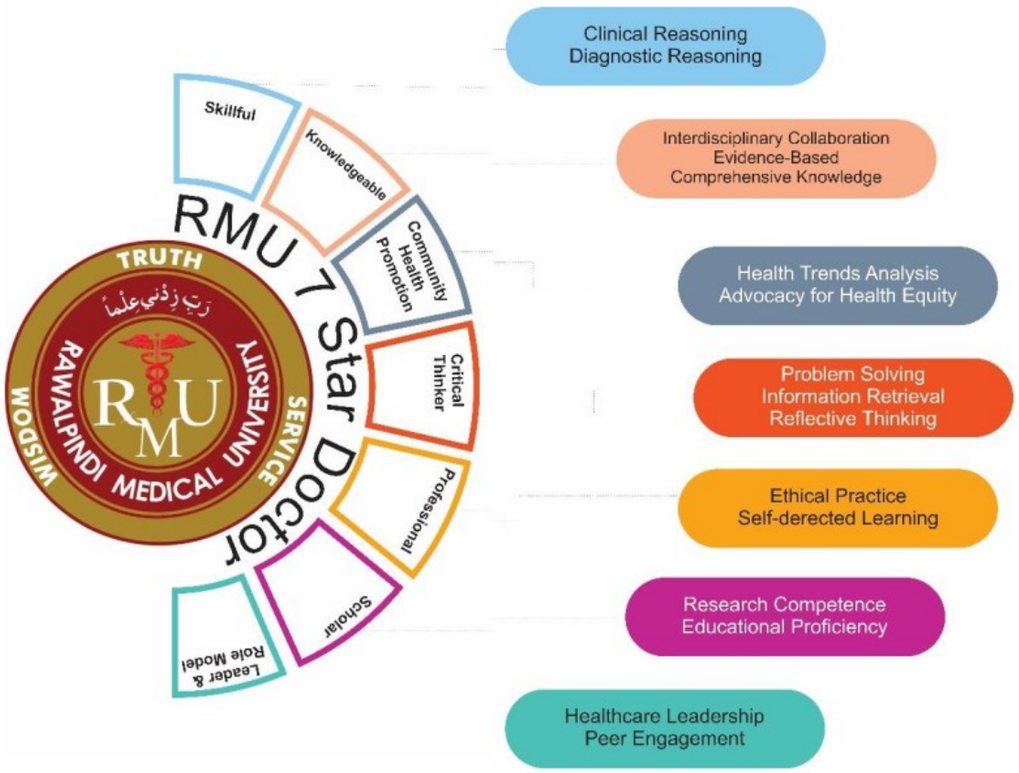
As our students progress through their education, the degree of clinical teaching intensifies. This gradual increase is deliberate, ensuring that by the time our students reach their final year, they are well-prepared to engage in extensive clerkships. Year V is exclusively devoted to these clerkships,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



Harden's Integration Ladder

PMDC Seven Star Doctor Competencies

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



RMU 7 Star Doctor

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.

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

Context Facets of Curriculum 2024 at Rawalpindi Medical University

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

Key perspectives for the context of change include:

•The exponential growth in course content due to educational advancements, technological innovations, and scientific discoveries requires prioritization, removal of outdated concepts, and modern information transfer methods.

•Evolving societal expectations of healthcare workers necessitate balancing patient satisfaction with health system responsiveness. The curriculum should address societal needs, healthcare access, resource equity, and system awareness.

•The post-pandemic era's shift towards hybrid learning and online methodologies necessitates a curriculum that accommodates these new educational paradigms.

•The curriculum revision is aligned with global standards of Basic Medical Education and conforms to national regulations, ensuring international recognition and employability.

•The curriculum incorporates training in the affective domain to address societal expectations, legal awareness, and community interaction. This includes a dedicated ‘spiral’ for affective training, with assessments for the ‘PERLs’ domain.

•Student-centered approaches, such as Problem-Based Learning, electives, self-directed learning, and portfolio development, empower students in their educational journey.

Process of Curriculum Development

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

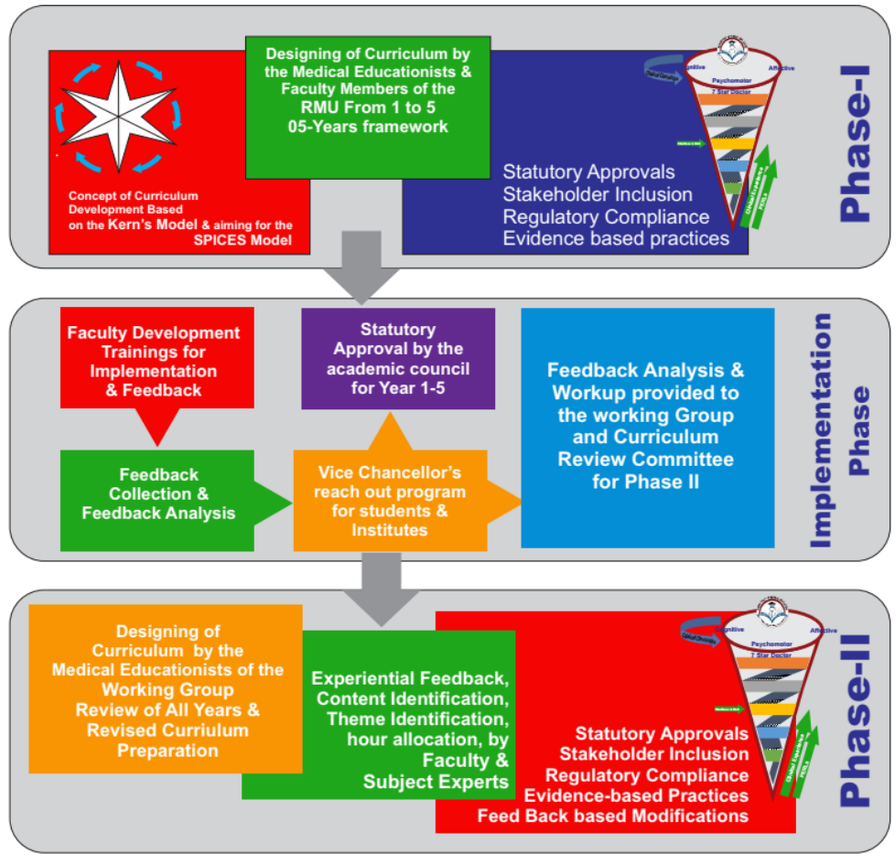
1. **Syllabi Development and Expert Consultation**: The first stage involved the formation of subject-specific advisory committees, engaging over 34 experts. Each committee focused on curating and refining the syllabi for their respective subjects. Their primary task was to incorporate all critical elements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

4. **Finalization of Modules**: A select group comprising Lead Medical Educationists and members from the Department of Medical Education undertook the final step of module finalization. This involved setting the structure, themes, time allocation, syllabi content, and emphasizing clinical relevance for each module.

5. **Statutory Approval and Integration**: The finalized modules and their associated assessment policies underwent a rigorous approval process through the Academic Council, and the Syndicate. Feedback and recommendations gathered during this statutory process were meticulously integrated into the curriculum guidelines.

6. **Adaptive and Feedback-Oriented Approach**: Recognizing the importance of adaptability and continuous improvement, the university incorporated a system for regular feedback and curricular evaluations. This system ensures that the curriculum remains dynamic, accommodating necessary updates and refinements as needed.

7. **Curriculum 2024 - A Modular Integrated Outcome-Based Approach**: The developed Curriculum is a testament to a comprehensive, outcome-based educational strategy. This strategy enables affiliated colleges to implement the curriculum effectively, respecting each institution's unique identity and vision, despite variations in available resources.



Phases of Curriculum Development

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.

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

Curricular Organization and Structure

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

Integrated Curriculum Design of RMU MBBS Program

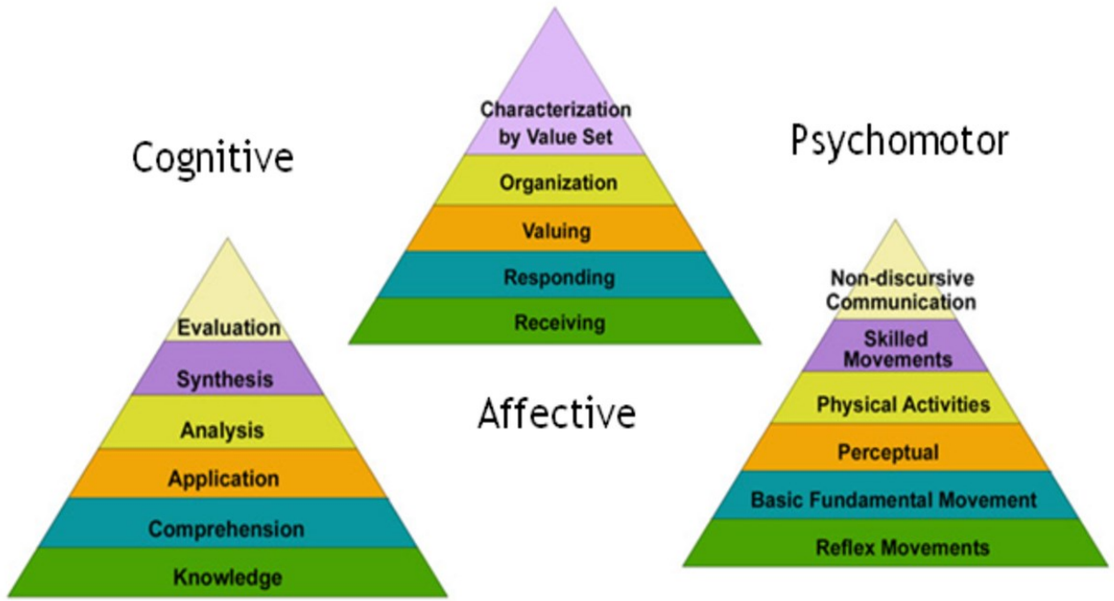
Two designs of the MBBS curriculum are acceptable by PMDC. System Based (Preferred) with horizontal and vertical integration. The curriculum of each Clinical Discipline must emphasize–Health Promotion and Disease Prevention‖, besides Curative Health Care. RMU has opted for system based modular curriculum.

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

Components of a Module:

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

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

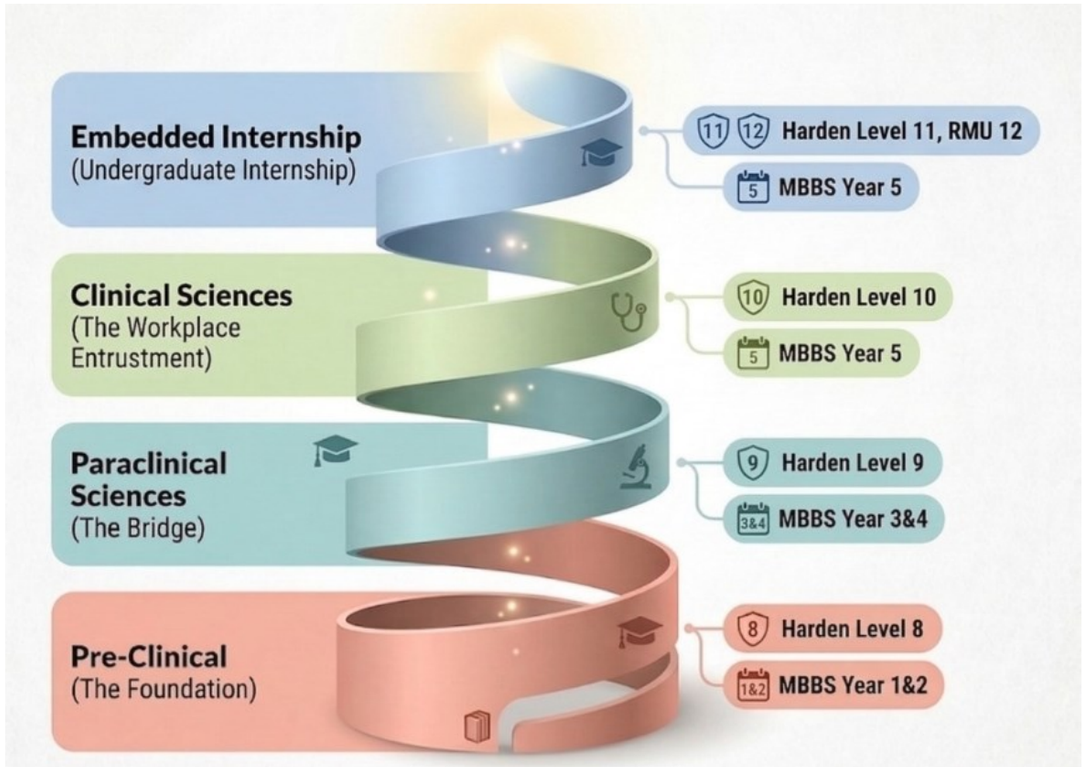
SECTION – III

- Competency Framework
  - Undergraduate Competency Model
  - Outcomes of the Curriculum

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



RMU – 12 Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

Competency Framework

Competency

PMDC



Figure 1

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Pakistan Medical & Dental Council Guidelines for Undergraduate Medical Education (MBBS) Curriculum – 2024

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.

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.
    - 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.

    - 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.
    - 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.

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.

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.
    - 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 of the Curriculum

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

Outcomes of the Undergraduate Integrated Modular Curriculum

The RMU-12 Model transforms medical education from isolated knowledge acquisition to embedded clinical practice, producing competent, ethical, and practice-ready physicians.

The RMU-12 Undergraduate Medical Program is 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.

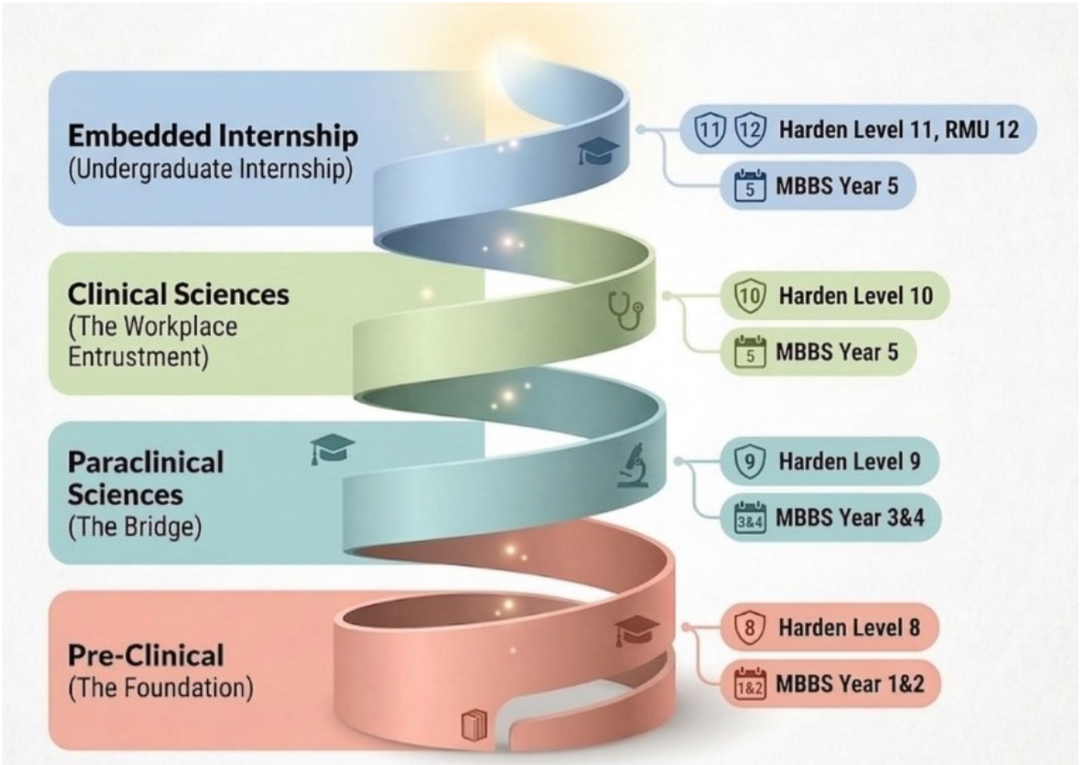
Kindle a spirit of inquiry and acquisition of knowledge to help you attain personal and professional growth & excellence.

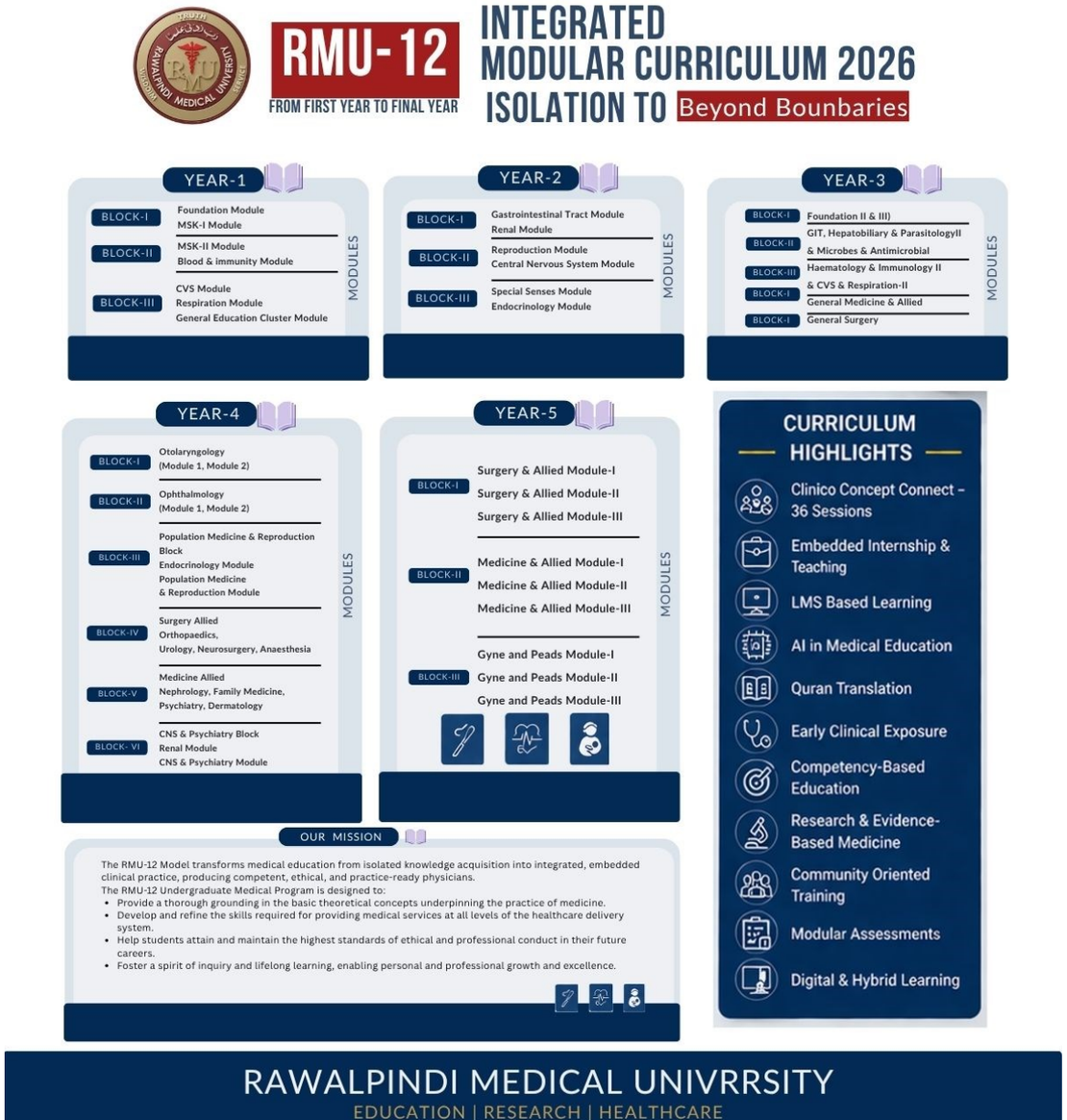
➢ **Structured Framework**

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries




RMU-12
FROM FIRST YEAR TO FINAL YEAR
INTEGRATED MODULAR CURRICULUM 2026
ISOLATION TO Beyond Bounbaries
YEAR-1
BLOCK-I
Foundation Module
MSK-I Module
BLOCK-II
MSK-II Module
Blood & immunity Module
BLOCK-III
CVS Module
Respiration Module
General Education Cluster Module
MODULES
YEAR-2
BLOCK-I
Gastrointestinal Tract Module
Renal Module
BLOCK-II
Reproduction Module
Central Nervous System Module
BLOCK-III
Special Senses Module
Endocrinology Module
MODULES
YEAR-3
BLOCK-I
Foundation II & III)
BLOCK-II
GIT, Hepatobiliary & ParasitologyII
& Microbes & Antimicrobial
BLOCK-III
Haematology & Immunology II
BLOCK-I
& CVS & Respiration-II
BLOCK-I
General Medicine & Allied
BLOCK-I
General Surgery
MODULES
YEAR-4
BLOCK-I
Otolaryngology
(Module 1, Module 2)
BLOCK-II
Ophthalmology
(Module 1, Module 2)
BLOCK-III
Population Medicine & Reproduction Block
Endocrinology Module
Population Medicine
& Reproduction Module
BLOCK-IV
Surgery Allied
Orthopaedics,
Urology, Neurosurgery, Anaesthesia
BLOCK-V
Medicine Allied
Nephrology, Family Medicine,
Psychiatry, Dermatology
BLOCK- VI
CNS & Psychiatry Block
Renal Module
CNS & Psychiatry Module
MODULES
YEAR-5
BLOCK-I
Surgery & Allied Module-I
Surgery & Allied Module-II
Surgery & Allied Module-III
BLOCK-II
Medicine & Allied Module-I
Medicine & Allied Module-II
Medicine & Allied Module-III
BLOCK-III
Gyne and Peads Module-I
Gyne and Peads Module-II
Gyne and Peads Module-III
MODULES
CURRICULUM HIGHLIGHTS
Clinico Concept Connect – 36 Sessions
Embedded Internship & Teaching
LMS Based Learning
AI in Medical Education
Quran Translation
Early Clinical Exposure
Competency-Based Education
Research & Evidence-Based Medicine
Community Oriented Training
Modular Assessments
Digital & Hybrid Learning
OUR MISSION
The RMU-12 Model transforms medical education from isolated knowledge acquisition into integrated, embedded clinical practice, producing competent, ethical, and practice-ready physicians.
The RMU-12 Undergraduate Medical Program is designed to:
• Provide a thorough grounding in the basic theoretical concepts underpinning the practice of medicine.
• Develop and refine the skills required for providing medical services at all levels of the healthcare delivery system.
• Help students attain and maintain the highest standards of ethical and professional conduct in their future careers.
• Foster a spirit of inquiry and lifelong learning, enabling personal and professional growth and excellence.
RAWALPINDI MEDICAL UNIVRRSITY
EDUCATION | RESEARCH | HEALTHCARE

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.

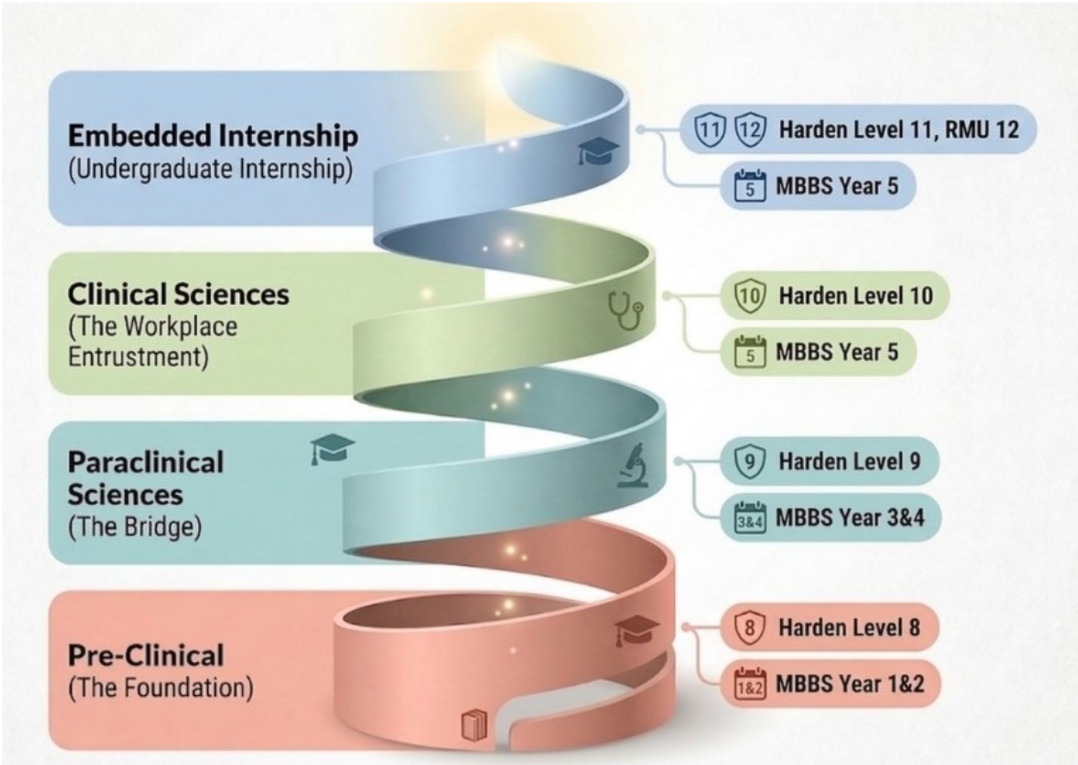
The final year focuses almost entirely on clinical clerkships in medicine and allied specialties, surgery and allied fields, gynecology, and pediatrics, representing the culmination of the horizontal and vertical integration model. Students apply their knowledge and skills comprehensively in real-world 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.

➢ Academic Calendar

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



Rawalpindi Medical University
Department of Medical Education (Main Campus)

DME/NO: 14 Date: 28-01-2026

Updated Academic Planner for Second Year MBBS (Batch-52)
2025 – 2026
Start of Session: 2nd March 2026
End of Session: 11th November 2026

Blocks	Block-IV							General Education Cluster (GEC) / SSM Module	Block-V								Block-VI					Schedule of Send Up and Professional Examination			
Module	GIT-I (05 Weeks)				Renal-I (04 Weeks)				Reproduction-I (04 Weeks)					CNS-I			Special Senses		Endocrinology-I						
	GIT Module-I	Student Week	Spring Vacation	Module Assessment	Renal Module-I	Module Assessment	Block-I Assessment		Reproduction Module-I		Summer Vacation	Reproduction Module-I		Module Assessments	CNS Module-I	Module Assessment	Block-II Assessment	Special Senses Module	Module Assessment	Endocrinology Module-I	Module Assessment	Block Assessment	Prep leaves for Pre-Annual Assessment	Pre- Annual Assessment	Prep Leaves for Professional Examination	Professional Examination
Duration in Weeks / Days	05 Weeks		01 Week	06 Days	03 Weeks	06 Days	03 Days	02 Weeks	01st Week	2nd Week (03 Days)		2nd Week (03 Days)	3rd Week	06 Days	05 Weeks	06 Days	03 Days	03 Weeks	06 Days	03 Weeks	06 Days	03 Days	10 Days	13 Days	20 Days	24 Days
Dates	2nd March – 04th April 2026	06th April – 11th April 2026	13th April – 18th April 2026	20th April – 25th April, 2026	27th April – 16th May 2026	18th May – 23rd May 2026	25th May – 27th May 2026	28th May – 10th June 2026	11th June – 17th June 2026	18th June – 20th June 2026	22nd June – 11th July 2026	13th July – 15th July 2026	16th July – 22nd July 2026	23rd July – 29th July 2026	30th July – 2nd Sep 2026	03rd Sep – 09th Sep 2026	10th Sep – 12th Sep 2026	14th Sep – 03rd Oct 2026	05th Oct – 10th Oct 2026	12th Oct – 31st Oct 2026	02nd Nov – 07th Nov 2026	09th Nov – 11th Nov 2026	12th Nov – 21st Nov 2026	23rd Nov – 05th Dec 2026	07th Dec – 19th Dec 2026	21st Dec 2026 – 13th Jan 2027

*Note: All dates are subject to change

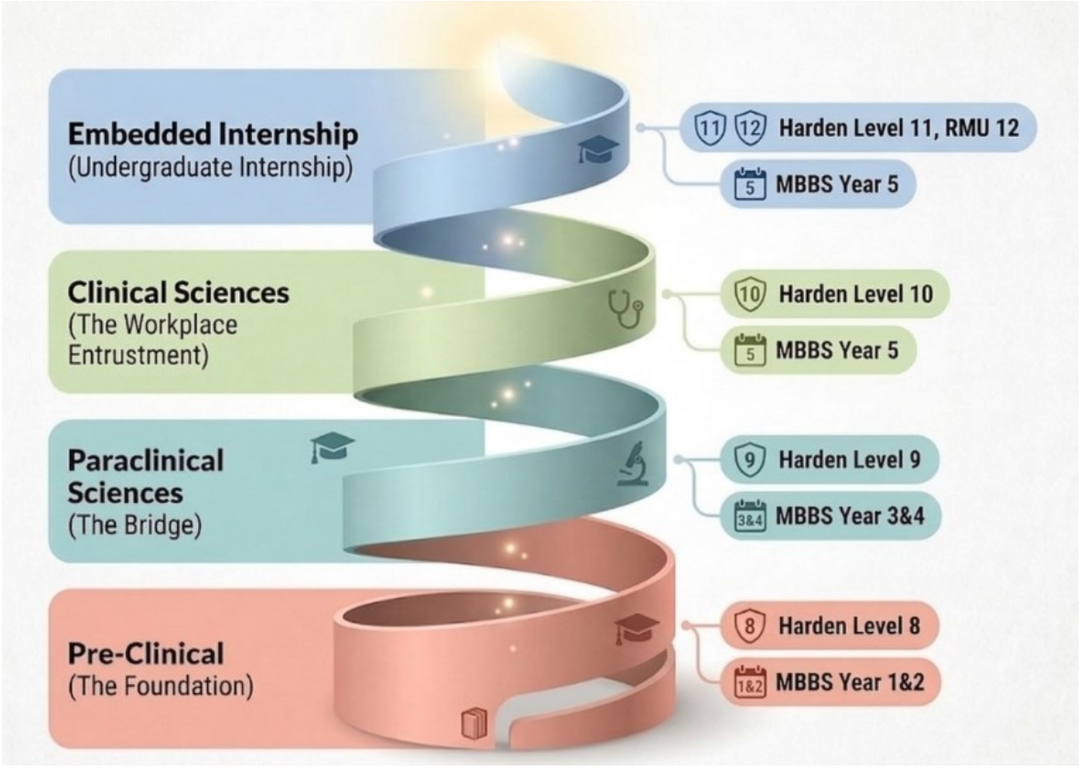
SECTION – IV

- Teaching Strategies

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



Teaching and Learning Methodologies / Strategies

Terms & Abbreviations

Contents

- Domains Of Learning
- Teaching And Learning Methodologies/Strategies
    - Clinico Concept Connect Session ($C^3$6)
    - Large Group Interactive Session (LGIS)
    - Small Group Discussion (SGD)
    - Self-Directed Learning (SDL)
    - Case Based Learning (CBL)
    - Problem- Based Learning (PBL)
    - Skill Labs/Practicals (SKL)

Tables & Figures

- Table1. Domains of Learning According to Blooms Taxonomy
- Figure 1. Prof Umar's Model of Integrated Lecture
- Table2. Standardization of Teaching Content in Small Group Discussions
- Table 3. Steps of Taking Small Group Discussions
- Figure 2. PBL 7 Jumps Model

Table 1. Domains of Learning According to Blooms Taxonomy

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

Teaching and Learning Methodologies / Strategies

Clinico - Concept Connect Session ($C^3$6)

Introduction:

A Clinico -Concept Connect Session is a **case-based, concept-driven educational encounter** in which a carefully designed clinical scenario is used as the central anchor to explore and integrate relevant concepts from basic and clinical sciences. This **Session** is an integrated teaching–learning activity designed to bridge the gap between **foundational biomedical concepts** and their **real-world clinical application**. It serves as a structured platform where students actively connect basic science principles with clinical reasoning, patient presentation, and professional decision-making, thereby promoting deeper understanding and long-term retention of knowledge.

This session moves beyond traditional discipline-based teaching by fostering **conceptual integration**, **contextual learning**, and **early clinical exposure**, enabling students to appreciate the relevance of basic sciences in patient care from the outset of their medical training.

Rather than teaching facts in isolation, the session emphasizes:

- Understanding **why** a concept matters clinically
- Applying **core principles** to explain patient findings
- Developing **clinical reasoning skills** in a guided, safe learning environment

The focus remains on **conceptual clarity**, **clinical correlation**, and **professional competence**, rather than diagnosis-driven or management-heavy discussions.

Structure of the Clinico -Concept Connect Session

The session is structured into clearly defined phases to ensure alignment with learning outcomes and progressive student engagement:

1. Clinical Trigger (Case Introduction)

- A concise, authentic clinical scenario is presented.
- The case is selected to naturally elicit key underlying concepts.
- Information is disclosed in a focused manner to stimulate curiosity and inquiry.

2. Concept Mapping and Exploration

- Relevant foundational concepts (e.g., physiological mechanisms, biochemical pathways, structural–functional relationships) are identified.
- Students are guided to link clinical signs, symptoms, and investigations to these concepts.

C3: Clinico Concept Connect
C6: Bloom's Level C6 (Creation / Synthesis)
Learners integrate knowledge from basic, para-clinical, and clinical sciences to formulate differential diagnoses, management plans, or clinical reasoning pathways, demonstrating higher-order thinking and decision-making.
Reference: Anderson, L. W., & Krathwohl, D. R. (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives.

- Emphasis is placed on **mechanisms**, not memorization.

3. Integrated Discussion

- Faculty from relevant disciplines facilitate discussion collaboratively.
- Concepts are reinforced through clinical correlation and guided questioning.
- Students actively participate in explaining findings using scientific reasoning.

4. Application and Reflection

- Learners reflect on how conceptual understanding informs clinical thinking.
- Key take-home messages are summarized.
- Opportunities for self-directed learning and further exploration are highlighted.

Implementation Strategy

The Clinico -Concept Connect Session is implemented as a **planned, scheduled activity** within the integrated curriculum and follows these principles:

- **Faculty Collaboration:** Basic science and clinical faculty jointly design and facilitate sessions to ensure coherence and relevance.
- **Curriculum Alignment:** Each session is mapped to predefined learning outcomes, competencies, and entrustable professional activities.
- **Active Learning:** Small-group discussions, guided questioning, and concept linking are emphasized over didactic teaching.
- **Progressive Complexity:** Early sessions focus on core concepts, with increasing clinical depth as students advance.
- **Feedback and Reflection:** Structured feedback is provided to reinforce learning and improve reasoning skills.

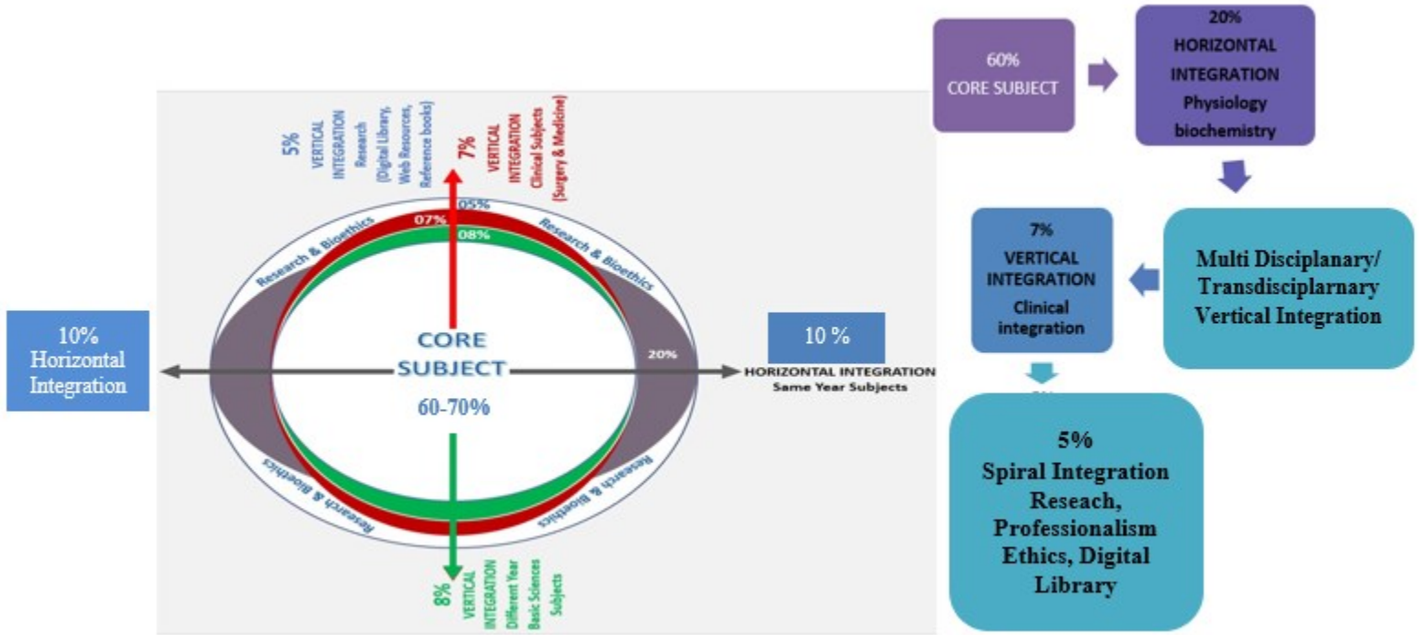
Educational Value

Through its integrated design, the Clinico -Concept Connect Session:

- Strengthens **conceptual understanding**
- Enhances **clinical reasoning and analytical skills**
- Encourages **horizontal and vertical integration**
- Promotes **student engagement and ownership of learning**
- Prepares learners to become **practice-ready, concept-driven clinicians**

Large Group Interactive Session (LGIS)

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



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	Core Concepts of the topic	60%
4	Horizontal Integration	24%
5	Vertical Integration	08%
6	Related Advance Research points	08%
7	Related Ethical points	
8	Artificial Intelligence	
9	Family Medicine	

Table 3. Steps of Implementation of Small Group Discussions

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

Self-Directed Learning (SDL)

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

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

  ii.OSPE station

Case Based Learning (CBL)

- It's a learner centered model which engages students in discussion of specific case scenarios that typically resemble real world examples.
- Case Scenarios must be multi-disciplinary/transdisciplinary and interdisciplinary
- Case scenario will be given to the students
- Will engage students in discussion of specific scenarios that resemble or typically are real-world examples.
- Learning objectives will be given to the students and will be based on
  i. To provide students with a relevant opportunity to see theory in practice
  ii. Require students to analyze data in order to reach a conclusion.
  iii. Develop analytic, communicative, and collaborative skills along with content knowledge.

Problem Based Learning (PBL)

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

The 7- Jump-Format of PBL (Maastricht Medical School)		Learning Domain
Step 7	Syntheise & Report	C6
Step 6	Collect Information from outside	C6
Step 5	Generate learning Issues	C6
Step 4	Discuss and Organise Ideas	C4
Step 3	Brainstorming to Identify Explanations	C3
Step 2	Define the Problem	C1
Step 1	Clarify the Terms and Concepts of the Problem Scenario	C1
Problem- Scenario		

Figure 2. PBL 7 Jumps Model

Self-Directed Learning (SDL) at Rawalpindi Medical University (RMU)

What is Self-Directed Learning (SDL)?

Self-Directed Learning (SDL) is a learning approach in which students take responsibility for their own learning. In SDL, students are expected to:

- Identify what they need to learn
- Set learning goals
- Use appropriate learning resources
- Study independently
- Evaluate their own understanding

Faculty members act as facilitators and guides, helping students stay on track and achieve the learning outcomes.

Why is SDL Important in Medical Education?

SDL is a key part of modern medical education because it helps students develop skills needed for lifelong learning. SDL is important because it:

- Encourages independent and active learning
- Builds critical thinking and problem-solving skills
- Improves the ability to search and use evidence-based medical information
- Helps students become responsible and reflective learners
- Prepares future doctors to keep learning throughout their careers

Medical knowledge is constantly changing, so SDL helps students stay updated even after graduation.



SDL at RMU (How It is Conducted)

Rawalpindi Medical University (RMU) has formally incorporated SDL into the MBBS curriculum from Second Yearto Final Year.
RMU has developed structured curricula of Self-Directed Learning (SDL) across all professional years. These SDL curricula include:

- Approved SDL topics aligned with each module
- Clearly stated learning objectives for every topic
- A wide range of learning resources, including:
    - Textbook chapters
    - Research articles
    - Clinical guidelines
    - Online videos and interactive learning content
    - Resource links shared through official platforms

SDL at RMU is therefore a planned, organized, and curriculum-based learning activity, not just additional reading.

SDL Hours in the MBBS Program

SDL at RMU is implemented longitudinally across all professional years.

- The total SDL contribution is more than 500 hours
- These hours are distributed from Second Yearto Final Year MBBS

- The purpose is to gradually develop independent learning skills throughout the program

Assessment of SDL at RMU

At RMU, SDL is not only a learning strategy but also an assessed component of the curriculum.

- Students are provided SDL topics with objectives and learning resources.
- Students study these topics independently.
- To ensure regular engagement, RMU conducts weekly online LMS-based assessments
- These assessments help students:
    - Stay consistent in learning
    - Test their understanding
    - Receive feedback for improvement

Thus, SDL learning progress is continuously monitored through the institutional LMS system.

Alignment with PM&DC and WFME Standards

SDL at RMU is aligned with national and international standards of medical education.

PM&DC

Pakistan Medical & Dental Council (PM&DC) emphasizes structured teaching, learning strategies, and internal assessment systems within undergraduate medical education.

WFME

World Federation for Medical Education (WFME) standards highlight the importance of:

- Student-centered learning
- Independent learning skills
- Use of diverse learning resources
- Continuous assessment and quality assurance

RMU’s structured SDL program supports these global standards.

Practical Sessions/Skill Lab (SKL)

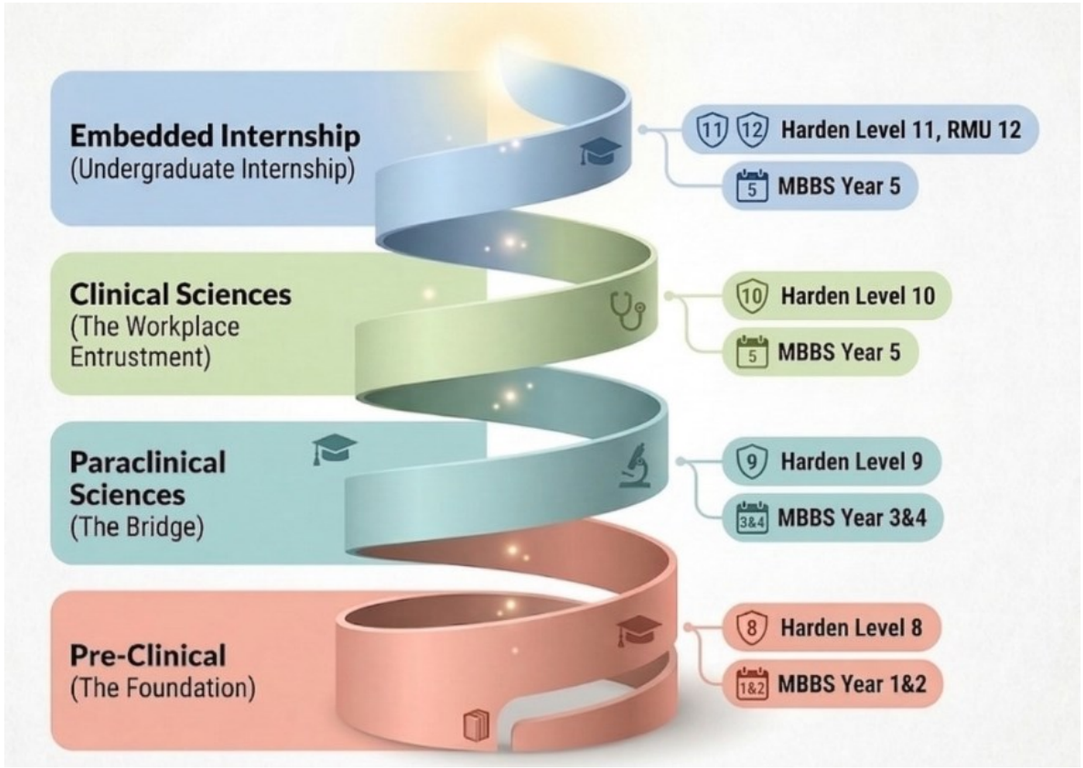
Practical Session/ Skill Lab (SKL)	
Demonstration/ power point presentation 4-5 slide and relevant clinical videos where required	10-15 minutes
Practical work	25-30 minutes
Write/ draw and get it checked by teacher	20-25 minutes
05 mcqs at the end of the practical	10 minutes
At the end of module practical 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	

➢ **List of Abbreviation**

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Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



List of Abbreviations	
AV	Audio Visual
B. P	Blood Pressure
CBL	Case Based Learning
CIA	Continuous Internal Assessment
CPR	Cardiopulmonary Resuscitation
CVS	Cardiovascular System
DME	Department of Medical Education / Director Medical Education
ECE	Early Clinical Exposure
ECG	Electrocardiogram (implied by context of leads and recordings)
EMQ	Extended Matching Question
GEC	General Education Cluster
HEC	Higher Education Commission
IUGRC	Integrated Undergraduate Research Curriculum
JVP	Jugular Venous Pressure
LGIS	Large Group Interactive Session
LMS	Learning Management System
MCQ	Multiple Choice Question
MSK	Musculoskeletal
OSPE	Objective Structured Practical Examination
PMDC	Pakistan Medical & Dental Commission
QAA	Quality Assurance Agency
QEC	Quality Enhancement Cell
RMU	Rawalpindi Medical University

SAQ	Short Answer Question
SDL	Self-Directed Learning
SEQ	Short Essay Question
SGD	Small Group Discussion
SKL	Skill Laboratory
TORS	Terms of Reference
UHS	University of Health Sciences

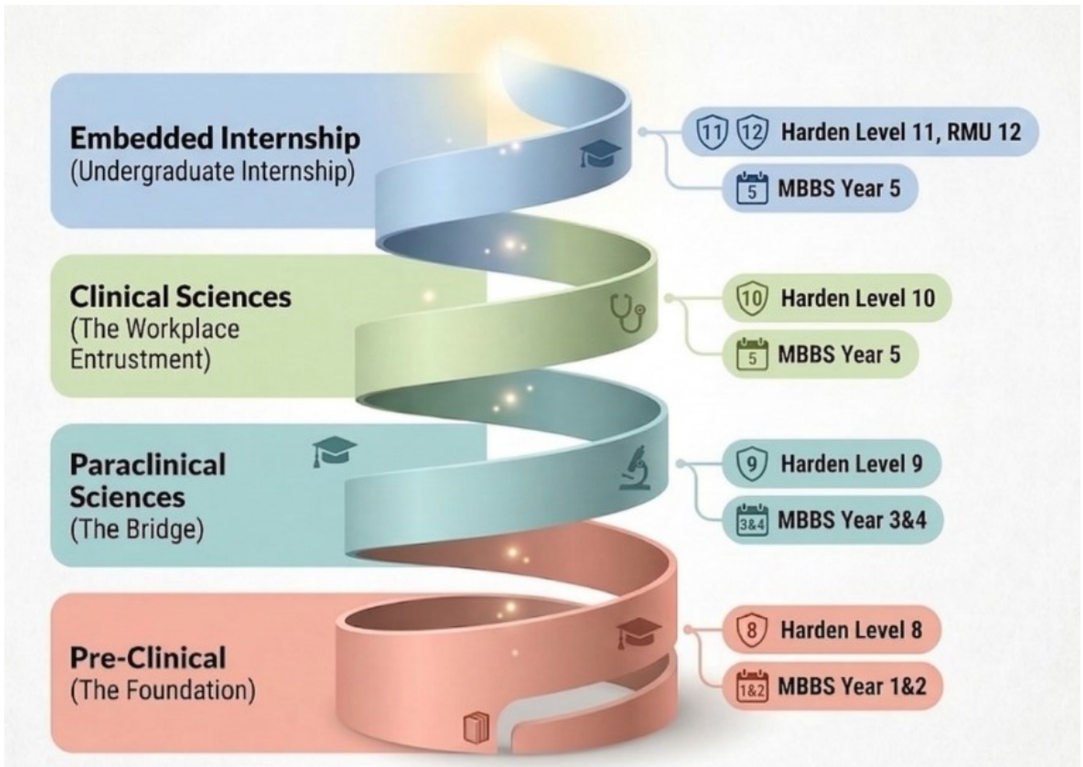
SECTION – V

- **Block-IV**
  - **Gastrointestinal Tract Module-I**
  - **Renal Module-I**

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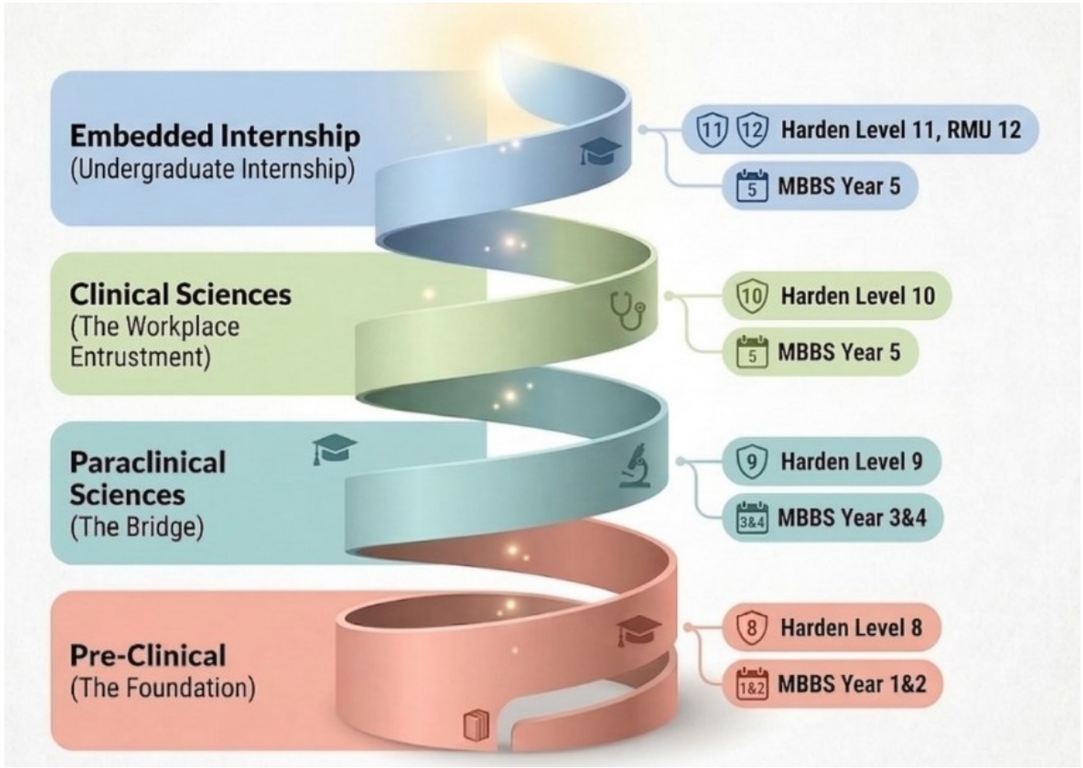


➢ Gastrointestinal Tract Module-I

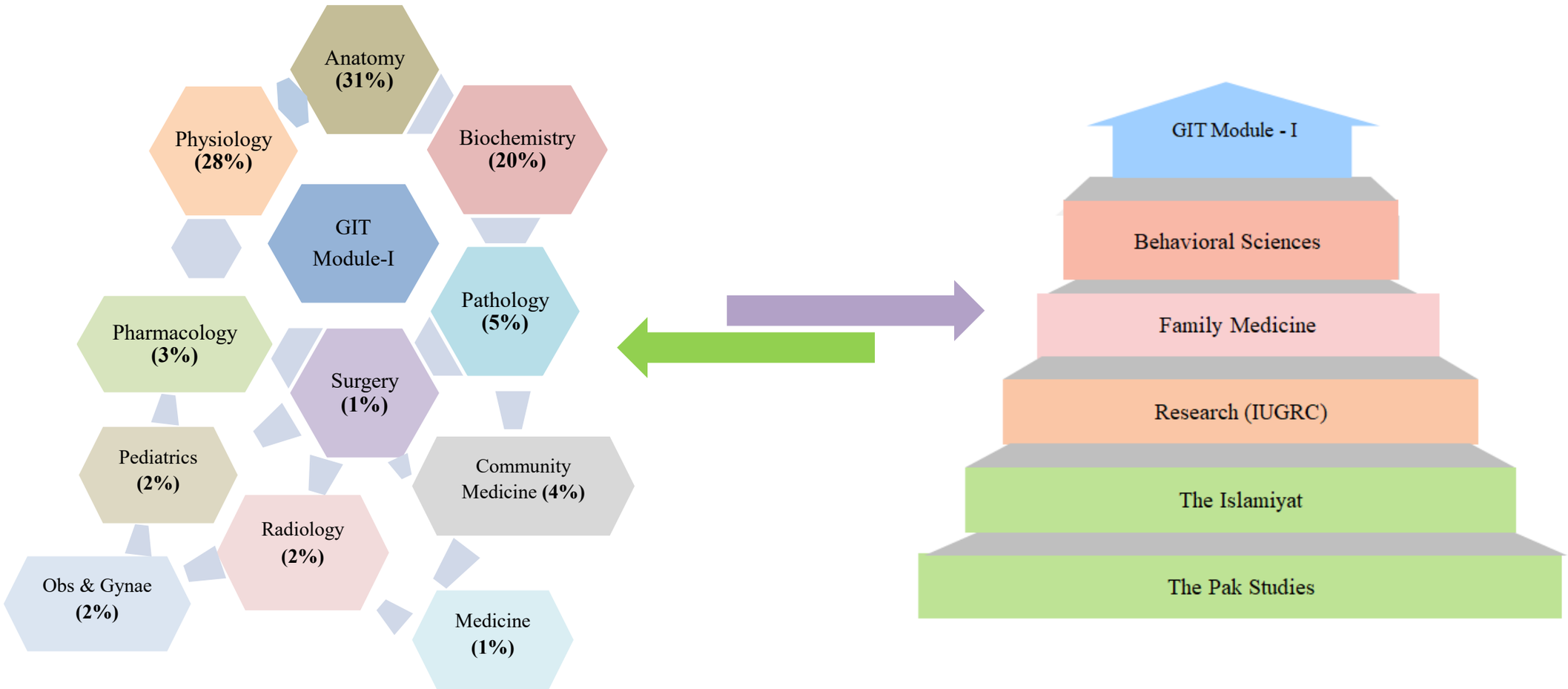
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Multi Disciplinary Integration



Disciplines in GIT Module - I

Spiral / General Education Cluster Courses (5%)

Discipline Wise Details of Modular Content

Integration					
Themes					
Block	**Module**	**General Anatomy**	**Embryology**	**Histology**	**Gross Anatomy**
IV	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			
	Spiral Courses				
	Pak Studies	• Nazria Pakistan-I • Nazria Pakistan -II • Allah SWT ki Hakmiyat ka Nifaz • Two Nation Theory • Establishment of an Islamic state			
	Islamiyat	• Toheed Related Quranic Verses & their Explanation • Toheed & Shirk • Risalat Related Quranic Verses & Their Explanation			
	Research (IUGRC)	• Introduction to descriptive statistics (Research-I) • Classification of different types of Data (Research-II) • Scales of Data measurement (Research-III) • Measures of central Tendency (Research-IV) • Geriatrics (Research-V) • Synopsis wrting session (Research Practical Session I)			
	Radiology	• Medical imaging of abdomen- I • Medical imaging of abdomen-II			
	Family Medicine	• Approch To A Patient with Epigastric Pain • Approch To A Patient with Hepatobiliary Disorders			
	Behavioral Sciences	• Medically Unexplained Symptoms • Learning & Memory • Eating Disorders			
	Community Medicine	Clinically content relevant to GIT Module - I • Concept of health & disease • Epidemiology of Infectious Diseases& Basic Concepts			

	Vertical Integration	
	• Gynae and OBS	• Physiologic Changes in the GIT in Pregnancy • Jaundice/Obstetric Cholestasis in Pregnancy
	• Medicine	• Inflammatory Bowel Diseases
	• Surgery	• Acute Abdomin • Gall Stones
	• Pediatrics	• Acute and Chronic Diarrhea Cute & Choronic Diaherrea
	• Pharmacology	• Anti Diarrheal Drugs
	• Pathology	• Pathologies of Intestine

GIT Module - I Team

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

Module Committee		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar
2.	Director DME & Dean Basic Sciences	Prof. Dr. Ifra Saeed
3.	Additional Director (Assessment) DME	Dr. Arsalan Manzoor Mughal
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar
5.	Chairperson Anatomy	Prof. Dr. Ayesha Yousaf
6.	Chairperson Biochemistry	Dr. Aneela Jamil
7.	Focal Person Anatomy 2nd Year MBBS	Dr. Maria Tasleem
8.	Focal Person Physiology	Dr. Sidra Hamid
9.	Focal Person Pharmacology	Dr. Zunera Hakim
10.	Focal Person Pathology	Dr. Syeda Ayesha
11.	Focal Person Behavioral Sciences	Dr. Zona Tahir
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom
13.	Focal Person Quran Translation Lectures	Dr. Fahd Anwar
14.	Focal Person Family Medicine	Dr. Sadia Khan

Module Task Force Team		
1.	Coordinator	Dr. Uzma Kiyani (Senior Demonstrator of Physiology)
2.	DME Focal Person	Dr. Farzana Fatima
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Module I -GIT Module - I

Rationale: GIT Module - I 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!

Themes, Learning Objectives, Teaching Strategies & Tool of Assessments

Contents

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

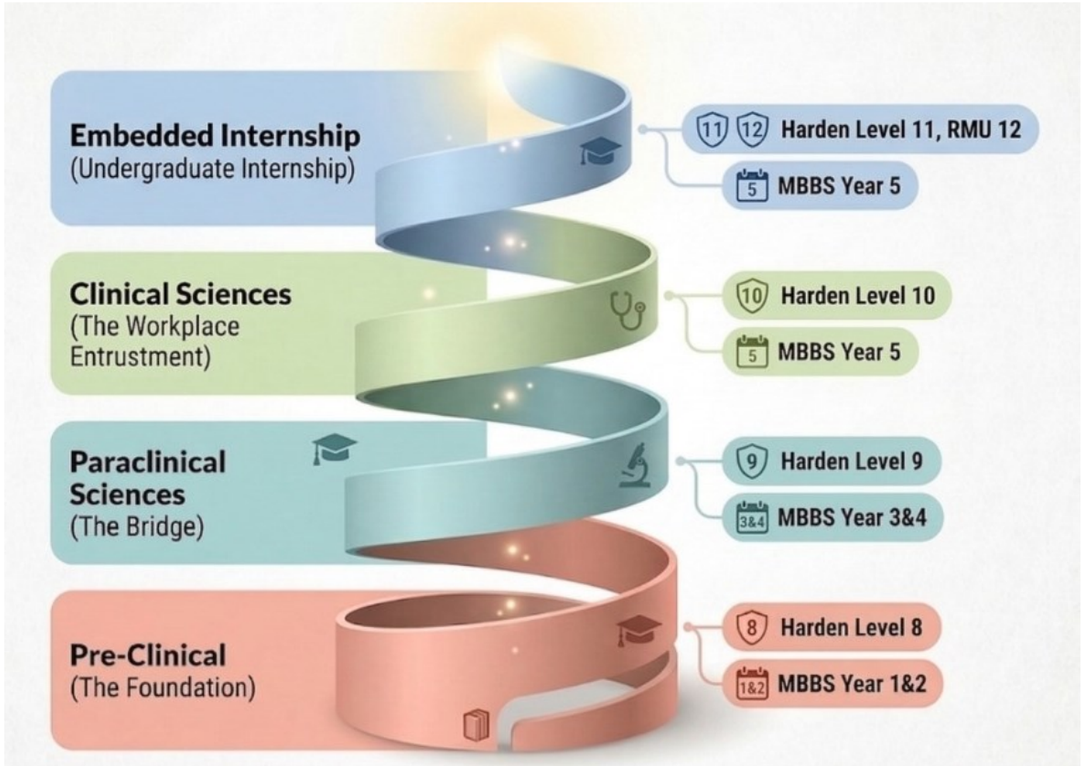
➢ **Syllabus GIT Module-I 2026**

Second Year MBBS

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



GIT – I Module – Second Year MBBS

Duration of Module (Five Weeks)

Sr No.	Themes	Duration
1.	Dysphagia & Disorders of Oral Cavity and Swallowing	1st Week
2.	Epigastric Pain & Peptic Ulcer Disease	2nd Week
3.	Chronic Diarrhea & Malabsorption Syndromes	3rd Week
4.	Jaundice & Hepatobiliary Disorders	4th Week
5.	Acute Abdomen & Large Intestinal Disorders	5th Week

Theme 1: Dysphagia & Disorders of Oral Cavity and Swallowing (1st Week)

Theme	Rationale	Learning objectives
Dysphagia & Disorders of Oral Cavity and Swallowing	Swallowing is a complex neuromuscular process involving coordinated actions of the oral cavity, pharynx, esophagus, and central and peripheral nervous systems. Disorders affecting swallowing significantly impact nutrition, airway protection, and quality of life. This theme integrates gross and microscopic anatomy of the oral cavity, pharynx, and esophagus, physiology of deglutition, and biochemical aspects of saliva and muscle metabolism with clinical conditions such as oropharyngeal and esophageal dysphagia, oral malignancies, neuromuscular disorders, and motility disorders, enabling students to understand the anatomical and physiological basis of clinical presentation and management.	At the end of this theme, students should be able to: 1. Describe the anatomy and applied anatomy of the oral cavity, pharynx, esophagus, and related neurovascular structures. 2. Explain the physiological phases of swallowing and neural control mechanisms involved in deglutition. 3. Discuss the composition and biochemical functions of saliva and its role in digestion and oral health. 4. Correlate structural and functional abnormalities with clinical presentations of dysphagia. 5. Interpret basic clinical investigations related to swallowing disorders (e.g., barium swallow, endoscopy). 6. Appreciate the multidisciplinary approach to diagnosis and management involving medicine, surgery, ENT, and radiology.

CASE 1: Dysphagia & Disorders of Oral Cavity and Swallowing

Presenting complaints:

Difficulty in swallowing solid food for 6 months

History of Present Illness:

A 52-year-old male presented to the OPD with progressive difficulty in swallowing, initially for solid food and later for semi-solid food. He also complained of a foreign body sensation in the throat and unintentional weight loss over the last 4 months. There was occasional regurgitation of undigested food. He denied choking or coughing during swallowing. No history of hematemesis. Voice quality remained normal.

Past Medical History:

No history of stroke, diabetes, or neuromuscular disease.

Family History:

Non-contributory.

Social History:

Resident of rural Punjab; chronic smoker for 25 years; uses naswar. Belongs to low socio-economic status.

Drug History:

Occasional use of painkillers; no long-term medications.

Examination:

GPE:

Middle-aged male, lean built, conscious and oriented.

Pulse: 82/min BP: 120/80 mmHg

Temp: 98°F R/R: 16/min

Mild pallor present; no jaundice.

Oral Cavity:

Poor oral hygiene; no visible ulcer or growth.

Systemic Examination:

CVS, Respiratory system, GIT and CNS: Unremarkable

Entrustable Professional Activities (EPAs)

EPA-1: Obtain a focused history for a patient presenting with dysphagia

- Elicit onset, progression (solids → liquids), associated symptoms (weight loss, regurgitation), and risk factors (smoking, naswar).
- **Entrustment level:** Observation only (Level 1)

EPA-2: Perform and interpret a basic examination relevant to swallowing disorders

- Examine oral cavity, assess nutritional status, and identify red-flag signs.
- **Entrustment level:** Performs with direct supervision (Level 2)

EPA-3: Correlate anatomical and physiological mechanisms with clinical dysphagia

- Differentiate oropharyngeal vs esophageal dysphagia using anatomy and physiology.
- **Entrustment level:** Discussion-based reasoning (Level 2)

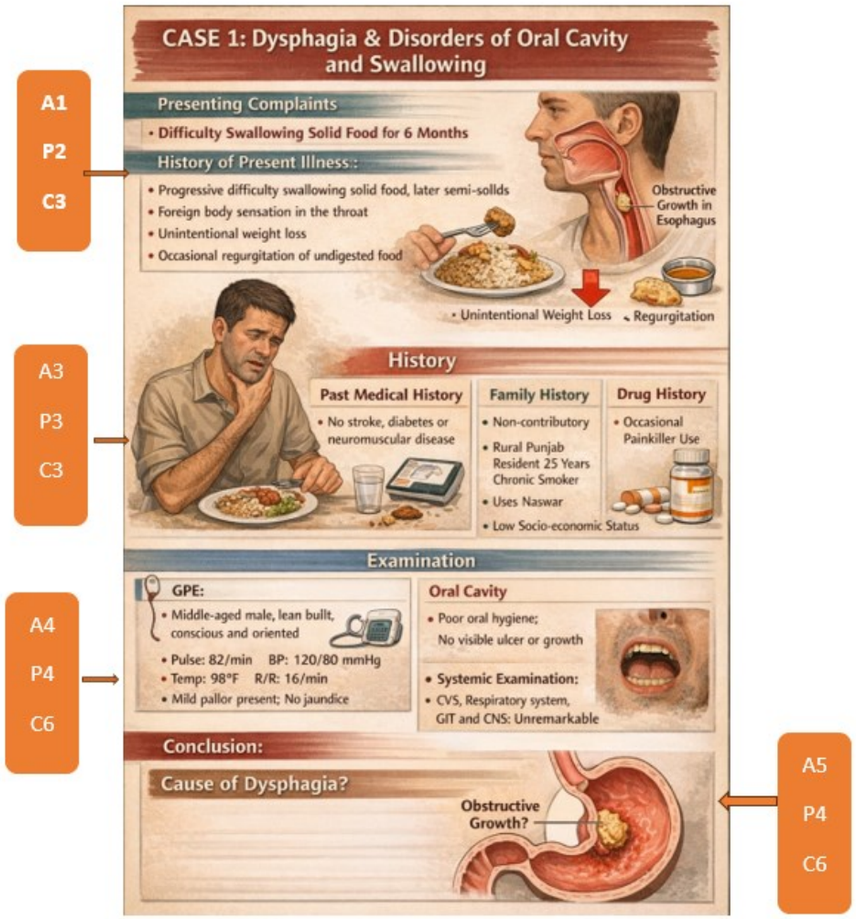
EPA-4: Interpret basic investigations related to dysphagia

- Explain the purpose and findings of barium swallow and endoscopy.
- Entrustment level: Interpretation with guidance (Level 2).

Justification:

This dysphagia case qualifies as Harden Level 11 integration because it dissolves disciplinary boundaries and requires learners to synthesize anatomy, physiology, pathology, clinical medicine, community health, and professionalism to manage a realistic patient problem. The focus on clinical reasoning, social determinants, and interprofessional care mirrors authentic healthcare practice, fulfilling the criteria for interdisciplinary integration.

Theme 1 Clinico-concept connect (C^36)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Theory							
Subject	**Code**	**Topic**	**Learning Objectives At the end of lecture students should be able to**	**Calgary Gauges**	**Learning Domain**	**Teaching Strategy**	**Assessment Tool**
Anatomy Embryology	M1-GIT-A-001	Development of Tongue	• Describe the development of pharyngeal apparatus	Must Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Enlist the sources for development of different parts of tongue.	Must Know	C1		
			• Explain the development of tongue along with its nerve supply.	Must Know	C2		
			• Describe the congenital anomalies associated with tongue	Should Know	C2		
			• Describe the developmental basis of physiological and biochemical mechanisms involved in perception and transmission of taste sensation	Must Know	C2		
			• Correlate with the clinical conditions	Should Know	C3		
			• Differentiate clinical conditions on basis of embryo.	Should Know	C4		
			• Understand curative and preventive heath care measures	Nice to know	C3		
			• Practice the principles of bioethetics	Nice to know	C3		
			• Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Nice to know	C3 C3 C3		
	M1-GIT-A-002	Development of Salivary glands	• Explain different stages of development of salivary glands	Must Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Enlist the sourse for development of different type of salivary gland	Must Know	C1		
			• Explain development of its nerve supply	Must Know	C2		
			• Describe the congenital anomalies associated with salivary glands	Must Know	C2		
			• Correlate with the clinical conditions	Should Know	C3		
			• Understand curative and preventive heath care measures	Nice to know	C3		
			• Practice the principles of bioethetics	Nice to know	C3		
			• Apply strategic use of A.I in health care	Nice to know	C3		

			measures. • Read relevant research articles. • Use HEC digital library		C3 C3		
Anatomy Histology	M1-GIT-A-003	Tongue	• Discuss surfaces of tongue with their histological features	Must Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Describe different papillae of tongue with their location & features	Must Know	C2		
			• Explain histological features of taste buds	Must Know	C2		
			• Prove with evidence importance of location of tongue wounds	Nice to Know	C5		
	M1-GIT-A-004	Salivary glands	• Explain the physiologic anatomy ofGIT	Must know	A	C2	SAQ MCQ VIVA OSPE
			• Explain histological structure of salivary glands	Must Know	C2		
			• Discuss different cells forming parenchyma of salivary glands	Must Know	C2		
			• Discuss histology of duct system	Must Know	C2		
			• Differentiate between major salivary glands on histological basis	Must Know	C2		
Anatomy (SGD)	M1-GIT-A-0010	Topographical organization of Gastrointestinal tract	• Enlist components of gastrointestinal tract	Must Know	C1	SGD	SAQ MCQ VIVA OSPE/OSCE
			• Mark the planes dividing the abdomen into nine quadrants	Should Know	P		
			• Enumerate the parts of GIT lying in the various quadrants • Correlate with the clinical conditions • Prove symptomatic co relation of 9 quardants • Understand curative and preventive heath 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	Should Know Should Know Nice to know Nice to know Nice to know Nice to know Nice to know Nice to know Nice to know	C1 C3 C3 C5 C3 C3 C3 C3 C3 C3 C3		
	M1-GIT-A-0011	Oral Cavity, tongue and salivary glands,	• Define the boundaries of oral cavity	Must Know	C1	SGD	SAQ MCQ VIVA OSPE
			• Tabulate the Extrinsic and Intrinsic muscles of the tongue, anatomical location and clinical importance of tongue	Must Know	C2		
			• Brief Introduction of salivary glands with their anatomical location • Correlate with the clinical conditions • Perform Survey in your own class on prevalence of oral cavity pathologies	Must Know Should Know Nice to know Nice to know	C1 C3 C3 C6		

			• Understand curative and preventive heath 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	Nice to know Nice to know Nice to know	C3 C3 C3		
	M1-GIT-A-0012	Anterolateral abdominal wall	• Explain the layers of abdominal wall.	Must Know	C2	SGD	SAQ MCQ VIVA OSPE
			• Explain the fascia and muscles of abdominal wall.	Must Know	C2		
			• Describe nerve supply of anterior and lateral abdominal wall.	Must Know	C2		
			• Explain the segmental sympathetic supplies	Must Know	C2		
			• Correlate the Anatomical knowledge with Abdominal Hernias • Analyze the layers of anterolateral abdominal wall to explain the anatomical basis of hernias and surgical approaches for abdominal incisions. • Evaluate different abdominal wall incisions in terms of muscle, nerve, and vascular involvement, and justify the most appropriate incision • Correlate with the clinical conditions • Understand curative and preventive heath 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	Should Know Should Know Nice to know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C4 C3 C3 C5 C4 C3		
	M1-GIT-A-0013	Rectus sheath,	• Describe Formation of rectus sheath	Must Know	C2	SGD	SAQ MCQ VIVA OSPE
			• Enlist contents of rectus sheath	Must Know	C1		
			• Discuss associated clinical anatomy • Correlate with the clinical conditions • Make video of dissection of rertus sheath in D.H • Understand curative and preventive heath 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	Should Know Should Know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C6 C3 C3 C3 C3		
Anatomy (SDL)		Layers of	• Explain the layers of abdominal wall. • Explain the fascia and muscles of abdominal wall.	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 183,184-216).			

	M1-GIT-A-0043	Antero lateral abdominal wall & its defects	• Describe nerve supply of anterior and lateral abdominal wall. • Explain the segmental sympathetic supplies	❖ https://3d4medical.com/			
	M1-GIT-A-0044	Applied Anatomy of Rectus sheath	• Describe Formation of rectus sheath • Enlist contents of rectus sheath • Describe Autonomic innervation of GIT	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 188-201). ❖ https://teachmeanatomy.info/			
Anatomy (SKL)	M1-GIT-A-0053	Tongue & salivary glands	• Focus & Identify slides of tongue & glands under microscope	Should Know	P	Skill lab	OSPE/OSCE
			• Illustrate histological structure of tongue & salivary glands	Must Know	C2		
			• Write two points of identification	Must Know	C1		
			• Illustrate histological structure of large intestine	Must Know	C2		
			• Write two points of identification	Must Know	C1		
Physiology (LGIS)	M1-GIT-P-001	Introduction to GIT & enteric nervous system	• Introduction to GIT	Must know	C2	LGIS	SEQ MCQ VIVA
			• Electrical activity in GIT	Must know	C1		
			• Describe physiological anatomy of enteric nervous system	Must know	C1		
			• Enlist functions of enteric nervous system	Must know	C1		
			• Compare and contrast Myenteric and Meissner‘s plexus	Must know	C4		
			• Stages of Sowlling	Must know	C1		
			• Clinical disorders of Sowlling, achalasia & vomiting	Must know	C1		
Physiology (SGD)	M1-GIT-P-0013	Introduction to GIT	• Enlist general four functions performed by GIT	Must Know	C1	SGD	SEQ MCQ VIVA
			• Recall physiological anatomy and blood flow through GIT	Should Know	C1		
			• Briefly discuss electrical activity of GIT smooth muscle	Must Know	C1		
	M1-GIT-P-0014	Swallowing	• Discuss in detail the three stages of swallowing	Must Know	C2		
			• Briefly discuss physiological anatomy of lower esophageal sphincter and distal end of esophagus and state their functional importance	Must Know	C2		
Physiology (SDL)	M1-GIT-P-0019	Introduction to GIT, electrical activity in GIT, Enteric Nervous System and GIT reflexes	• Introduction • Role of GIT in control system • Concept of Enteric nervous system • GIT reflexes and its clinical correlation	• Ganong’s Review of Medical Physiology.25TH Edition. Overview of gastrointestinal function and regulation (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)			
Physiology (SKL)	M1-GIT-P-0026	Sense of taste	• Apparatus identification	Must Know	P	Skill lab	OSPE
			• Principle	Must Know	C1		
			• Procedure	Must Know	P		
			• Precautions	Should Know	C1		
			• Recall taste modalities, taste pathway & abnormalities of taste	Must Know	C1		
Biochemistry (LGIS)	M1-GIT-B-001	Introduction to Carbohydrate metabolism	• Understand metabolic pathways	Should Know	C2	LGIS	MCQs, SAQs SEQs Viva
			• Discuss glucose entry into the cells	Should Know	C2		
	M1-GIT-B-002	Glycolysis and Fates of Pyruvate	• Explain types, reactions and regulation of Glycolysis	Must Know	C2	LGIS	MCQs, SAQs SEQs Viva
			• Describe fates of Pyruvate	Must Know	C2		
			• Explain related clinical disorders	Nice to Know	C3		
			• Differentiate Between Lactic Acidosis & Diabetics Ketoacidosis	Nice to Know	C4		
	M1-GIT-B-003	Gluconeogenesis	• Discuss substrates, reactions and regulation of Gluconeogenesis	Must Know	C2	LGIS	MCQs, SAQs SEQs Viva
	M1-GIT-B-004	Metabolism of monosaccharides and disaccharides (Fructose, Lactose, Galactose)	• Describe metabolism of monosaccharides and disaccharides (Fructose, Lactose, Galactose)	Must Know	C2	LGIS	MCQs, SAQs SEQs Viva
	M1-GIT-B-005	Saliva	• Explain the composition and functions of saliva	Must Know	C2	LGIS	MCQs, SAQs SEQs Viva
Biochemistry (SGD)	M1-GIT-B-0031	Saliva	• Explain formation, composition and biochemical functions of saliva.	Should Know	C2	SGD	MCQs
Biochemistry (SDL)	M1-GIT-B-0039	Glycolysis	• Understand glycolysis, its types and energy yield	❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#8, Page 100			

	M1-GIT-B-0040	Pyruvate kinase deficiency	• Explain Pyvuvate Kinase Deficiency	❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#9, Page 100-119.			
Biochemistry (SKL)	M1-GIT-B-0052	Saliva-I	• Understand Normal constituents of saliva Discuss effects of saliva on digestion of starch	Must Know	P	Skill Lab	OSPE
Gynae & Obs	M1-GIT-VI (Gynae & OBS)-001	Physiologic Changes in the GIT in Pregnancy	• Describe the hormonal and mechanical factors (especially the role of Progesterone and Human chorionic gonadotropin) responsible for gastrointestinal changes during pregnancy.	C1		LGIS	MCQs
			• Explain the physiological changes in different parts of the GIT (esophagus, stomach, intestines, and hepatobiliary system) and correlate them with common clinical symptoms such as nausea, vomiting, heartburn, and constipation.	C1			
			• Discuss the clinical significance of these changes and their implications for nutrition, drug absorption, and management of common gastrointestinal complaints in pregnancy.	C1			
Community Medicine	M1-GIT-SI(CM)-001	Concept of Health and Disease	• Define Health • Identify different phases of Health • Elaborate concepts of Health • Acknowledge Dimensions of Health • Elucidate Dimensions of health • Appreciate Determinants of Health • Describe the types of determinants	C1 C1 C1 C1 C1 C2 C2		LGIS	MCQs
	M1-GIT-VI(CM)-002	Basic Concepts of Infectious Disease Epidemiology	• Define important terms related to infectious disease epidemiology. • Differentiate between epidemic, endemic and pandemic • Describe the dynamics of transmission of disease • Explain the concept of incubation period and its importance. • Demonstrate the incidence of water related diseases in Pakistan and other developing countries	C1 C2 C2 C2 C1			

Spiral Courses (1st Week)

Behavioral Sciences

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(BS)-001	Medically Unexplained Symptoms / Stress Diarrhea, Non-Ulcer Dyspepsia	• To be able to Idetify the role Psychological factors in the aetiology of health problems	C1	LGIS	MCQs
		• To be able to describe the role of Psychological factors in Precipitation of Illness. • To identify clinical presentation of medically (MUS) un explained symtoms / Stess Diarrhea, Non-Ulcer Dyspepsia	C2 C2		

Pak Studies

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(PKS)-001	Nazria Pakistan	• Understand the concept of Nazria Pakistan, including its historical, cultural, and religious foundations.	C2	LGIS	SAQ

Transdisciplinary (Hardens Level 11) Clinico-Concept Connect ($C^3$6) Sessions for 1st Week

Session	Topic	Department	Education Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
\Clinico-Concept Connect ($C^3$6) Sessions -I	Dysphagia & Disorders of Oral Cavity and Swallowing	Anatomy	Swallowing involves coordinated oral, pharyngeal, and esophageal anatomy.	• Describe the anatomical divisions of the pharynx and esophagus.	C2	MCQ
				Identify structures involved in swallowing: • Tongue • Soft palate • Epiglottis • Upper esophageal sphincter	C2	MCQ
				• Explain the anatomical sites of esophageal constrictions where carcinoma commonly occurs.	C2	MCQ
		Physiology	Dysphagia reflects disruption of normal swallowing mechanisms.	• Explain the phases of swallowing:	C2	MCQ
				• Describe neural control of swallowing reflex.	C3	MCQ
				Differentiate swallowing dysfunction in: • Mechanical obstruction • Neuromuscular disorders	C5	MCQ
		Pathology	Progressive dysphagia in smokers raises suspicion of malignancy.	• Describe pathological types of esophageal carcinoma:	C4	MCQ
				• Explain risk factors and premalignant conditions.	C2	MCQ
				• Correlate progressive dysphagia with tumor growth and luminal narrowing.	C2	MCQ
		Pharmacology	Symptomatic management and supportive care involve drug use.	Identify drugs used for: • GERD-related strictures (PPIs) • Pain control in malignancy	C2	MCQ
				• Explain the role of chemotherapy agents in esophageal cancer (overview).	C5	MCQ
				• Discuss rational use of analgesics and avoidance of self-medication.	C5	MCQ
		Medicine	Core clinical discipline for evaluation of dysphagia.	• Differentiate causes of dysphagia: • Carcinoma esophagus • Achalasia • Esophageal stricture	C2	MCQ
				• Plan stepwise diagnostic evaluation.	C5	MCQ
				• Recognize red flag symptoms requiring urgent referral.	C5	MCQ
		Surgery	Definitive treatment often involves surgical and oncologic care.	• Outline surgical options for esophageal carcinoma.	C6	MCQ
				• Describe principles of cancer staging and multidisciplinary care.	C3	MCQ
				• Recognize palliative options in advanced disease.	C5	MCQ

Theme 2: Epigastric Pain & Peptic Ulcer Disease (2nd Week)

Theme	Rationale	Learning objectives
Epigastric Pain & Peptic Ulcer Disease	Epigastric pain is a common clinical presentation with a wide differential diagnosis. Understanding this symptom requires integration of gastric anatomy, physiology of acid secretion, and biochemical mechanisms of mucosal protection. This theme links foundational knowledge with clinical entities such as gastritis, peptic ulcer disease, Helicobacter pylori infection, and NSAID-induced mucosal injury, allowing students to appreciate disease pathogenesis, clinical features, and rational therapeutic approaches.	Students should be able to: 1. Describe the gross and microscopic anatomy of the stomach and proximal duodenum. 2. Explain the physiology of gastric secretion, regulation of acid production, and gastric motility. 3. Discuss the biochemical basis of mucosal defense, including prostaglandins and bicarbonate secretion. 4. Correlate pathophysiological mechanisms with clinical features of peptic ulcer disease. 5. Understand the basis of pharmacological management (e.g., PPIs, H2 blockers). 6. Interpret common diagnostic modalities such as endoscopy and H. pylori testing.

E 2: Epigastric Pain & Peptic Ulcer Disease

Presenting complaints:
Burning epigastric pain for 3 months

History of Present Illness:
A 40-year-old male presented with burning pain in the epigastrium, worse on an empty stomach and partially relieved by meals. Pain occasionally woke him up at night. He also complained of nausea and early satiety. No vomiting or melena. Symptoms worsened after taking painkillers for backache.

Past Medical History:
No known chronic illness.

Family History:
Father had similar complaints and was treated for peptic ulcer disease.

Social History:
Office worker; smokes 10 cigarettes/day; consumes spicy food frequently.

Drug History:
Frequent NSAID use.

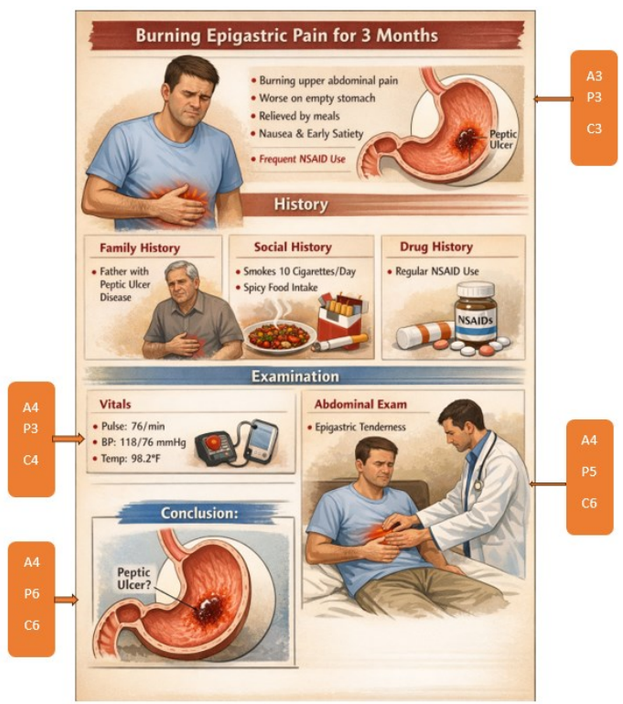
Examination:

GPE:
Average-built male, alert and oriented.
Pulse: 76/min BP: 118/76 mmHg
Temp: 98.2°F R/R: 14/min

Abdominal Examination:
Mild tenderness in epigastric region; no organomegaly.

Other Systems:
CVS, Respiratory and CNS: Normal.

Theme 1 **Clinico-concept connect ($C^3$6) Sessions**



Harden Level 11 Transdisciplinary

Entrustable Professional Activities (EPAs)

EPA-1: Elicit a structured history in a patient with epigastric pain
• Characterize pain, relation to meals, nocturnal symptoms, NSAID use, and smoking.
• Entrustment level: Observation only (Level 1)
EPA-2: Perform focused abdominal examination for dyspepsia
• Identify epigastric tenderness and exclude acute abdomen.
• Entrustment level: Performs with direct supervision (Level 2)
EPA-3: Explain pathophysiology of peptic ulcer disease
• Correlate acid secretion, mucosal defense, H. pylori, and NSAIDs with symptoms.
• Entrustment level: Reasoning under supervision (Level 2)
EPA-4: Interpret basic diagnostic and management principles of PUD
• Understand indications of endoscopy and rationale of PPIs/H2 blockers.
• Entrustment level: Conceptual application (Level 2)

Justification:
This case of epigastric pain suggestive of peptic ulcer disease justifies Harden Level 11 (interdisciplinary integration) as described by Ronald Harden, because it requires learners to synthesize knowledge from multiple disciplines around a real clinical problem rather than studying subjects in isolation. Understanding the patient's symptoms demands integration of anatomy (stomach and duodenum), physiology (gastric acid secretion and mucosal protection), pathology (ulcer formation and mucosal injury), pharmacology (effects of NSAIDs, proton pump inhibitors, H. pylori eradication therapy), and clinical medicine (diagnostic approach and management). Additionally, community medicine and behavioral sciences are incorporated through risk factors such as smoking, dietary habits, and NSAID misuse, highlighting prevention and lifestyle counseling. The case promotes clinical reasoning—linking nocturnal pain, relief with meals, and NSAID use to ulcer disease—while also emphasizing patient education and rational drug use, thereby dissolving disciplinary boundaries and reflecting authentic, holistic patient care consistent with Level 11 integration.

Specific Learning Objectives

Theory							
Subject	**Code**	**Topic**	**Learning Objectives At the end of lecture students should be able to**	**Calgary Gauges**	**Learning Domain**	**Teaching Strategy**	**Assessment Tool**
Embryology							
Embryology	M1-GIT-A-005	Development of Esophagus	• Discuss the formation of tracheoesophageal septum and its importance	Must Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Describe salient features of esophageal development	Must Know	C2		
			• Describe congenital anomalies of esophagus	Must Know	C2		
			• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of swallowing • Search by available online data highest occurring esophageal developmental defect	Must Know Nice to know	C2 C5		
			• Correlate with the clinical conditions	Should Know	C3		
			• Understand curative and preventive heath care measures	Nice to know	C3		
			• Practice the principles of bioethetics	Nice to know	C3		
			• Apply strategic use of A.I in health care	Nice to know	C3		
	M1-GIT-A-006	Development of Stomach	• Explain the development of stomach	Must Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Discuss rotations and positional shifts of stomach & their effect on nerve supply and peritoneal attachments	Must Know	C2		
			• Explain formation of omental bursa.	Must Know	C2		
			• Describe congenital anomalies of stomach	Must Know	C2		
			• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of digestion in the stomach • Discuss pernicious anemia • Construct a clinico-embryological flow diagram or case scenario linking abnormal stomach development to resultant anatomical and surgical findings.	Must Know Nice to know	C2 C2 C6		
			• Correlate with the clinical conditions	Should Know	C3		
			• Understand curative and preventive heath care measures	Nice to know	C3		

			• Practice the principles of bioethetics	Nice to know	C3		
			• Apply strategic use of A.I in health care	Nice to know	C3		
Histology	M1-GIT-A-007	General organization of GIT	• Describe the developmental basis of physiological and biochemical mechanisms involved in perception and transmission of taste sensation	Must Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Describe the histological characteristics of each layer with functional significance	Must Know	C2		
			• Discuss associated clinicals (megacolon, chagas disease) • Evaluate histiological basis of pathologies of GIT • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Should Know Should Know Nice to know Nice to know Nice to know	C3 C3 C5 C3 C3 C3 C3		
	M1-GIT-A-008	Esophagus	• Describe the histological layers of esophagus.	Must Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Compare between various portions of esophagus histologically.	Must Know	C2		
			• Discuss GERD • Analyze and compare the histological layers and epithelial linings of the esophagus to explain their functional adaptations for protection, secretion, and digestion. • • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Should Know Should Know Nice to know Nice to know Nice to know	C2 C4 C3 C3 C3 C3		
	M1-GIT-A-009	Stomach	• Describe the histological layers of different parts of stomach	Must Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Describe histological differences of different parts of the gastric glands	Must Know	C2		
			• Describe the structure and function of different cells of gastric glands	Must Know	C2		
			• Explain clinical conditions associated with stomach histologically	Should Know	C2		

			• Discuss pernicious anemia • Develop a clinico-histological correlation using histological features to differentiate normal from pathological sections of the stomach. • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Should Know Should Know Nice to know Nice to know	C2 C6 C3 C3 C3		
Anatomy (SGD)	M1-GIT-A-0024	Inguinal Region & Inguinal Hernias	• Describe Walls of Inguinal Canal	Must Know	C2	SGD/Skill lab	SAQ MCQ VIVA OSPE/OSCE
			• Explain Deep & Superficial Inguinal Ring	Must Know	C2		
			• Enumerate Structures passing through the inguinal canal	Must Know	C1		
			• Enlist Coverings of spermatic cord	Must Know	C1		
			• Explain Mechanics of the inguinal Canal	Must Know	C2		
			• Describe boundaries of Hassalbachs triangle	Must Know	C2		
			• Define hernia	Should Know	C1		
			• Differentiate indirect from direct inguinal hernia • Map outline of inguinal canal on simulated patient /model • Evaluate anatomical relationships of inguinal hernias with respect to the inferior epigastric vessels, spermatic cord, and coverings, and justify the clinical distinction between direct and indirect hernias. • Correlate with the clinical conditions • Understand curative and preventive heath 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	Should Know Should Know Nice to know Nice to know Nice to know	C3 P+A C3 C3 C3 C5 C3 C3		
	M1-GIT-A-0025	Testes, scrotum	• Define Anatomy of Testes and Scrotum	Must Know	C1	SGD/Skill lab	SAQ MCQ VIVA OSPE
			• Differentiate between Protective Coverings of Testes & scrotum	Must Know	C2		
			• Enumerate Nerve & blood supply of these Structures	Must Know	C1		
			• Discuss the parts of epididymis	Must Know	C2		
			• Discuss Spermatocoele, Varicocoele, Hematocoele, hydrocoele, Testicular torsion • Evaluate the clinical significance of the anatomical relations, vascular supply, venous drainage, and lymphatic	Should Know	C2 C3		

			drainage of the testes and scrotum in conditions such as varicocele, torsion of testis, hydrocele, and testicular tumors. • Correlate with the clinical conditions • Understand curative and preventive heath 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	Nice to know Nice to know Nice to know Nice to know Nice to know	C5 C3 C3 C3 C3		
	M1-GIT-A-0026	Peritoneum & Peritoneal Cavity	• Define peritoneum	Must Know	C1	SGD/Skill lab	SAQ MCQ VIVA OSPE
			• Explain the different folds of peritoneum.	Must Know	C2		
			• Describe greater and lesser sacs	Must Know	C2		
			• Enlist the intra and retroperitoneal viscera	Must Know	C1		
			• Discuss vertical tracings of peritoneum • Design a clinico-anatomical or imaging-based map of the peritoneal cavity demonstrating fluid pathways, dependent spaces, and safe surgical or laparoscopic access points. • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must Know Nice to know Should Know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C6 C3 C3 C3 C3		
	M1-GIT-A-0027	Subdivisons of Peritoneal Cavity	• Describe arrangement of peritoneum in transverse & Longitudinal section of abdomen	Must Know	C2	SGD/Skill lab	SAQ MCQ VIVA OSPE
			• Describe arrangement of peritoneum in transverse section of male pelvis	Must Know	C2		
			• Explain arrangement of peritoneum in transverse section of female pelvis	Must Know	C2		
			• Explain the layers, folds, recesses and compartments of peritoneum with their clinical importance	Must Know	C2		
			• Describe peritonitis	Should Know	C3		
			• Enumerate the signs and symptoms of peritonitis	Should Know	C3		

			• Treat peritonitis by antibiotics and peritoneal dialysis • Correlate with the clinical conditions • Understand curative and preventive heath 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	Should Know Should Know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3		
	M1-GIT-A-0028	Esophagus	• Discuss gross features of abdominal part of esophagus	Must Know	C2	SGD/Skill lab	SAQ MCQ VIVA OSPE
			• Enumerate their peritoneal & visceral relations.	Must Know	C1		
			• Explain blood supply, lymphatic drainage & nerve supply of esophagus	Must Know	C2		
			• Discuss Esophageal varices • Evaluate the vascular supply, venous drainage, nerve supply, and lymphatic drainage of the esophagus to explain their role in portal–systemic anastomosis, carcinoma spread, and surgical complications • Correlate with the clinical conditions • Understand curative and preventive heath 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	Should Know Should Know Should Know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C5 C3 C3 C3 C3 C3 C3		
	M1-GIT-A-0029	Stomach	• Explain gross features of stomach.	Must Know	C2	SGD/Skill lab	SAQ MCQ VIVA OSPE/OSCE
			• Discuss blood supply, lymphatic drainage & nerve supply of stomach	Must Know	C2		
			• Explain peritoneal & visceral relations of stomach	Must Know	C2		
			• Discuss greater and lesser omentum	Must Know	C2		
			• Describe formation and boundaries of epiploic foramen • Map outline of stomach on simulated patient /model • Correlate with the clinical conditions • Construct a clinico-anatomical or radiological correlation model integrating the gross anatomy of the stomach to guide safe surgical, endoscopic, or diagnostic interventions. • Understand curative and preventive heath care measures. • Practice the principles of bioethetics	Must Know Should Know Should Know Nice to know Nice to know	C2 P+A C3 C6 C3		

			• Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library	Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3		
Anatomy (SDL)	M1-GIT-A-0045	Applied Anatomy of Inguinal region & Hernias	• Enlist contents of rectus sheath • Describe Walls & detailed anatomy of Inguinal Canal • Explain Deep & Superficial Inguinal Ring • Associated Clinicals	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 197, 202-203, 212-213). ❖ https://3d4medical.com/			
	M1-GIT-A-0046	Peritoneal Dialysis/Peritoneal Lavage	• Define peritoneum • Explain the different folds of peritoneum. • Describe greater and lesser sacs • Enlist the intra and retroperitoneal viscera • Discuss vertical tracings of peritoneum • Describe arrangement of peritoneum in transverse & Longitudinal section of abdomen • Describe arrangement of peritoneum in transverse section of male pelvis • Explain arrangement of peritoneum in transverse section of female pelvis • Explain the layers, folds, recesses and compartments of peritoneum with their clinical importance • Describe peritonitis • Enumerate the signs and symptoms of peritonitis • Treat peritonitis by antibiotics and peritoneal dialysis	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 219-221,). ❖ https://teachmeanatomy.info/			
Anatomy (SKL)	M1-GIT-A-0054	Esophagus	• Focus & Identify slide of Esophagus under microscope • Illustrate histological structure of Esophagus • Write two points of identification	Should Know Must Know Must Know	P C2 C1	Skill lab	OSPE/OSCE
	M1-GIT-A-0055	Stomach	• Focus & Identify slide of Stomach under microscope • Illustrate histological structure of Stomach • Write two points of identification • Differentiate mucosa of cardiac, fundus, body and pyloric end of stomach	Should Know Must Know Must Know Must Know	P C2 C1 C2	Skill lab	OSPE/OSCE
Physiology (LGIS)	M1-GIT-P-006	Regulation of Stomach emptying	• Discuss in detail gastric factors that promote emptying and duodenal factors that inhibit emptying • Explain the role of enterogastric nervous reflexes and hormonal feedback • Recall physiological anatomy of stomach	Must know Must know Must know	C1 C1 C1	LGIS	MCQs, SAQs Viva

	M1-GIT-P-007	Motor functions of stomach	Describe motor functions of stomach in detail 1. Storage 2. Mixing and propulsion of food chyme and Hunger contractions 3. Stomach emptying 4. Role of pyloricpump	Must know	C1	LGIS	MCQs, SAQs Viva
			Discuss role of pyloricsphincter	Must know	C1		
	M1-GIT-P-008	Gastric juice-I and Digestion in stomach Physiological barrier protecting development of peptic ulcer	Describe the secretion of gastricjuice. a) Describe the basic mechanism ofHCl secretion. b) Describe the secretion and activation of pepsinogen c) Describe the secretion of intrinsic factor d) Describe the secretion of mucous and gastrin e) Describe the regulation of gastric acid and pepsinogen secretion	Must know	C1	LGIS	MCQs, SAQs Viva
			• Summarize the digestive process occurring in stomach	Must know	C2		
			• Categorized the role of gastric juice, hormones and enzymes acting in stomach	Must know	C4		
			• Discuss sites, causes and physiological factors preventing peptic ulcer	Must know	C2		
	M1-GIT-P-009	Liver & gall bladder, liver and biliary secretions	Recall physiological anatomy of liver & portal circulation	Must know	C1	LGIS	MCQs, SAQs Viva
			• Describe in detail metabolic and non-metabolic functions of liver	Must know	C2		
			• Explain the mechanism of secretion of bile.	Must know	C2		
			• Break down the functions of biliary tree.	Must know	C4		
			• Describe the composition of bil	Must know	C2		
			• Explain the role of bile in fat digestion	Must know	C2		
			• Explain the formation of gall stones	Must know	C2		
Physiology (SGD)	M1-GIT-P-0020	Gastric secretion, digestion in stomach, peptic ulcer and gastritis	• Gastric secretion and role in digestion	Must know	C1	SGD	MCQs, SAQs Viva
			• Peptic ulcer disease	Must know	C1		
			• Type of gastritis and clinical importance of gastritis	Must know	C2		
			• Investigations to diagnose gastritis	Must know	C2		
Physiology (SDL)	M1-GIT-P-0020	Gastric secretion, digestion in stomach, peptic ulcer and gastritis	• Gastric secretion and role in digestion	❖ Ganong's Review of Medical Physiology.25TH Edition. Overview of gastrointestinal function and regulation (Chapter 25, Page 453,467,472). ❖ Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. The Digestive System (Chapter 21Page 691,700)			
			• Peptic ulcer disease				
			• Type of gastritis and clinical importance of gastritis				
			• Investigations to diagnose gastritis				

				❖ 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)			
Physiology (SKL)	M1-GIT-P-0027	Examination of sense of smell	• Apparatus identification	Must Know	P	Skill lab	OSPE
			• Principle	Must Know	C1		
			• Procedure	Must Know	P		
			• Precautions	Should Know	C1		
			• Recall Olfactory pathways and abnormalities of olfaction	Must Know	C1		
Biochemistry (LGIS)	M1-GIT-B-006	Glycogen metabolism	• Explain the steps and regulation of glycogenesis and glycogenolysis	Must Know	C2	LGIS	MCQs, SAQs Viva
	M1-GIT-B-007	HMP Shunt	• Explain the pathway of HMP shunt	Must Know	C2	LGIS	MCQs, SAQs Viva
	M1-GIT-B-008	Functions of NADPH and G6PD deficiency	• Discuss uses of NADPH	Must Know	C2	LGIS	MCQs, SAQs Viva
			• How will you defend the diagnosis of a case of G6PD deficiency	Nice to Know	C5		
	M1-GIT-B-009	Citric Acid Cycle	• Describe G6PD deficiency	Must Know	C2	LGIS	MCQs, SAQs Viva
	M1-GIT-B-010	Gastric Juice	• Describe citric acid cycle	Must Know	C2	LGIS	MCQs, SAQs Viva
	M1-GIT-B-006	Glycogen metabolism	• Describe the composition, functions and related clinical disorders of gastric juice	Must Know	C2	LGIS	MCQs, SAQs Viva
Biochemistry (SGD)	M1-GIT-B-0032	Glucose 6 Phosphate Dehydrogenase Deficiency	• Discuss Glucose 6 Phosphate Dehydrogenase Deficiency	Should Know	C3	SGD	MCQs SAQs Viva
			• Create a video on symptoms, signs and biochemical diagnosis of a case of G6PD deficiency	Nice to Know	C6		
Biochemistry (SDL)	M1-GIT-B-0041	TCA Cycle & Clinical disorders related to HMP shunt	• Describe steps of TCA cycle • Discuss clinical disorders related to HMP shunt	❖ 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#13, Page 160.			
Biochemistry (SKL)	M1-GIT-B-0053	Silva-II	• Discuss the role of silva in digestion of carbohydrates	Should Know	P	Skill Lab	OSPE
			• Understand related disorder	Should Know	P		
Medicine	M1-GIT-VI(M)-001	Peptic Ulcer	• Describe Mechanism of digestion in stomach	C1		LGIS	MCQs

			• Describe Mechanism of APD and GERD	C2		
			• Discuss Peptic ulcer formation	C2		
			• Enlist Clinical features	C2		
			• Enlist Investigations	C1		

Spiral Courses (2nd Week)

Family Medicine

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(Fmed)-001	Approached to A Patient with Epigastric Pain	• Apply a systematic approach to assess epigastric pain in primary care.	C3	LGIS	MCQs
		• Analyze clinical features to distinguish major causes and develop differentials.	C4	LGIS	MCQs

Integrated Undergraduate Research Curriculum (IUGRC)

Code	Topic	Learning Objectives	Cognitive Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(IUGRC) -001	Introduction to descriptive statistics	• 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 • Describe the concept of data, variable & sources of data with respect to descriptive statistics	C1 C2 C1 C2	LGIS	MCQs

Pak Studies

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(PKS)-002	Allah SWT ki Hakmiyat ka Nifaz	• Understand the concept of Allah's Hakmiyat and its significance in Islamic teachings, emphasizing divine authority in all aspects of life.	C2	LGIS	MCQs

The Islamiyat

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(ISL)-001	Toheed Related Quranic Verses & their Explanation	• Understand the concept of Tawheed as presented in the Quran, and its significance in Islamic theology.	C2	LGIS	MCQs
		• Identify key Quranic verses related to Tawheed, focusing on the concepts of divine unity, power, and sovereignty.	C2	LGIS	MCQs
		• Identify key Quranic verses related to Risalat and explain their meanings, emphasizing the messages delivered by the Prophets.	C2	LGIS	MCQs

Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C^36) Sessions for 2nd Week

Session	Topic	Department	Education Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
\Clinico-Concept Connect (C^36) Sessions -II	Epigastric Pain & Peptic Ulcer Disease	Anatomy	Epigastric pain relates to stomach and duodenal anatomy.	• Describe gross anatomy of stomach and duodenum.	C2	MCQs
				• Identify anatomical relations of epigastric structures.	C2	MCQs
				• Explain common ulcer sites in stomach and duodenum.	C3	MCQs
		Physiology	Acid secretion and mucosal protection are key mechanisms.	• Explain regulation of gastric acid secretion.	C2	MCQs
				• Describe gastric motility and emptying.	C3	MCQs
				• Discuss mucosal defense mechanisms.	C4	MCQs
		Pathology	Ulceration results from mucosal injury and inflammation.	• Describe histopathology of peptic ulcers.	C4	MCQs
				• Explain complications such as perforation and bleeding.	C2	MCQs
				• Correlate chronic NSAID use with mucosal erosion.	C3	MCQs
		Pharmacology	Treatment depends on acid suppression and eradication therapy.	• Describe mechanism of action of PPIs and H2 blockers.	C2	MCQs
				• Explain triple therapy for H. pylori.	C5	MCQs
				• Discuss adverse effects of long-term NSAID use.	C4	MCQs
		Medicine	PUD is a common clinical disorder.	• Identify typical clinical features of ulcer pain.	C4	MCQs
				• Recognize red flags requiring urgent referral.	C5	MCQs
				• Plan stepwise evaluation of dyspepsia.	C4	MCQs
		Surgery	Complicated ulcers may require surgical intervention.	• Outline surgical emergencies: perforation, bleeding.	C3	MCQs
				• Describe basic principles of ulcer repair.	C2	MCQs
				• Recognize indications for surgery.	C3	MCQs

Theme 3: Chronic Diarrhea & Malabsorption Syndromes (3rd Week)

Theme	Rationale	Learning objectives
Chronic Diarrhea & Malabsorption Syndromes	Chronic diarrhea and malabsorption represent significant causes of morbidity and nutritional deficiencies. This theme integrates anatomy of the small intestine, physiology of digestion and absorption, and biochemical processes of nutrient metabolism with clinical disorders such as celiac disease, inflammatory bowel disease, pancreatic insufficiency, and parasitic infestations, fostering an understanding of systemic consequences and clinical correlations.	By the end of this theme, students should be able to: 1. Describe the structural adaptations of the small intestine facilitating absorption. 2. Explain the physiology of digestion and absorption of carbohydrates, proteins, fats, vitamins, and minerals. 3. Discuss the biochemical basis of nutrient metabolism and deficiencies. 4. Correlate abnormalities in absorption with clinical manifestations of chronic diarrhea. 5. Identify basic laboratory and imaging investigations used in malabsorption syndromes. 6. Appreciate the nutritional and metabolic consequences of chronic gastrointestinal disorders.

CASE 3: Chronic Diarrhea & Malabsorption Syndromes

Presenting complaints:

Chronic diarrhea and weight loss for 8 months

History of Present Illness:

A 28-year-old female presented with frequent loose, bulky, foul-smelling stools occurring 4–5 times daily. She also complained of abdominal bloating, fatigue, and weight loss. Symptoms worsened after intake of wheat-based meals. No blood in stool.

Past Medical History:

Recurrent episodes of anemia treated with iron.

Family History:

A cousin diagnosed with gluten intolerance.

Social History:

Housewife; belongs to middle socio-economic class.

Drug History:

Iron supplements intermittently.

Examination:

GPE:

Thin female, conscious and cooperative.

Pulse: 90/min BP: 110/70 mmHg

Temp: 98°F R/R: 18/min

Pallor present.

Abdominal Examination:



Soft, mildly distended abdomen; no tenderness.

Systemic Examination:

CVS, Respiratory and CNS: Normal.

Entrustable Professional Activities (EPAs)

EPA-1: Obtain a focused history for chronic diarrhea and malabsorption

• Stool characteristics, dietary triggers, weight loss, anemia, and family history.

• Entrustment level: Observation only (Level 1)

EPA-2: Perform general and abdominal examination in malabsorption

• Identify pallor, nutritional deficiency signs, abdominal distension.

• Entrustment level: Performs with supervision (Level 2)

EPA-3: Correlate intestinal structure and physiology with malabsorption

• Link villous atrophy, enzyme deficiency, and nutrient malabsorption to symptoms.

• Entrustment level: Reasoned discussion (Level 2)

EPA-4: Interpret basic investigations in malabsorption syndromes

• Explain relevance of anemia, stool fat, and serologic screening.

• Entrustment level: Guided interpretation (Level 2)

Justificaiton:



Harden Level 11 Transdisciplinary

This case of chronic diarrhea with suspected malabsorption justifies Harden Level 11 (interdisciplinary integration) as proposed by Ronald Harden, because it requires learners to integrate multiple disciplines to understand and manage a real-life clinical scenario. The presentation of bulky, foul-smelling stools, anemia, weight loss, and symptom exacerbation after wheat intake necessitates the integration of anatomy (small intestinal mucosa and villi), physiology (digestion and nutrient absorption), pathology (villous atrophy in celiac disease and other malabsorption syndromes), immunology (autoimmune response to gluten), biochemistry (nutrient deficiencies such as iron), and pharmacology/nutrition (gluten-free diet and supplementation). The case also incorporates community medicine and genetics through family history and dietary patterns, emphasizing prevention, counseling, and long-term management. By promoting clinical reasoning, holistic care, and patient education while dissolving traditional subject boundaries, this case exemplifies authentic interdisciplinary learning consistent with Level 11 integration.

Specific Learning Objectives

Subject	Code	Topic	At the end of practical students should be able to	Calgary Gauges	Learning Domain	Teaching Strategy	Assessment Tool
Anatomy Embryology	M1-GIT-A-0056	Development of Liver	• Describe formation of hepatic diverticulum	Should Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Describe histogenesis of liver during intrauterine life	Should Know	C2		
			• Describe formation of various ligaments of liver.	Should Know	C2		
			• Discuss congenital abnormalities of liver	Should Know	C3		
			• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of detoxification in the liver	Should Know	C2		
			• Analyze the embryological development of the liver foregut endoderm to explain their duct systems	Must Know	C4		
			• Correlate with the clinical conditions	Must Know	C3		
			• Understand curative and preventive heath care measures	Nice to know	C3		
			• Practice the principles of bioethetics	Nice to know	C3		
			• Apply strategic use of A.I in health care	Nice to know	C3		
			• Read relevant research articles	Nice to know	C3		
			• Use of HEC digital library	Nice to know	C3		
	M1-GIT-A-0057	Gall bladder, pancreas and Biliary apparatus	• Discuss development of Gall bladder	Should Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Describe /congenital anomalies of gall bladder	Should Know	C2		
			• Discuss development and congenital anomalies of pancreas	Should Know	C2		
			• Describe development of extrahepatic biliary apparatus and its parts with abnormalities	Should Know	C2		
			Evaluate the embryological basis of congenital anomalies of the gall bladder and pancreas	Should Know	C5		
			• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of production of bile and pancreatic vsecretions	Should Know	C2		
			• Correlate with the clinical conditions	Must Know	C3		
			• Understand curative and preventive heath care measures	Nice to know	C3		
			• Practice the principles of bioethetics	Nice to know	C3		
			• Apply strategic use of A.I in health care	Nice to know	C3		
	M1-GIT-A-0058	Development of small	• Describe development of mid gut, midgut loop and rotation of midgut loop.	Should Know	C2	LGIS	SAQ

		intestine	• Explain physiological umbilical hernia and return of mid gut to abdomen.	Should Know	C2		MCQ VIVA OSPE
			• Describe fixation of intestines and transformations in peritoneal dispositions after mid gut loop return.	Should Know	C2		
			• Describe congenital anomalies and clinical correlation of mid gut development. • Evaluate the embryological basis of congenital anomalies of the small intestine by correlating abnormal midgut development with clinical presentation and complications.	Should Know Should Know	C2 C5		
			• Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must know Nice to know Nice to know	C3 C3 C3		
Anatomy Histology	M1-GIT-A-0059	Liver	• Discuss in detail the histological organization of liver	Should Know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Explain the structure of liver lobule, portal triads& hepatic acinus and its functional importance	Should Know	C2		
			• Discuss histological features of hepatocytes.	Should Know	C2		
			• Explain Hepatic cords, central vein, portal triad, hepatic venules, hepatic arterioles, bile duct & liver sinusoids.	Should Know	C2		
			• Discuss the blood supply of the liver.	Should Know	C2		
			• Explain different cells of the liver tissue	Should Know	C2		
			• Describe clinical aspects of liver on histological grounds	Must know	C3		
			• Discuss cirrhosis, fatty liver	Must know	C2		
			• Discuss jaundice • Construct a clinico-histological correlation framework linking normal and abnormal liver histology to diagnostic, surgical, or therapeutic decision-making. • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must know Nice to know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C6 C3 C3 C3 C3		
	M1-GIT-A-0060	Pancreas & Gall Bladder	• Differentiate between exocrine and endocrine pancreas. • Discuss the cellular structure and function of exocrine pancreatic acinus and ducts. • Discuss acute & chronic pancreatitis and pancreatic	Should know Should know Should know	C2 C2 C2	LGIS	SAQ MCQ VIVA OSPE

			cancer • Explain the histological features of the gallbladder. • Discuss cholelithiasis • Evaluate histopathological changes in gall bladder, cholecystitis, gallstones) by correlating microscopic alterations with clinical signs, symptoms, and laboratory findings. • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Should know Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C2 C3 C3 C3 C5 C3 C3 C3		
	M1-GIT-A-0061	Small Intestine	• Differentiate the histological features of duodenum, jejunum and ileum • Discuss the location and function of villi, crypts of liberkuhn and microvilli in different parts of small intestine • Discuss different cells lining the epithelium of small intestine • Analyze the histological features of the small intestine to explain regional functional specialization of the duodenum, jejunum, and ileum. • • Discuss histological aspects of celiac disease and crohn disease • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Should know Should know Should know Should know Must know Nice to know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C2 C2 C2 C3 C4 C3 C3 C3 C3 C3	LGIS	SAQ MCQ VIVA OSPE
Gross Anatomy	M1-GIT-A-0062	Small Intestine (Duodenum)	• Describe the different parts ofduodenum with their anatomical differences	Should know	C2	SGD	SAQ MCQ VIVA OSPE
			• Enumerate the relations of different parts of duodenum	Should know	C1		
			• Discuss its clinical importance • Map outline of duodenum on simulated patient /model • Correlate with the clinical conditions • Understand curative and preventive heath care measures.	Must know Must know Must know Nice to know Nice to know	C2 C6 C3 C3 C3		

			• Practice the principles of bioethetics • Apply strategic use of A.I in health care	Nice to know Nice to know	C3 C3		
	M1-GIT-A-0063	Small Intestine (Jejunum and Ileum)	• Describe jejunum and ileum with their anatomical features	Should know	C2	SGD	SAQ MCQ VIVA OSPE
			• Discuss mesentery and its attachment • Evaluate the clinical and surgical significance of the small intestine's anatomical relationships to justify approaches in resections, anastomosis, and management of obstruction.	Should know Should Know	C2 C5		
			• Discuss its clinical importance • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must know Must know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3		
	M1-GIT-A-0064	Liver, Portal hypertension, Portosystemic Anastomosis	• Describe the anatomical structure of liver.	Should know	C2	SGD	SAQ MCQ VIVA OSPE
			• Describe the lobes, surfaces and segments of liver	Should know	C2		
			• Describe peritoneal reflections, ligaments and bare area of liver.	Should know	C2		
			• Enumerate visceral relations of liver.	Should know	C1		
			• Enlist the structures in porta hepatis.	Should know	C1		
			• Discuss Sub hepatic abscess & Live Biopsy	Should know	C2		
			• Discuss formation, course and parts of portal vein	Should know	C2		
			• Enumerate relations and tributaries of portal vein	Should know	C1		
			• Define portal hypertension	Must know	C1		
			• Describe sites of the portocaval anastomosis and their clinical significance	Must know	C2		
			• Explain role of portocaval shunts • Map outline of liver on simulated patient /model • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must know Must know Must know Nice to know Nice to know Nice to know	C2 C6 C3 C3 C3 C3		
Anatomy (SDL)	M1-GIT-A-0047	Crohn's Disease, Celiac Disease, Irritable Bowel	• Describe the different parts of duodenum with their anatomical differences • Enumerate the relations of different parts of duodenum • Discuss its clinical importance	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 239, 241, 244, 245, 325, 436). ❖ https://www.kenhub.com/en/library/anatomy/the-			

		Sydrome	• Anatomy of Jejunum & Ileum	digestive-system			
	M1-GIT-A-0048	Diverticulum, Intussusception	• Enlist various parts of large intestine • 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.7TH Edition. (Chapter 2, Page 227,246,248, 325). ❖ https://www.kenhub.com/en/library/anatomy/the-digestive-system			
Anatomy (SKL)	M1-GIT-A-0056	Liver, Gall bladder & Pancreas	• Focus & Identify slides of Liver, Gall bladder &Pancreas under microscope	Should Know	P	Skill labs	OSPE/OSCE
			• Illustrate histological structures of Liver, Gallbladder & Pancreas	Must Know	C2		
			• Write two points of identification	Must Know	C1		
Physiology (LGIS)	M1-GIT-P-0010	LFTs and jaundice	• Enlist liver functions test	Should know	C1	LGIS	SEQ MCQ VIVA
			• Describe liver function tests	Nice to know	C1		
			• Discuss in detail pathophysiology of jaundice	Must know	C2		
			• Compare & contrast different types of jaundice	Must know	C4		
	M1-GIT-P-0011	Cirrhosis & portal hypertension	• Describe causes and effects of cirrhosis	Must know	C1	LGIS	SEQ MCQ VIVA
			• Describe causes and effects of portal hypertension	Must know	C1		
Physiology (SGD)	M1-GIT-P-0018	Large intestine	• Recall movements and functions of large intestine	Must Know	C1	SGD	MCQs, SAQs Viva
			• Enumerate causes of empty rectum	Should Know	C1		
			• Explain defecation reflex, its importance and nervous control	Must Know	C2		
			• Classify GIT reflexes integrated at the level of gut wall, prevertebral sympathetic ganglia and spinal cord/brain stem.	Must Know	C4		
Physiology (SDL)	M1-GIT-P-0021	Small intestine motility and malabsorption (sprue, paralytic ileusand Crohn's disease)	• Factors affecting motility of small intestine • Concept of absorption of nutrients • Importance of history in diagnosis of various malabsorption diseases • Inflammatory bowel disease	❖ 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) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. Gastrointestinal Physiology. Section 12. (Chapter 64, Page 797,802)			
Physiology (SKL)	M1-GIT-P-0029	Examination of deep reflexes	• Principle	Must know	C1	Skill lab	OSPE
			• Procedure	Must know	A, P		
			• Precautions	Should know	P		
			• Recall reflex arc	Should Know	C1		

			• Recall effects of UMNL & LMNL on reflexes	Should Know	C1		
Biochemistry (LGIS)	M1-GIT-B-011	LFTs and Jaundice	• Describe types of jaundice	Must Know	C2	LGIS	MCQs, SAQs SEQs Viva
			• Understand and interpret LFTs	Must Know	C2		
			• Compare prehepatic, hepatic and post hepatic jaundice	Must Know	C4		
	M1-GIT-B-0012	Bile and Pancreatic Juice	• Describe the compositions and functions of bile and pancreatic juice	Must Know	C2	LGIS	MCQs SAQs SEQs Viva
Biochemistry (SGD)	M1-GIT-B-0033	Gluconeogenesis and its regulation	• Describe the steps and regulations of gluconeogenesis	Must Know	C2	SGD	MCQs
Biochemistry (SDL)	M1-GIT-B-0042	Glycogen Metabolism and glycogen storage diseases	• Discuss glycogen metabolism • Discuss glycogen storage disease	❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#11, Page 137-150.			
Biochemistry (SKL)	M1-GIT-B-0054	Bile	• Describe the composition and role of bile in digestion	Must Know	P	Skill Lab	OSPE
			• Understand related disorder	Should Know	P		
Radiology	M1-GIT-VI(R)-001	Medical Imaging of abdomen-I	• Identify normal and abnormal radiographs of abdomen (AP view)	C1		LGIS	MCQs
			• Identify filling defects (Barium meal and Barium enema)	C1			
			• Recognize the correct and incorrect positioning of feeding tubes	C1			
	M1-GIT-VI(R)-002	Medical Imaging of abdomen-II	• Identify normal and abnormal CT Scan MRI abdomen	C1		LGIS	MCQs
Pediatrics	M1-GIT-VI(Peads)-001	Acute and Chronic Diarrhea & Choronic Diaherrea	• Understand the diagnostic approach for both acute and chronic diarrhea, including the use of stool analysis, blood tests, and imaging when appropriate.	C2		LGIS	MCQs
			• Explain the management strategies for acute and chronic diarrhea, emphasizing fluid and electrolyte replacement, pharmacological interventions, and addressing the underlying causes.	C2			

Spiral Courses (3rd Week)

Behavioral Sciences

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(BS)-002	Learning	• 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	MCQs

Integrated Undergraduate Research Curriculum (IUGRC)

Code	Topic	Learning Objectives	Cognitive Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(IUGRC) -002	Classification of different types of data	• Classify data and types of data with examples • Enlist data types with examples in medical background • Enlist different method of data presentation (tables, graphs, diagrams, pie chart, Bar graph, histo gram. line diagram scatter diagram, statistical maps, pictogram and ogive curve) according to type of data	C2 C1 C1	LGIS	MCQs

The Islamiyat

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(ISL)-002	Toheed & Shirk	• Understand the concept of Tawheed (Oneness of Allah) and its fundamental importance in Islamic belief and practice.	C2	LGIS	MCQs
		• Explain the different types of Shirk and their theological implications in Islam.	C2	LGIS	MCQs

Pak Studies

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(PKS)-003	Two Nation Theory	• Explain the significance of the Two Nation Theory in the creation of Pakistan, emphasizing the cultural, religious, and political differences between Muslims and Hindus in the Indian subcontinent.	C2	LGIS	MCQs

Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C³6) Sessions for 3rd Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
\Clinico-Concept Connect (C³6) Sessions -III	Epigastric Pain & Peptic Ulcer Disease	Anatomy	Structure of villi explains absorption and malabsorption.	• Describe intestinal villi and absorptive surface adaptations.	C2	MCQs
				• Identify regions of nutrient absorption in small intestine.	C2	MCQs
		Physiology	Digestion and transport defects cause diarrhea and nutrient loss.	• Explain digestion and absorption of fats, proteins, carbohydrates.	C2	MCQs
				• Describe mechanisms of diarrhea.	C3	MCQs
		Pathology	Mucosal damage (e.g., Celiac disease) leads to malabsorption.	• Describe villous atrophy in celiac disease.	C4	MCQs
				• Correlate inflammation with malabsorption.	C2	MCQs
		Pharmacology	Antidiarrheals and supplements correct symptoms and deficiencies.	• Identify drugs for chronic diarrhea and supplementation.	C2	MCQs
				• Discuss vitamin replacement therapy.	C5	MCQs
		Medicine	Proper evaluation prevents complications of chronic diarrhea.	• Plan diagnostic approach for chronic diarrhea.	C2	MCQs
				• Recognize systemic consequences of malnutrition.	C5	MCQs
		Community Medicine	Addressing malnutrition burden in Pakistan improves public health outcomes.	• Discuss burden of malabsorption in Pakistan.	C5	MCQs
				• Promote dietary awareness and prevention.	C6	MCQs

Theme 4: Jaundice & Hepatobiliary Disorders (4th Week)

Theme	Rationale	Learning objectives
Jaundice & Hepatobiliary Disorders	Jaundice is a cardinal clinical sign reflecting disturbances in bilirubin metabolism and hepatobiliary function. Understanding jaundice requires integration of liver and biliary tract anatomy, physiology of bile formation and secretion, and biochemistry of bilirubin metabolism. This theme links basic sciences with clinical conditions such as hepatitis, cirrhosis, gallstones, and obstructive jaundice, enabling students to develop a structured diagnostic approach.	Students should be able to: 1. Describe the anatomy and applied anatomy of the liver, gallbladder, and biliary tree. 2. Explain the physiology of bile production, secretion, and enterohepatic circulation. 3. Discuss the biochemical pathways of bilirubin metabolism. 4. Differentiate types of jaundice based on pathophysiological mechanisms. 5. Correlate laboratory findings with clinical patterns of hepatobiliary disease. 6. Understand the role of imaging and basic interventions in hepatobiliary disorders.

CASE 4: Jaundice & Hepatobiliary Disorders

Presenting complaints:

Yellow discoloration of eyes and dark urine for 2 weeks

History of Present Illness:

A 35-year-old male presented with progressive yellowing of eyes and skin, dark-colored urine, and pale stools. He complained of generalized itching and right upper abdominal discomfort. No history of fever or hematemesis.

Past Medical History:

No known liver disease.

Family History:

Non-contributory.

Social History:

Shopkeeper; history of intravenous drug use 5 years ago.

Drug History:

No regular medication.

Examination:

GPE:

Icteric male, conscious and oriented.

Pulse: 84/min BP: 122/78 mmHg

Temp: 98.4°F R/R: 16/min

Justi

Abdominal Examination:

Mild hepatomegaly; non-tender.

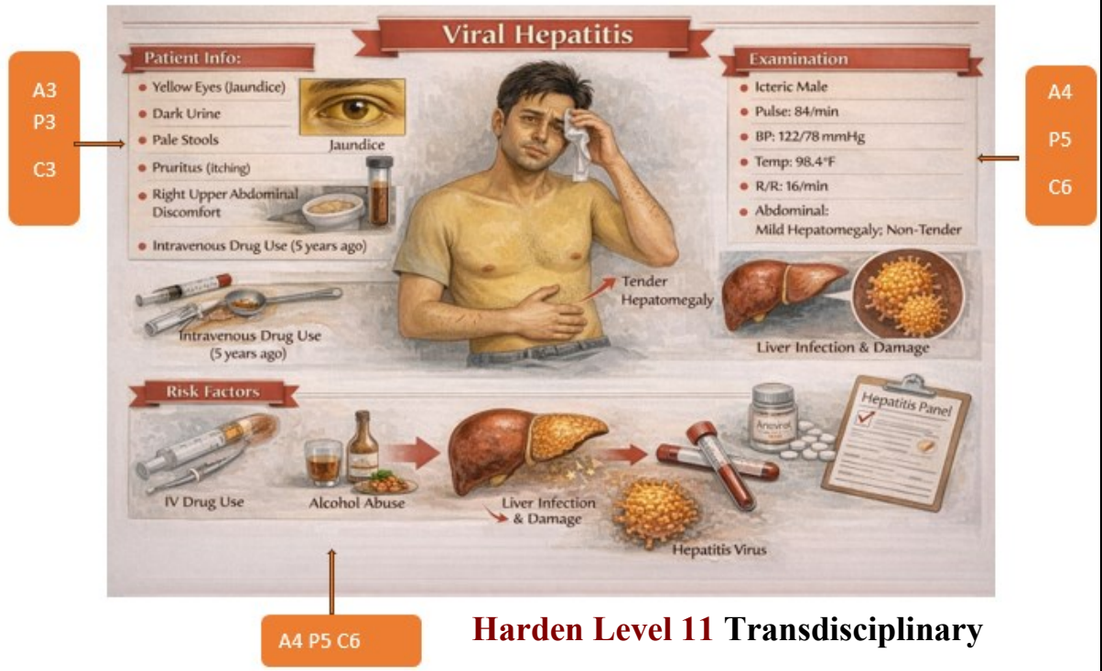
Other Systems:

CVS, Respiratory and CNS: Normal.



Entrustable Professional Activities (EPAs)

EPA-1: Elicit history in a patient presenting with jaundice
• Onset, urine/stool color changes, pruritus, risk factors (IV drug use).
• Entrustment level: Observation only (Level 1)
EPA-2: Perform focused examination in a jaundiced patient
• Detect icterus, hepatomegaly, and signs of cholestasis.
• Entrustment level: Performs with direct supervision (Level 2)
EPA-3: Differentiate types of jaundice using pathophysiology
• Pre-hepatic, hepatic, and post-hepatic mechanisms of hyperbilirubinemia.
• Entrustment level: Analytical reasoning (Level 2)
EPA-4: Interpret liver function tests and basic imaging conceptually
• Correlate bilirubin fractions, enzymes, and ultrasound findings.
• Entrustment level: Interpretation with guidance (Level



Harden Level 11 Transdisciplinary

Justification:
This case of jaundice with features suggestive of hepatobiliary disorder fits Harden Level 11 (interdisciplinary integration) because it requires learners to integrate knowledge across multiple disciplines to solve a real clinical problem rather than studying subjects in isolation. Understanding the presentation—jaundice, dark urine, pale stools, pruritus, and hepatomegaly necessitates the integration of anatomy (liver, biliary tract, and hepatocytes), physiology (bilirubin metabolism and bile secretion), pathology (hepatocellular injury vs. cholestasis), microbiology/immunology (viral hepatitis risk due to prior IV drug use), pharmacology (hepatotoxic drugs and management strategies), and clinical medicine (diagnostic approach, liver function tests, imaging, and management). Additionally, community medicine and preventive health are integrated through counseling on infection risks and lifestyle modification. By promoting clinical reasoning, holistic patient care, and application of knowledge from multiple disciplines in a single patient scenario, this case exemplifies authentic interdisciplinary learning, consistent with Level 11 integration.

Specific Learning Objectives

Subject	Code	Topic	At the end of practical students should be able to	Calgary Gauges	Learning Domain	Teaching Strategy	Assessment Tool
Anatomy Embryology	M1-GIT-A-0057	Development of large Intestine	• Enlist parts of large intestine.	Should Know	C1	LGIS	SAQ MCQ VIVA OSPE
			• Describe partitioning of cloaca and cloacal membrane.	Should Know	C2		
			• Describe development of anal canal.	Should Know	C2		
			• Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must Know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3		
Anatomy Histology	M1-GIT-A-0058	Large Intestine I (General Histological Features)	• Describe histological features of parts of large intestine. • Discuss cells lining the epithelium • Explain concept of tenaei coli. • Differentiate histological structure of the large intestine from the small intestine. • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Should know Should know Should know Should know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C2 C2 C2 C3 C3 C3 C3 C3 C3	LGIS	SAQ MCQ VIVA OSPE
Gross Anatomy	M1-GIT-A-0059	Gallbladder and Biliary apparatus	• Describe location & size of gall bladder	Should know	C2	Skill lab	SAQ MCQ VIVA OSPE/OSCE
			• Enumerate relations of gallbladder.	Should know	C1		
			• Describe clinical conditions related to gallbladder	Must know	C2		
			• Enlist different components of Extra-hepatic biliary System	Should know	C1		
			• Discuss the right & left hepatic ducts, common hepatic duct, cystic ducts, bile duct	Should know	C2		
			• Explain differences between Intra & Extra Hepatic Biliary Systems.	Should know	C2		
			• Discuss clinicals related with biliary apparatus	Must know	C2		
			• Discuss accessory hepatic ducts • Map outline of gallbladder & Bile duct on simulated patient /model	Should know Must know	C2 P+A		

			• Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must know Nice to know Nice to know Nice to know	C3 C3 C3 C3		
	M1-GIT-A-0060	Spleen	• Discuss anatomical location and features of spleen with its blood supply, and lymphatic drainage	Should know	C2	Skill lab	SAQ MCQ VIVA OSPE
			• Explain Rupture of spleen & its effects • Map outline of spleen on simulated patient /model • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must know Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 P+A C3 C3 C3 C3 C3 C3		
	M1-GIT-A-0061	Pancreas	• Recall location, shape, dimensions and extent of pancreas	Should know	C2	Skill lab	SAQ MCQ VIVA OSPE/OSCE
			• Discuss parts, ducts and relations of pancreas	Should know	C2		
			• Describe arterial supply of pancreas	Should know	C2		
			• Explain applied aspects of pancreas • Map outline of pancrease on simulated patient/ model • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must know Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 P+A C3 C3 C3 C3 C3 C3		
	M1-GIT-A-0062	Vasculature of GIT	• Describe the position and the vertebral levels of aorta in the abdomen.	Should know	C2	Skill lab	SAQ MCQ VIVA OSPE/OSCE
			• Enlist the main branches of the aorta and its territories.	Should know	C1		
			• Explain the applied anatomy of the aorta	Should know	C1		
			• Explain origin, course, branches and distribution of celiac trunk • Map outline of abdominal aorta, coeliac trunk, superior &inferior mesenteric artery on simulated patient/ model • Correlate with the clinical conditions	Should know Must know Must know Nice to know Nice to know Nice to know	C2 P+A C3 C3 C3 C3		

			• Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Nice to know Nice to know	C3 C3		
	M1-GIT-A-0063	Large Intestine & Appendix	• Enlist various parts of large intestine	Should know	C1	Skill lab	SAQ MCQ VIVA OSPE
			• Demonstrate gross anatomical features of different parts of large intestine	Should know	C2		
			• Enlist intra and retroperitoneal parts of large intestine	Should know	C1		
			• Discuss gross features of caecum	Should know	C2		
			• Describe gross anatomy of appendix	Should know	C2		
			• Enlist different anatomical positions of vermiform appendix.	Must know	C1		
			• Mark McBurney's point	Must know	P		
			• Demonstrate McBurney's incision	Must know	P		
			• Discuss common features, differential diagnosis of acute appendicitis and appendicectomy • Map outline of Transverse and descending colon on simulatrs patient /model • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must know Must know Must know Nice to know Nice to know Nice to know Nice to know	C3 P+A C3 C3 C3 C3 C3		
Anatomy (SDL)	M1-GIT-A-0049	Liver Biopsy, Liver Abscess and hepatitis	• 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.7TH Edition. (Chapter 2, Page 267-268, 272-278, 282,323, 395). ❖ https://www.kenhub.com/en/library/anatomy/the-digestive-system			
	M1-GIT-A-0050	Applied Anatomy of Vasculature of GIT (Blood Supply, Venous	• 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	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 228-233, 249-250, 263-285). ❖ http://www.anatomyzone.com 3D **anatomy**			

		drainage, Lymphatic drainage)	• Define portal hypertension • Discuss Major Lymphatic Channels				
Anatomy (SKL)	M1-GIT-A-0057	Small Intestine	• Focus & Identify slide of small intestine under microscope	Should Know	P	Skill lab	OSPE/OSCE
			• Illustrate histological structure of small intestine	Must Know	C2		
			• Write two points of identification	Must Know	C1		
Physiology (LGIS)	M1-GIT-P-0012	Physiology of pancreas Pancreatic secretions	• Describe mechanism of secretion of bicarbonate ions	Must know	C1	LGIS	MCQs, SAQs Viva
			• Describe the regulation and phases of pancreatic secretion.	Must know	C1		
			• breakdown composition of pancreatic secretions	Should know	C4		
	M1-GIT-P-0013	Motor functions of large Gut	• Defecation reflex	Must know	C1	LGIS	MCQs, SAQs Viva
			• Pathophysiology of diarrhea, constipation & ulcerative colitis	Must know	C2		
Physiology (SGD)	M1-GIT-P-0025	LFTs and jaundice	• Enlist liver functions test	Should know	C1	SGD	MCQs,
			• Describe liver function tests	Nice to know	C1		
			• Discuss in detail pathophysiology of jaundice	Must know	C2		
Physiology (SDL)	M1-GIT-P-0026	LFTs and jaundice	• Enlist liver functions test • Describe liver function tests • Discuss in detail pathophysiology of jaundice	❖ 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)				
Physiology (SKL)	M1-GIT-P-0027	Examination of superficial reflexes	• Apparatus identification	Must Know	C1	Skill lab	OSPE
			• Principle	Must Know	C1		
			• Procedure	Must Know	A, P		
			• Precautions	Should Know	P		
			• Recall reflex arc	Should Know	C1		
			• Recall effects of UMNL & LMNL on reflexes	Should Know	C1		
Biochemistry (LGIS)	M1-GIT-B-013	Nutrition -I	• Describe nutrition	Must Know	C2	LGIS	MCQs, SAQs Viva
			• Discuss various food classes	Must Know	C2		
	M1-GIT-B-014	GIT hormones and succusentericus	• Explain the GIT hormones and their functions	Must Know	C2	LGIS	MCQs, SAQs Viva
			• Describe the secretions of sucustericus and enlist their functions	Must Know	C2		
Biochemistry (SGD)	M1-GIT-B-0034	LFTs and Jaundice	• Describe types of jaundice	Should Know	C2	SGD	MCQs,
			• Understand and interpret LFTs	Should Know	C2		

			• How will you defend diagnosis of patients of prehepatic, hepatic and post hepatic jaundice	Should Know	C5		
Biochemistry (SDL)	M1-GIT-B-0043	Individual sugars	• Discuss individual sugars and their significance	❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#7,8 Page 92-119.			
	M1-GIT-B-0044	Clinical aspects of digestive juices	• Discuss clinical aspects of digestive juices				
Biochemistry (SKL)	M1-GIT-B-0055	Estimation of ALT & ALP	• Perform estimation of ALT	Must Know	P	Skill Lab	OSPE
			• Perform estimation of ALP	Must Know	P		
Surgery	M1-GIT-VI(S)-002	Gall Stones	• Identify the causes, types, and risk factors of gallstones.	C1		LGIS	MCQs
			• Understand the clinical presentation, diagnostic methods, and complications associated with gallstones.	C2			
			• Describe the management options, including medical and surgical interventions, for patients with gallstones.	C2			
Gynae & Obs	M1-GIT-VI (Gynae & Obs)-001	Jaundice/Obstetric Cholestasis in Pregnancy	• Define and classify jaundice in pregnancy, including intrahepatic cholestasis (obstetric cholestasis), viral hepatitis, and hemolytic causes.	C1		LGIS	MCQs
			• Explain the pathophysiology and clinical features of obstetric cholestasis, highlighting the role of elevated bile acids and associated maternal symptoms such as pruritus.	C2		LGIS	MCQs
			• Discuss the maternal and fetal complications, investigations, and principles of management of jaundice and obstetric cholestasis in pregnancy.	C1		LGIS	MCQs

Spiral Courses (4th Week)

Integrated Undergraduate Research Curriculum (IUGRC)

Code	Topic	Learning Objectives	Cognitive Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(IUGRC) -003	Scales of Data Measurement	• Define a scale of measurement • Classify data according to their scale of measurement • Distinguish between discrete and continuous variable	C1 C3 C2	LGIS	MCQs
M1-GIT-SI(IUGRC) -004	Measures of central tendency	• Explain concept of Measures of central tendency with illustrations form medical background • Compute and Interpret results of different measures of central tendency form a given data file • Explain concept of Measures of dispersion with illustrations form medical background • Compute and Interpret results of different measures of dispersion from a given data file	C2 C3 C1 C3	LGIS	MCQs

Family Medicine

Code	Topic	Learning Objectives	Cognitive Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(IUGRC) -003	Approch To A Patient with Hepatobiliary Disorders	•Outline a systematic clinical approach to a patient with hepatobiliary disorders, including focused history, physical examination, and appropriate interpretation of liver function tests and imaging.	C1	LGIS	MCQs
M1-GIT-SI(IUGRC) -004		•Differentiate hepatocellular, cholestatic, and obstructive patterns of liver disease to formulate a provisional diagnosis and plan further management.	C2		

Pak Studies

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(PKS)-004	Establishment of an Islamic state	• Understand the concept of an Islamic state, focusing on its foundational principles based on Islamic teachings, governance, and law.	C2	LGIS	MCQs

Islamiyat

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(ISL)-003	Risalat Related Quranic Verses & Their Explanation	• Understand the concept of Risalat in Islam, focusing on the role and responsibilities of the Prophets as conveyed in the Quran.	C2	LGIS	MCQs
		• Identify key Quranic verses related to Risalat and explain their meanings, emphasizing the messages delivered by the Prophets.	C2	LGIS	MCQs

Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C³6) Sessions for 4th Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
\Clinico-Concept Connect (C³6) Sessions -IV	Jaundice & Hepatobiliary Disorders	Anatomy	Knowledge of liver, gallbladder, and biliary tree anatomy helps localize sites of obstruction causing jaundice.	• Describe liver, gallbladder and biliary tree anatomy.	C2	MCQs
				• Identify common sites of obstruction.	C2	MCQs
		Physiology	Understanding bile formation and enterohepatic circulation explains mechanisms of cholestasis.	• Explain bile formation and enterohepatic circulation.	C2	MCQs
		Biochemistry	Bilirubin metabolism clarifies the basis of conjugated and unconjugated hyperbilirubinemia.	• Describe bilirubin conjugation and excretion pathways	C4	MCQs
		Pathology	Differentiating hepatocellular and obstructive injury patterns guides diagnosis and management.	• Differentiate hepatocellular vs obstructive patterns of injury.	C2	MCQs
		Pharmacology	Overview of drugs for hepatitis and cholestasis supports rational therapeutic decisions.	• Outline drugs used in hepatitis and cholestasis (overview).	C2	MCQs
		Medicine	Interpreting LFT patterns enables early recognition of severe jaundice and urgent complications.	• Interpret LFT patterns in jaundice.	C5	MCQs
				• Recognize red flags requiring urgent care.	C5	MCQs
		Community Medicine	Addressing hepatitis burden in Pakistan emphasizes vaccination and harm-reduction strategies.	• Discuss hepatitis burden in Pakistan.	C5	MCQs
				• Promote vaccination and harm-reduction strategies.	C6	MCQs

Theme 5: Acute Abdomen & Large Intestinal Disorders (5th Week)

Theme	Rationale	Learning objectives
Acute Abdomen & Large Intestinal Disorders	Acute abdominal pain is a medical and surgical emergency requiring rapid assessment and decision-making. This theme integrates anatomy of the large intestine and peritoneum, physiology of colonic motility and absorption, and biochemical aspects of fluid and electrolyte balance with clinical entities such as appendicitis, intestinal obstruction, inflammatory and ischemic colonic disorders, emphasizing clinical reasoning and early recognition.	At the completion of this theme, students should be able to: 1. Describe the anatomy and surface anatomy of the large intestine and peritoneal cavity. 2. Explain the physiological functions of the colon, including water and electrolyte absorption. 3. Discuss the biochemical basis of fluid, electrolyte, and acid–base disturbances in acute abdominal conditions. 4. Correlate anatomical and physiological derangements with clinical features of acute abdomen. 5. Understand the principles of initial evaluation, including clinical examination and basic investigations. 6. Appreciate the integration of medical and surgical perspectives in managing acute gastrointestinal emergencies.

CASE 5: Acute Abdomen & Large Intestinal Disorders

Presenting complaints:
Severe abdominal pain and vomiting for 12 hours

History of Present Illness:
A 22-year-old male presented to emergency with severe pain starting around the umbilicus and later shifting to the right lower abdomen. Pain was associated with nausea and vomiting. He also complained of low-grade fever and loss of appetite.

Past Medical History:
No known illness.

Family History:
Non-contributory.

Social History:
University student; hostel resident.

Drug History:
No drug intake.

Examination:

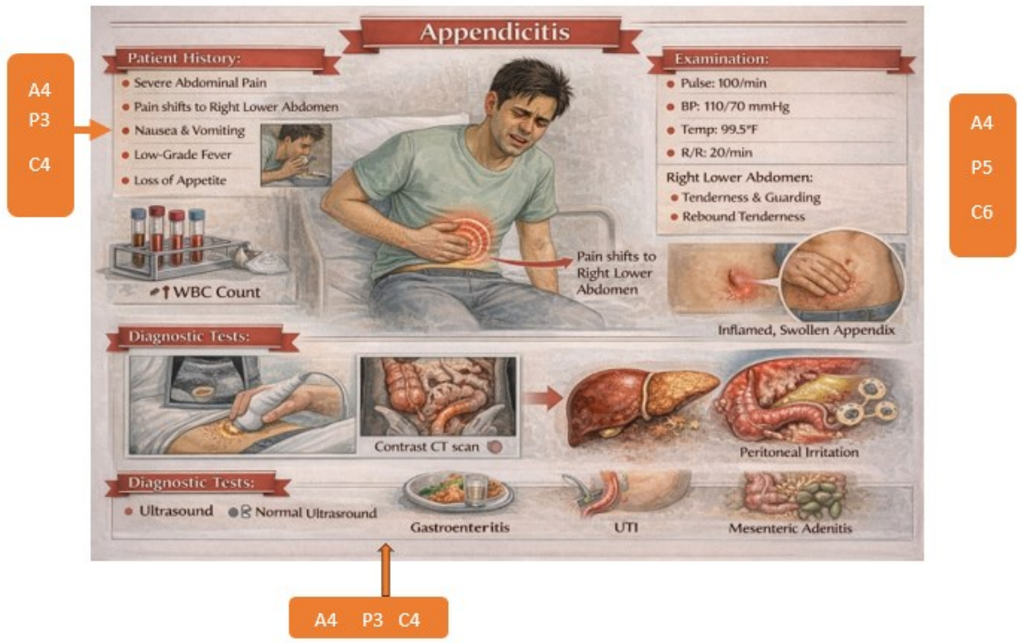
GPE:
Young male in pain, conscious and oriented.
Pulse: 100/min BP: 110/70 mmHg
Temp: 99.5°F R/R: 20/min



Abdominal Examination:
Tenderness and guarding in right iliac fossa; rebound tenderness present.

Other Systems:
CVS, Respiratory and CNS: Normal.

Theme 5 Clinico-concept connect ($C^3$6) Sessions



Harden Level 11 Transdisciplinary

Entrustable Professional Activities (EPAs)

EPA-1: Rapidly obtain focused history in acute abdominal pain
• Pain migration, associated vomiting, fever, and anorexia.
• Entrustment level: Observation only (Level 1)

EPA-2: Perform systematic abdominal examination in acute abdomen
• Identify guarding, rigidity, rebound tenderness.
• Entrustment level: Performs with close supervision (Level 2)

EPA-3: Correlate anatomy and physiology with acute abdominal pathology
• Explain basis of referred pain and localized peritoneal irritation.
• Entrustment level: Reasoned discussion (Level 2)

EPA-4: Recognize need for urgent referral and multidisciplinary care
• Understand urgency of surgical evaluation in suspected appendicitis.
• Entrustment level: Awareness and escalation (Level 2)

Justification:
This case of acute abdominal pain with features suggestive of acute appendicitis justifies Harden Level 11 (interdisciplinary integration) because it requires learners to apply knowledge from multiple disciplines in a real clinical context rather than in isolation. The presentation—peri-umbilical pain migrating to the right iliac fossa, nausea, vomiting, low-grade fever, and localized tenderness with rebound—necessitates integration of anatomy (appendix, peritoneum, and gastrointestinal tract), physiology (inflammatory response, pain pathways, gastrointestinal motility), pathology (appendiceal inflammation, possible perforation), microbiology (bacterial involvement in infection), pharmacology (analgesics, antibiotics), and clinical medicine/surgery (diagnosis, surgical management, and perioperative care). Additionally, public health and patient counseling are incorporated through early recognition of warning signs and timely referral. By requiring students to synthesize these disciplines for clinical reasoning, decision-making, and holistic patient management in a time-sensitive scenario, this case exemplifies authentic interdisciplinary learning consistent with Harden Level 11.

Specific Learning Objectives

Subject	Code	Topic	At the end of practical students should be able to	Calgary Gauges	Learning Domain	Teaching Strategy	Assessment Tool
Anatomy Embryology	M1-GIT-A-0058	Development of Body cavities I & II	• Enumerate different body cavities	Should Know	C1	LGIS	SAQ MCQ VIVA OSPE
			• Describe division of embryonic body cavity	Should Know	C2		
			• Discuss formation and significance of pleuropericardial membranes and pleuroperitoneal membranes	Should Know	C2		
			• Describe muscular ingrowth from Lateral body walls	Should Know	C2		
			• Correlate with the clinical conditions	Must Know	C3		
			• Understand curative and preventive heath care measures	Nice to know	C3		
			• Practice the principles of bioethetics	Nice to know	C3		
			• Apply strategic use of A.I in health care measures.	Nice to know	C3		
Anatomy Histology	M1-GIT-A-0059	Large Intestine II (Histological features of different parts)	• Describe histological features of appendix, caecum, rectum and anal canal	Should know	C2	LGIS	SAQ MCQ VIVA OSPE
			• Discuss clinical conditions (Colorectal cancer)	Must know	C3		
			• Correlate with the clinical conditions	Must know	C3		
			• Understand curative and preventive heath care measures.	Nice to know	C3		
			• Practice the principles of bioethetics	Nice to know	C3		
			• Apply strategic use of A.I in health care	Nice to know	C3		
Gross Anatomy	M1-GIT-A-0060	Nerve supply and Lymphatic drainage of GIT	• Discus enteric nervous system with formation of plexuses and its parasympathetic role	Should know	C2	Skill lab	SAQ MCQ VIVA OSPE
			• Enlist the types of lymph nodes draining the abdomen	Should know	C1		
			• Describe lymphatic drainage of GIT with special reference to lymphatic trunks, cisterna chyli & the thoracic duct	Should know	C2		
			• Correlate with the clinical conditions	Must know	C3		
			• Understand curative and preventive heath care measures.	Nice to know	C3		
			• Practice the principles of bioethetics	Nice to know	C3		
			• Apply strategic use of A.I in health care	Nice to know	C3		
				Nice to know	C3		
	M1-GIT-A-0061	Cross Sectional Anatomy	• Identify different visceras located at different levels of vertebral coloumn; T10, T11,T12,L1,L2	Should know	C1	Skill lab	SAQ MCQ VIVA OSPE
			• Correlate with the clinical conditions	Must Know	C3		
			• Understand curative and preventive heath care measures.	Nice to know	C3		
				Nice to know	C3		
				Nice to know	C3		

			• Practice the principles of bioethetics • Apply strategic use of A.I in health care	Nice to know	C3		
	M1-GIT-A-0062	Rectum	• Discuss the location and extent of rectum	Should know	C2	Skill lab	SCQ MCQ VIVA OSPE
			• Describe the internal and external features of rectum	Should know	C2		
			• Discuss peritoneal reflections rectouterine, rectovesical fossae and their clinical significance	Should know	C2		
			• Enumerate relations of rectum	Should know	C1		
			• Discuss blood supply, nerve supply, venous and lymphatic drainage	Should know	C1		
			• Describe the basis and features of rectal prolapsed • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3		
	M1-GIT-A-0063	Anal canal	• Discuss location and extent of anal canal	Should know	C2	Skill lab	SAQ MCQ VIVA OSPE
			• Describe external and internal features of Anal Canal	Should know	C2		
			• Discuss features of anal sphincters	Should know	C2		
			• Tabulate relations of the anal canal with the surrounding structures	Should know	C2		
			• Describe the Blood supply, venous and lymphatic drainage & innervations of anal canal	Should know	C2		
			• Discuss anal continence	Should know	C2		
			• Differentiate between internal and external haemorrhoids • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care	Must know Must know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3		
	M1-GIT-A-0064	Radiological Anatomy	• Identify structures on a normal X-ray abdomen • Appreciate Air fluid shadows. • Mark anatomical landmarks. • Correlate the clinical conditions • Understand the preventive and curative health care measures	Should know Should know Should know Should know Nice to know Nice to know	C2 C2 C2 C3 C3 C3	Skill lab	OSPE

			• Practice the principles of Bioethics • Apply Strategic use of AI in health care	Nice to know Nice to know	C3 C3		
Anatomy (SDL)	M1-GIT-A-0065	Hemorrhoids & Anal Fissure	• 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.7TH Edition. (Chapter 2, Page 239, 248,253 368-371,436,438). ❖ http://www.anatomyzone.com 3D **anatomy**			
	M1-GIT-A-0066	Applied Anatomy of Innervation of Abdominal Viscera's	• Discuss cutaneous & Somatic innervation of GIT • Describe Autonomic innervation of GIT	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 301-305). ❖ http://www.anatomyzone.com 3D **anatomy**			
Anatomy (SKL)	M1-GIT-A-0058	Large Intestine	• Focus & Identify slide of Large Intestine under microscope	Should Know	P	Skill lab	OSPE/OSCE
			• Illustrate histological structure of large intestine	Must Know	C2		
			• Write two points of identification	Must Know	C1		
Physiology (SGD)	M1-GIT-P-0028	Acute Abdomen & Large Intestinal Disorders	• Define acute abdomen & identify its common cause	Must Know	C1	SGD	MCQs
			• Identify its common large gut disorders	Must Know	C1		
	M1-GIT-P-0025	Acute Abdomen & Large Intestinal Disorders	• Define acute abdomen & identify its common cause • identify its common large gut disorders	❖ 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)			
Physiology (SKL)	M1-GIT-P-0029	Examination of deep reflexes	• Principle	Must know	C1	Skill lab	OSPE
			• Procedure	Must know	A, P		
			• Precautions	Should know	P		
			• Recall reflex arc	Should Know	C1		
			• Recall effects of UMNL & LMNL on reflexes	Should Know	C1		
Biochemistry (LGIS)	M1-GIT-B-015	Digestion and absorption-I	• Understand the digestion and absorption of carbohydrates	Should Know	C2	LGIS	MCQs, SAQs Viva
			• Discuss glucose entry into the cells	Should Know	C2		
	M1-GIT-B-016	Digestion and absorption-II	• Describe the digestion and absorption of proteins and lipids	Should Know	C2	LGIS	MCQs, SAQs Viva
			• Discuss clinical disorders related to digestion & absorption	Should Know	C2		
	M1-GIT-B-017	Nutrition-II	• Discuss BMR and BMI and their calculations	Should Know	C2	LGIS	MCQs, SAQs Viva
	M1-GIT-B-018	Nutrition-III	• Discuss clinical disorders related to nutrition	Should Know	C2	LGIS	MCQs, SAQs SEQs Viva
			• Create a video on protein calorie malnutrition in children	Should Know	C6		
Biochemistry (SGD)	M1-GIT-B-0035	Lactose intolerance	• Discuss lactose intolerance and dietary modifications required during its treatment	Should Know	C2	SGD	MCQs
Biochemistry (SDL)	M1-GIT-B-0045	Lipid digestion and absorption	• Discuss digestion and absorption of lipids	❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#15, Page 191-200.			
	M1-GIT-B-0046	Clinical disorders related to digestion and absorption	• Understand the clinical disorders related to digestion and absorption	❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#15, Page 191-200.			
Biochemistry (SKL)	M1-GIT-B-0056	Analysis of Food Component (Wheat)	• Analyze the different constituents of wheat	Must Know	P	SKL	OSPE
Medicine	M1-GIT-VI(M)-003	Inflammatory Bowel Diseases	• Describe features of IBD	C2		LGIS	MCQs
			• Classify IBD	C2			
			• Describe pathogenesis of IBD	C2			
			• Describe histological diagnosis of IBD	C1			
			• Enlist complication of IBD	C1			

Pharmcaology	M1-GIT-VI(Pharm)-001	Anti Diarrheal Drugs	• Classify the antidiarrheal drugs	C1	LGIS	MCQs
			• Describe the mechanism of action and clinical uses of antidiarrheal drugs	C2		
			• Describe the adverse effects and contraindications ofthese drugs	C2		
Pathology	M1-GIT-VI(Path)-001	Pathologies of Intestine	• Understand the normal structure and function of the intestine, and how these are altered in disease states.	C1	LGIS	MCQs
			• Explain the pathophysiology of common intestinal disorders, including infections, inflammations, and neoplasms.	C2		
			• Identify the clinical features and diagnostic approaches for inflammatory bowel diseases, intestinal infections, and tumors.	C2		
Surgery	M1-GIT-VI(S)-002	Acute Abdomen	• Identify the clinical features of acute abdomen, including its presentation, common causes, and potential complications.	C1	LGIS	MCQs
			• Describe the role of laboratory investigations, imaging studies (such as ultrasound and CT scan)	C2		
			• Describe the general principles of management of acute abdomen	C2		
Community Medicine	M1-GIT-SI(IUGRC) -005	Geriatrics	• Differentiate between geriatrics and gerontology • Explain the public health importance of geriatrics • Enlist common health and other problems related to old age • Recommend preventive, rehabilitative measures for older age health problems • Appreciate the role of health physicians in giving health advise to elderly	C2 C2 C1 C2 C1	LGIS	MCQs

Spiral Courses (5th Week)

Behavioral Sciences

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(BS)-003	Memory	• 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	MCQs

Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C³6) Sessions for 5th Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
\Clinico-Concept Connect (C³6) Sessions -V	Acute Abdomen & Large Intestinal Disorders	Anatomy	Understanding appendix location and McBurney's point explains pain migration and aids early diagnosis of appendicitis.	• Describe appendix location and peritoneal relations.	C2	MCQs
				• Explain McBurney's point and pain migration.	C2	MCQs
		Physiology	Knowledge of colonic motility and fluid absorption clarifies symptoms like pain and altered bowel habits.	• Discuss colonic motility and fluid absorption.	C2	MCQs
		Pathology	Acute inflammation and risk of perforation explain complications of appendicitis.	• Describe acute inflammation and complications (perforation).	C3	MCQs
		Pharmacology	Appropriate antibiotics and cautious analgesic use improve outcomes in acute appendicitis.	• Identify antibiotics used in acute appendicitis.	C2	MCQs
				• Discuss analgesic use in acute abdomen.	C3	MCQs
		Surgery	Principles of emergency appendectomy highlight timely intervention to prevent morbidity.	• Outline appendectomy and emergency surgical principles.	C6	MCQs
		Community Medicine	Early hospital presentation and reducing access barriers lower complications and mortality from acute appendicitis.	• Discuss importance of early hospital presentation.	C5	MCQs
				• Address barriers in emergency healthcare access.	C6	MCQs

Anatomy LGIS Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the end of lecture students should be able to	Calgary Gauge	Learning Domain	References
		Embryology			
M1-GIT-A-0059	Development of Tongue	• Describe the development of pharyngeal apparatus	Should Know	C2	• **Embryology:** - KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024
		• Enlist the sources for development of different parts of tongue.	Should Know	C1	
		• Explain the development of tongue along with its nerve supply.	Should Know	C2	
		• Describe the congenital anomalies associated with tongue	Must Know	C2	
		• Describe the developmental basis of physiological and biochemical mechanisms involved in perception and transmission of taste sensation	Should Know	C2	
		• Correlate with the clinical conditions	Must Know	C3	
		• Understand curative and preventive heath care measures	Nice to know	C3	
		• Practice the principles of bioethetics	Nice to know	C3	
		• Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Nice to know	C3 C3 C3	
M1-GIT-A-0060	Development of Body cavities I & II	• Enumerate different body cavities	Should Know	C1	• **Embryology:** - KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024
		• Describe division of embryonic body cavity	Should Know	C2	
		• Discuss formation and significance of pleuropericardial membranes and pleuroperitoneal membranes	Should Know	C2	
		• Describe muscular ingrowth from Lateral body walls	Should Know	C2	
		• Correlate with the clinical conditions	Must Know	C3	
		• Understand curative and preventive heath care measures	Nice to know	C3	
		• Practice the principles of bioethetics	Nice to know	C3	
		• Apply strategic use of A.I in health care measures. • Read relevant research articles. • Use HEC digital library	Nice to know	C3 C3 C3	
M1-GIT-A-0061	Development of Salivary glands	• Explain different stages of development of salivary glands	Should Know	C2	• **Embryology:**- KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1**
		• Enlist the sourse for development of different type of salivary gland	Should Know	C1	
		• Explain development of its nerve supply	Should Know	C2	
		• Describe the congenital anomalies associated with	Should Know	C2	

		salivary glands			(Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024 • **Embryology:** - KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1** (Volume 1) 2023-2034
		• Correlate with the clinical conditions	Must Know	C3	
		• Understand curative and preventive heath care measures	Nice to know	C3	
		• Practice the principles of bioethetics		C3	
		• Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library		C3 C3 C3	
M1-GIT-A-0062	Development of Esophagus	• Discuss the formation of tracheoesophageal septum and its importance	Should Know	C2	• **Embryology:** - KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024
		• Describe salient features of esophageal development	Should Know	C2	
		• Describe congenital anomalies of esophagus	Should Know	C2	
		• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of swallowing	Should Know	C2	
		• Correlate with the clinical conditions	Must Know	C3	
		• Understand curative and preventive heath care measures	Nice to know	C3	
		• Practice the principles of bioethetics	Nice to know	C3	
		• Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library	Nice to know	C3	
M1-GIT-A-0063	Development of Stomach	• Explain the development of stomach	Should Know	C2	• **Embryology:**- KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024
		• Discuss rotations and positional shifts of stomach & their effect on nerve supply and peritoneal attachments	Should Know	C2	
		• Explain formation of omental bursa.	Should Know	C2	
		• Describe congenital anomalies of stomach	Should Know	C2	
		• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of digestion in the stomach • Discuss pernicious anemia	Should Know	C2 C2	
		• Correlate with the clinical conditions	Must Know	C3	
		• Understand curative and preventive heath care measures	Nice to know	C3	
		• Practice the principles of bioethetics	Nice to know	C3	
		• Apply strategic use of A.I in health care	Nice to know	C3	

		• Read relevant research articles	Nice to know	C3	
		• Use of HEC digital library	Nice to know	C3	
M1-GIT-A-0064	Development of Liver	• Describe formation of hepatic diverticulum	Should Know	C2	• **Embryology:** - KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024
		• Describe histogenesis of liver during intrauterine life	Should Know	C2	
		• Describe formation of various ligaments of liver.	Should Know	C2	
		• Discuss congenital abnormalities of liver	Should Know	C3	
		• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of detoxification in the liver	Should Know	C2	
		• Correlate with the clinical conditions	Must Know	C3	
		• Understand curative and preventive heath care measures	Nice to know	C3	
		• Practice the principles of bioethetics	Nice to know	C3	
		• Apply strategic use of A.I in health care	Nice to know	C3	
		• Read relevant research articles	Nice to know	C3	
		• Use of HEC digital library	Nice to know	C3	
M1-GIT-A-0065	Gall bladder, pancreas and Biliary apparatus	• Discuss development of Gall bladder	Should Know	C2	• **Embryology:** - KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024
		• Describe /congenital anomalies of gall bladder	Should Know	C2	
		• Discuss development and congenital anomalies of pancreas	Should Know	C2	
		• Describe development of extrahepatic biliary apparatus and its parts with abnormalities	Should Know	C2	
		• Describe the developmental basis for the physiological and biochemical mechanisms involved in the process of production of bile and pancreatic vsecretions	Should Know	C2	
		• Correlate with the clinical conditions	Must Know	C3	
		• Understand curative and preventive heath care measures	Nice to know	C3	
		• Practice the principles of bioethetics	Nice to know	C3	
		• Apply strategic use of A.I in health care	Nice to know	C3	
		• Read relevant research articles	Nice to know	C3	
		• Use of HEC digital library	Nice to know	C3	
M1-GIT-A-0066	Development of small	• Describe development of mid gut, midgut loop and rotation of midgut loop.	Should Know	C2	• **Embryology:**- KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1** (Volume 1) 2023-2034
		• Explain physiological umbilical hernia and return of mid gut to abdomen.	Should Know	C2	
		• Describe fixation of intestines and transformations in	Should Know	C2	

	intestine	peritoneal dispositions after mid gut loop return.			•
		• Describe congenital anomalies and clinical correlation of mid gut development.	Should Know	C2	**UWORLD Step 1** (Volume 3) 2023-2024
		• Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3	
M1-GIT-A-0067	Development of large intestine	• Enlist parts of large intestine.	Should Know	C1	• **Embryology:** - KLM Embryology Developing Human 11th Edition • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024
		• Describe partitioning of cloaca and cloacal membrane.	Should Know	C2	
		• Describe development of anal canal.	Should Know	C2	
		• Describe congenital anomalies of large intestine. • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Should Know Must Know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0068	Tongue	• Discuss surfaces of tongue with their histological features	Should Know	C2	• **Histology: -**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024 •
		• Describe different papillae of tongue with their location & features	Should Know	C2	
		• Explain histological features of taste buds	Should Know	C2	
		• Discuss leukoplakia and oral thrush • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Must Know Must Know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	
		• Enlist major salivary glands	Should Know	C1	• **Histology: -**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034
		• Explain histological structure of salivary glands	Should Know	C2	
		• Discuss different cells forming parenchyma of salivary	Should Know	C2	

M1-GIT-A-0069	Salivary glands	glands			• **UWORLD Step 1** (Volume 3) 2023-2024 •
		• Discuss histology of duct system	Should Know	C2	
		• Differentiate between major salivary glands on histological basis	Should Know	C2	
		• Discuss effects of viral infections on salivary glands • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Must Know Must Know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0070	General organization of GIT	• Describe the developmental basis of physiological and biochemical mechanisms involved in perception and transmission of taste sensation	Should Know	C2	• **Histology: -**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024 •
		• Describe the histological characteristics of each layer with functional significance	Should Know	C2	
		• Discuss associated clinicals (megacolon, chagas disease) • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Must Know Must Know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0071	Esophagus	• Describe the histological layers of esophagus.	Should Know	C2	• **Histology: -**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024 •
		• Compare between various portions of esophagus histologically.	Should Know	C2	
		• Discuss GERD • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Must Know Must Know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	
		• Describe the histological layers of different parts of stomach	Should Know	C2	• **Histology: -**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034
		• Describe histological differences of different parts of the gastric glands	Should Know	C2	

M1-GIT-A-0072	Stomach	• Describe the structure and function of different cells of gastric glands	Should Know	C2	• **UWORLD Step 1** (Volume 3) 2023-2024 •
		• Explain clinical conditions associated with stomach histologically	Must know	C2	
		• Discuss pernicious anemia • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0073	Liver	• Discuss in detail the histological organization of liver	Should Know	C2	• **Histology: -**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024 •
		• Explain the structure of liver lobule, portal triads& hepatic acinus and its functional importance	Should Know	C2	
		• Discuss histological features of hepatocytes.	Should Know	C2	
		• Explain Hepatic cords, central vein, portal triad, hepatic venules, hepatic arterioles, bile duct & liver sinusoids.	Should Know	C2	
		• Discuss the blood supply of the liver.	Should Know	C2	
		• Explain different cells of the liver tissue	Should Know	C2	
		• Describe clinical aspects of liver on histological grounds	Must know	C3	
		• Discuss cirrhosis, fatty liver	Must know	C2	
		• Discuss jaundice • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Must know Nice to know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0074	Pancreas & Gall Bladder	• Differentiate between exocrine and endocrine pancreas. • Discuss the cellular structure and function of exocrine pancreatic acinus and ducts. • Discuss acute & chronic pancreatitis and pancreatic cancer • Explain the histological features of the gallbladder. • Discuss cholelithiasis • Correlate with the clinical conditions	Should know Should know Should know Should know Must know Must know Nice to know	C2 C2 C2 C2 C2 C3 C3	• **Histology: -**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024 •

		• Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3	
M1-GIT-A-0075	Small Intestine	• Differentiate the histological features of duodenum, jejunum and ileum • Discuss the location and function of villi, crypts of liberkuhn and microvilli in different parts of small intestine • Discuss different cells lining the epithelium of small intestine • Discuss histological aspects of celiac disease and crohn disease • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Should know Should know Should know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C2 C2 C2 C3 C3 C3 C3 C3 C3	• **Histology: -**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024 •
M1-GIT-A-0076	Large Intestine I (General Histological Features)	• Describe histological features of parts of large intestine. • Discuss cells lining the epithelium • Explain concept of tenaei coli. • Differentiate histological structure of the large intestine from the small intestine. • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Should know Should know Should know Should know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C2 C2 C2 C3 C3 C3 C3 C3 C3	• **Histology :-**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024 •
M1-GIT-A-0077	Large Intestine II (Histological Features of different parts)	• Describe histological features of appendix, caecum, rectum and anal canal • Discuss clinical conditions (Colorectal cancer) • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles	Should know Must know Must know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	• **Histology :-**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034 • **UWORLD Step 1** (Volume 3) 2023-2024 •

		• Use HEC digital library	Nice to know	C3	

Anatomy SGDs Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives Students Should Be Able To	Importance	C/P/A	
M1-GIT-A-0078	Topographical organization of Gastrointestinal tract	• Enlist components of gastrointestinal tract	Should know	C1	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Mark the planes dividing the abdomen into nine quadrants	Must know	P	
		• Enumerate the parts of GIT lying in the various quadrants • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C1 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0079	Oral Cavity, tongue and salivary glands,	• Define the boundaries of oral cavity	Should know	C1	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Tabulate the Extrinsic and Intrinsic muscles of the tongue, anatomical location and clinical importance of tongue	Should know	C2	
		• Brief Introduction of salivary glands with their anatomical location • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics	Should know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C1 C3 C3 C3 C3 C3 C3	

		• Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library			
M1-GIT-A-0080	Anterolateral abdominal wall	• Explain the layers of abdominal wall.	Should know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 183,184-216). https://3d4medical.com/
		• Explain the fascia and muscles of abdominal wall.	Should know	C2	
		• Describe nerve supply of anterior and lateral abdominal wall.	Should know	C2	
		• Explain the segmental sympathetic supplies	Should know	C2	
		• Correlate the Anatomical knowledge with Abdominal Hernias • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0081	Rectus sheath,	• Describe Formation of rectus sheath	Should know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 188-201). https://teachmeanatomy.info/
		• Enlist contents of rectus sheath	Should know	C1	
		• Discuss associated clinical anatomy • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of	Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	

		bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library			
M1-GIT-A-0082	Inguinal Region & Inguinal Hernias	• Describe Walls of Inguinal Canal	Should know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 197, 202-203, 212-213). ❖ https://3d4medical.com/
		• Explain Deep & Superficial Inguinal Ring	Should know	C2	
		• Enumerate Structures passing through the inguinal canal	Should know	C1	
		• Enlist Coverings of spermatic cord	Should know	C1	
		• Explain Mechanics of the inguinal Canal	Should know	C2	
		• Describe boundaries of Hassalbachs triangle	Should know	C2	
		• Define hernia	Must know	C1	
		• Differentiate indirect from direct inguinal hernia • Map outline of inguinal canal on simulated patient /model • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 P+A C3 C3 C3 C3 C3 C3	
M1-GIT-A-0083	Testes, scrotum	• Define Anatomy of Testes and Scrotum	Should know	C1	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Differentiate between Protective Coverings of Testes & scrotum	Should know	C2	
		• Enumerate Nerve & blood supply of these Structures	Should know	C1	
		• Discuss the parts of epididymis	Should know	C2	
		• Discuss Spermatocoele,	Must know	C2	

		Varicocoele, Hematocoele, hydrocoele, Testicular torsion • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Nice to know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0084	Peritoneum & Peritoneal Cavity	• Define peritoneum	Should know	C1	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 219-221,). https://teachmeanatomy.info/
		• Explain the different folds of peritoneum.	Should know	C2	
		• Describe greater and lesser sacs	Should know	C2	
		• Enlist the intra and retroperitoneal viscera	Should know	C1	
		• Discuss vertical tracings of peritoneum • Correlate with the clinical conditions • Understand curative and preventive heath 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	Should know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	
		• Describe arrangement of peritoneum in transverse & Longitudinal section of abdomen	Should know	C2	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034
		• Describe arrangement of peritoneum in transverse section of	Should know	C2	

M1-GIT-A-0085	Subdivisons of Peritoneal Cavity	male pelvis			**UWORLD Step 1** (Volume 3) 2023-2024
		• Explain arrangement of peritoneum in transverse section of female pelvis	Should know	C2	
		• Explain the layers, folds, recesses and compartments of peritoneum with their clinical importance	Should know	C2	
		• Describe peritonitis	Must know	C3	
		• Enumerate the signs and symptoms of peritonitis	Must know	C3	
		• Treat peritonitis by antibiotics and peritoneal dialysis • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0086	Esophagus	• Discuss gross features of abdominal part of esophagus	Should know	C2	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Enumerate their peritoneal & visceral relations.	Should know	C1	
		• Explain blood supply, lymphatic drainage & nerve supply of esophagus	Should know	C2	
		• Discuss Esophageal varices • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics	Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	

		• Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library			
M1-GIT-A-0087	Stomach	• Explain gross features of stomach.	Should know	C2	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Discuss blood supply, lymphatic drainage & nerve supply of stomach	Should know	C2	
		• Explain peritoneal & visceral relations of stomach	Should know	C2	
		• Discuss greater and lesser omentum	Should know	C2	
		• Describe formation and boundaries of epiploic foramen • Map outline of stomach on simulated patient /model • Correlate with the clinical conditions • Understand curative and preventive heath 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	Should know Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 P+A C3 C3 C3 C3 C3 C3	
M1-GIT-A-0088	Small Intestine (Duodenum)	• Describe the different parts ofduodenum with their anatomical differences	Should know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 239, 241, 244, 245, 325, 436). https://www.kenhub.com/en/library/anatomy/the-digestive-system
		• Enumerate the relations of different parts of duodenum	Should know	C1	
		• Discuss its clinical importance • Map outline of duodenum on simulated patient /model • Correlate with the clinical conditions • Understand curative and	Must know Must know Must know Nice to know Nice to know Nice to know	C2 P+A C3 C3 C3 C3	

		preventive heath 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	Nice to know Nice to know	C3 C3	
M1-GIT-A-0089	Small Intestine (Jejunum and Ileum)	• Describe jejunum and ileum with their anatomical features	Should know	C2	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Discuss mesentery and its attachment	Should know	C2	
		• Discuss its clinical importance • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	
M1-GIT-A-0090	Large Intestine & Appendix	• Enlist various parts of large intestine	Should know	C1	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 227,246,248, 325). https://www.kenhub.com/en/library/anatomy/the-digestive-system
		• Demonstrate gross anatomical features of different parts of large intestine	Should know	C2	
		• Enlist intra and retroperitoneal parts of large intestine	Should know	C1	
		• Discuss gross features of caecum	Should know	C2	
		• Describe gross anatomy of appendix	Should know	C2	
		• Enlist different anatomical positions of vermiform appendix.	Must know	C1	
		• Mark McBurney’s point	Must know	P	
		• Demonstrate McBurney’s incision	Must know	P	
		• Discuss common features,	Must know	C3	

		differential diagnosis of acute appendicitis and appendicectomy • Map outline of Transverse and descending colon on simulatrs patient /model • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	P+A C3 C3 C3 C3 C3 C3	
M1-GIT-A-0091	Liver, Portal hypertension, Portosystemic Anastomosis	• Describe the anatomical structure of liver.	Should know	C2	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Describe the lobes, surfaces and segments of liver	Should know	C2	
		• Describe peritoneal reflections, ligaments and bare area of liver.	Should know	C2	
		• Enumerate visceral relations of liver.	Should know	C1	
		• Enlist the structures in porta hepatis.	Should know	C1	
		• Discuss Sub hepatic abscess & Live Biopsy	Should know	C2	
		• Discuss formation, course and parts of portal vein	Should know	C2	
		• Enumerate relations and tributaries of portal vein	Should know	C1	
		• Define portal hypertension	Must know	C1	
		• Describe sites of the portocaval anastomosis and their clinical significance	Must know	C2	
		• Explain role of portocaval shunts • Map outline of liver on simulated patient /model	Must know Must know Must know	C2 P+A C3	

		• Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3	
M1-GIT-A-0092	Gallbladder and Biliary apparatus	• Describe location & size of gall bladder	Should know	C2	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Enumerate relations of gallbladder.	Should know	C1	
		• Describe clinical conditions related to gallbladder	Must know	C2	
		• Enlist different components of Extra-hepatic biliary System	Should know	C1	
		• Discuss the right & left hepatic ducts, common hepatic duct, cystic ducts, bile duct	Should know	C2	
		• Explain differences between Intra & Extra Hepatic Biliary Systems.	Should know	C2	
		• Discuss clinicals related with biliary apparatus	Must know	C2	
		• Discuss accessory hepatic ducts • Map outline of gallbladder & Bile duct on simulated patient /model • Correlate with the clinical conditions • Understand curative and preventive heath care measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use HEC digital library	Should know Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 P+A C3 C3 C3 C3 C3 C3	

M1-GIT-A-0093	Spleen	• Discuss anatomical location and features of spleen with its blood supply, and lymphatic drainage	Should know	C2	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Explain Rupture of spleen & its effects • Map outline of spleen on simulated patient /model • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 P+A C3 C3 C3 C3 C3 C3	
M1-GIT-A-0094	Pancreas	• Recall location, shape, dimensions and extent of pancreas	Should know	C2	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Discuss parts, ducts and relations of pancreas	Should know	C2	
		• Describe arterial supply of pancreas	Should know	C2	
		• Explain applied aspects of pancreas • Map outline of pancrease on simulated patient/ model • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 P+A C3 C3 C3 C3 C3 C3	
		• Describe the position and the	Should know	C2	❖ Clinical Oriented

M1-GIT-A-0095	Vasculature of GIT	vertebral levels of aorta in the abdomen.			Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 228-233, 249-250, 263-285). http://www.anatomyzone.com 3D **anatomy**
		• Enlist the main branches of the aorta and its territories.	Should know	C1	
		• Explain the applied anatomy of the aorta	Should know	C1	
		• Explain origin, course, branches and distribution of celiac trunk • Map outline of abdominal aorta, coeliac trunk, superior &inferior mesenteric artery on simulated patient/ model • Correlate with the clinical conditions • Understand curative and preventive heath 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	Should know Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 P+A C3 C3 C3 C3 C3 C3	
M1-GIT-A-0096	Nerve supply and Lymphatic drainage of GIT	• Discus enteric nervous system with formation of plexuses and its parasympathetic role	Should know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 301-305). http://www.anatomyzone.com 3D **anatomy**
		• Enlist the types of lymph nodes draining the abdomen	Should know	C1	
		• Describe lymphatic drainage of GIT with special reference to lymphatic trunks, cisterna chyli & the thoracic duct • Correlate with the clinical conditions • Understand curative and preventive heath care	Should know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C2 C3 C3 C3 C3 C3 C3	

		measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library			
M1-GIT-A-0097	Cross Sectional Anatomy	• Identify different visceras located at different levels of vertebral coloumn; T10, T11,T12,L1,L2 • Correlate with the clinical conditions • Understand curative and preventive heath 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	Should know Must Know Nice to know Nice to know Nice to know Nice to know Nice to know	C1 C3 C3 C3 C3 C3 C3	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
M1-GIT-A-0098	Rectum	• Discuss the location and extent of rectum	Should know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.7TH Edition. (Chapter 2, Page 239, 248,253 368-371,436,438). http://www.anatomyzone.com 3D **anatomy**
		• Describe the internal and external features of rectum	Should know	C2	
		• Discuss peritoneal reflections rectouterine, rectovesical fossae and their clinical significance	Should know	C2	
		• Enumerate relations of rectum	Should know	C1	
		• Discuss blood supply, nerve supply, venous and lymphatic drainage	Should know	C1	
		• Describe the basis and features of rectal prolapsed • Correlate with the clinical conditions • Understand curative and preventive heath care	Must know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3	

		measures. • Practice the principles of bioethetics • Apply strategic use of A.I in health care • Read relevant research articles • Use of HEC digital library			
M1-GIT-A-0099	Anal canal	• Discuss location and extent of anal canal	Should know	C2	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024
		• Describe external and internal features of Anal Canal	Should know	C2	
		• Discuss features of anal sphincters	Should know	C2	
		• Tabulate relations of the anal canal with the surrounding structures	Should know	C2	
		• Describe the Blood supply, venous and lymphatic drainage & innervations of anal canal	Should know	C2	
		• Discuss anal continence	Should know	C2	
		• Differentiate between internal and external haemorrhoids • Correlate with the clinical conditions • Understand curative and preventive heath 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	Must know Must know Nice to know Nice to know Nice to know Nice to know Nice to know	C3 C3 C3 C3 C3 C3 C3	
M1-GIT-A-00200	Radiological Anatomy	• Identify structures on a normal X-ray abdomen • Appreciate Air fluid shadows. • Mark anatomical landmarks. • Correlate the clinical conditions • Understand the preventive and curative health care measures • Practice the principles of Bioethics	Should know Should know Should know Should know Nice to know Nice to know Nice to know	C2 C2 C3 C3 C3 C3 C3	• **Gross Anatomy** :- KLM clinically oriented anatomy edition 10 • **USMLE Q Bank Step 1** (Volume 1) 2023-2034 **UWORLD Step 1** (Volume 3) 2023-2024

		• Apply Strategic use of AI in health care • Read relevant research articles	Nice to know	C3	

Anatomy Histology Syllabus of Learning Management System (LMS)

Code	Topic	At the end of practical students should be able to	Calgary Gauge	Learning Domain	
M1-GIT-A-00201	Tongue & salivary glands	• Focus & Identify slides of tongue & glands under microscope	Must know	P	• **Histology :-**Junqueira's Basic Histology 18th Edition **USMLE Q Bank Step 1** (Volume 1) 2023-2034
		• Illustrate histological structure of tongue & salivary glands	Should know	C2	
		• Write two points of identification	Must know	C1	
M1-GIT-A-00202	Esophagus	• Focus & Identify slide of Esophagus under microscope	Must know	P	
		• Illustrate histological structure of Esophagus	Should know	C2	
		• Write two points of identification	Must know	C1	
M1-GIT-A-00203	Stomach	• Focus & Identify slide of Stomach under microscope	Must know	P	
		• Illustrate histological structure of Stomach	Should know	C2	
		• Write two points of identification	Must know	C1	
		• Differentiate mucosa of cardiac, fundus, body and pyloric end of stomach	Must know	C2	
M1-GIT-A-00204	Liver, Gall bladder & Pancreas	• Focus & Identify slides of Liver, Gall bladder &Pancreas under microscope	Must know	P	
		• Illustrate histological structures of Liver, Gallbladder & Pancreas	Should know	C2	
		• Write two points of identification	Must know	C1	
M1-GIT-A-00205	Small Intestine	• Focus & Identify slide of small intestine under microscope	Must know	P	
		• Illustrate histological structure of small intestine	Should know	C2	
		• Write two points of identification	Must know	C1	
M1-GIT-A-00206	Large Intestine	• Focus & Identify slide of Large Intestine under microscope	Must know	P	
		• Illustrate histological structure of	Should know	C2	

		large intestine			
		• Write two points of identification	Must know	C1	

Biochemistry LGIS Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the End of Assessment Students Should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-B-0024	Introduction to carbohydrate Metabolism	• Introduction and stages of Metabolism • Differentiation between Anabolism and Catabolism • Transportr of glucose across the cell. (Glucose Transporters)	C2 C2 C2	LGIS	MCQs
M1-GIT-B-0025	Metabolism of monosaccharide & Disaccharide (Fructose, Lactose, Galactose)	• Explain the Metabolism of Fructose, Lactose, Galactose and there related clinical Disotders.	C2	LGIS	MCQs
M1-GIT-B-0026	Glycolysis	• Steps of Glycolysis • Regulation of the Committed Steps • Enetgy calculation in Anaerobic Gylcolosis.	C2 C2 C2	LGIS	MCQs
M1-GIT-B-0027	Fate of Pyruvate	• Pate of Pyruvate • Ciru's Lactic Acid Cycle & Lactic Acidosis	C2 C2	LGIS	MCQs
M1-GIT-B-0028	Function of NADPH and deficiency of G6PD	• Describe hexose monophosphate pathway • Explain functions of NADPH with G6PD deficiency	C2 C2	LGIS	MCQs
M1-GIT-B-0029	Glycogen Metabolism	• Explain synthesis and breakdown of glycogen • Discuss glycogen storage diseases	C2 C3	LGIS	MCQs
M1-GIT-B-0030	Gastric Juice	• Explain composition, function, formation of gastric juice and related disorders • Peptic ulcer disease	C2 C3	LGIS	MCQs
M1-GIT-B-0031	Bile and Pancreatic Juice	• Describe composition, function, formation of bile and related disorders • Describe composition, function and formation of pancreatic juice and related disorder	C2 C2	LGIS	MCQs
M1-GIT-B-0032	GIT Hormones and Succus Entericus	• Understand the sources, functions, and regulation of gastrointestinal hormones. • Describe the composition, secretion, and role of succus entericus in digestion.	C2 C2	LGIS	MCQs
M1-GIT-B-0033	Nutrition	• Understand the roles of macronutrients and micronutrients in energy production and overall health. • Describe the consequences of nutrient deficiencies and excesses in the human body	C2 C2	LGIS	MCQs
M1-GIT-B-0034	Citric acid cycle	• Describe steps, regulations, energy calculations and	C2	LGIS	MCQs

		significance of CAC • Deficiences of coenzymes of pyruvate dehydrogenase complex	C3		
M1-GIT-B-0035	Digestion and Absorption of lipids, proteins and carbohydrates	• Explain the enzymatic processes involved in the digestion of lipids, proteins, and carbohydrates. • Describe the pathophysiology of related disorders	C2 C3	LGIS	MCQs

Biochemistry SGDs Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the End of Assessment Students Should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-B-0036	Gluconeogenesis and its regulation	• Describe the steps and regulations of gluconeogenesis	C2	SGD	MCQs
M1-GIT-B-0037	LFTs and Jaundice	• Describe types of jaundice • Understand and interpret LFTs	C2 C2	SGD	MCQs
M1-GIT-B-0038	Saliva	• Explain formation, composition and biochemical functions of saliva.	C2	SGD	MCQs

Biochemistry SDL Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the End of Assessment Students Should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-B-0039	Pyruvate Kinase Deficiency	• Understand Role of Pyruvate Kinase • Discuss Pathogenesis of PK Deficiency • Understand Clinical Features of PK Deficiency	C1 C2 C3	SDL	MCQs
M1-GIT-B-0040	Clinical disorders related to HMP Shunt	• Explain applied aspects and importance of HMP shunt • Discuss the role of NADPH in phagocytosis	C2 C3	SDL	MCQs
M1-GIT-B-0041	Glycogen storage diseases	• Describe the sign and symptoms and deficient enzymes of glycogen storage diseases	C3	SDL	MCQs
M1-GIT-B-0042	Clinical aspects of Digestive Juices	• Understand the disorder of salivary glands • Discuss clinical aspects related to gastric and pancreatic juice • Understand the pathogenesis of gall stones	C2 C2 C2	SDL	MCQs
M1-GIT-B-0043	Clinical disorders related to digestion and absorption	• Explain disorders i.e. lactose intolerance, cystinuria, hartnup disorder, steatorrhea and cystic fibrosis	C3	SDL	MCQs

Biochemistry Practical Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the End of Assessment Students Should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-B-0044	Glucose 6 phosphate dehydrogenase deficiency	• Explain the biochemical basis of G6PD deficiency and related disorders	C3	CBL	MCQs
M1-GIT-B-0045	Lactose intolerance	• Explain enzymatic deficiency and its related genetic factor • Explain the treatment of lactose intolerance	C2 C2	CBL	MCQs

Transdisciplinary, Interdisciplinary & Multidisciplinary Case Based Learning (CBL)

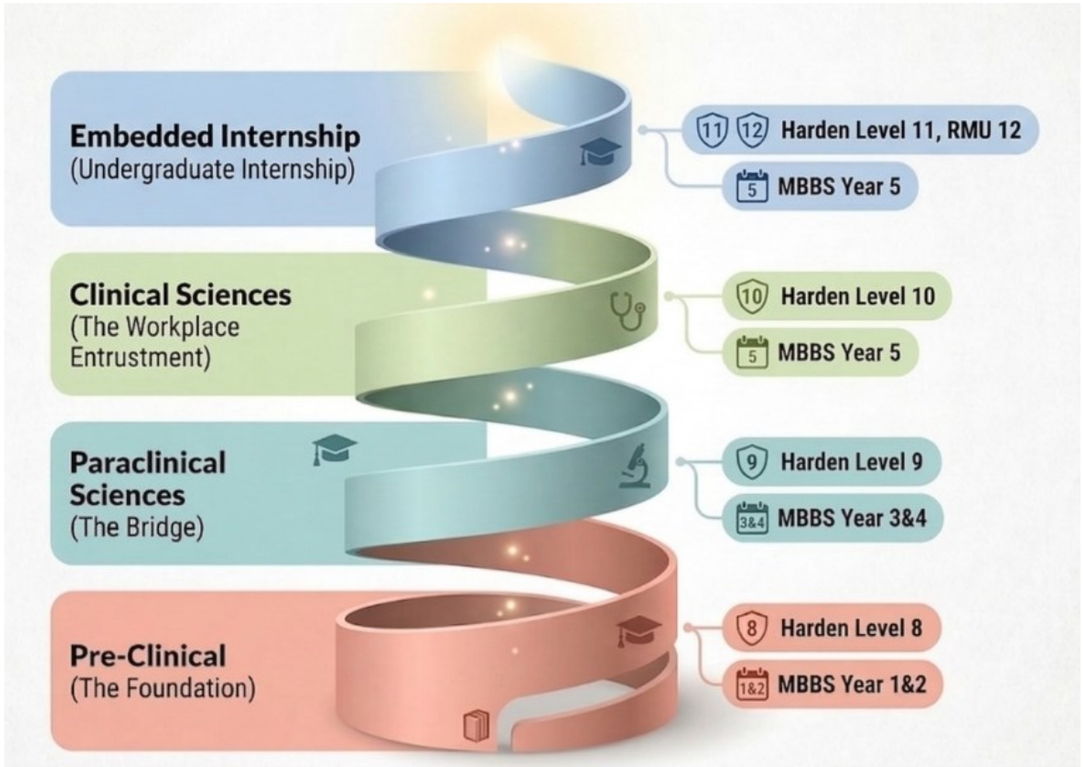
Subject	Topic	At the End of Lecture Students Should Be Able To	Learning Domain
Anatomy	• Acute Appendicitis	Apply basic knowledge of subject to study clinical case.	C3
	• Liver Cirrhosis	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• Peptic Ulcer	Apply basic knowledge of subject 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

➢ **Renal Module-I**

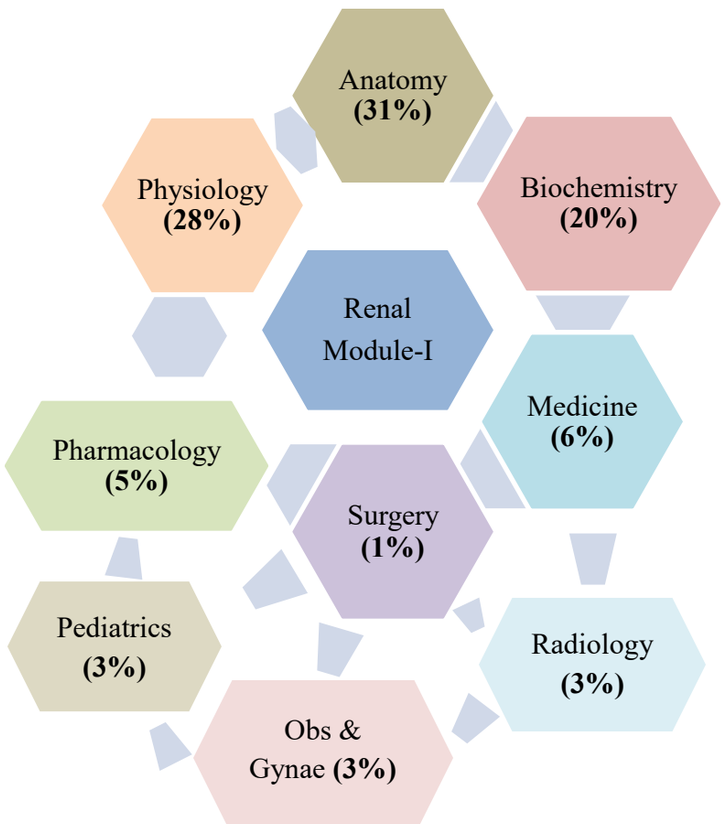
RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



Multi Disciplinary Integration



Disciplines in Renal Module - I



Spiral / General Education Cluster Courses (5%)

Discipline Wise Details of Modular Content

<table>
<tr><th colspan="5">Integration</th></tr>
<tr><th colspan="5">Themes</th></tr>
<tr><th>Block</th><th>Module</th><th>Embryology</th><th>Histology</th><th>Gross Anatomy</th></tr>
<tr><td rowspan="7">IV</td><td>• Anatomy</td><td>Embryology
• Kidney
• Ureter
• Urinary Bladder
• Urethra</td><td>Histology
• Kidney
• Ureter
• Urinary Bladder</td><td>• Posterior Abdominal Wall & Organs of Urinary System</td></tr>
<tr><td>• Biochemistry</td><td colspan="3">• Amino Acid Pool Protein Turn Over Nitrogen Balance & transport of Amino Acid,
• Urea Cycle & Disorder
• Amino Acid Metabolism
• Ammonia Toxicity
• Acid Base in Balance
• Serum Electrolyte</td></tr>
<tr><td>• Physiology</td><td colspan="3">• Body Fluid Compartments, Volume & osmolarity of ECF NICF
• Physiology of Renal System, GFR
• Regulation of GFR & RBF
• Tubular Reabsorbtion & Scretion
• Micturition Reflex & Abnomalities
• Acid base balance</td></tr>
<tr><td colspan="4">Spiral Courses</td></tr>
<tr><td>• Islamiyat</td><td colspan="3">• The literal and civic meaning of Prophethood and the need for Prophethood
• The meaning of the Akharat, its necessity, and wisdom
• Aqida Akhirat, its meaning, necessity, and wisdom</td></tr>
<tr><td>• Pak Studies</td><td colspan="3">• The Objectives and Goals of the Creation of Pakistan
• Nazria e Pakistan or Quid e Azam
• The foundation of the Muslim community</td></tr>
<tr><td>• Fehm e Quran</td><td colspan="3">• Laam for emphasis (لام التأكيد) Superlative Degree like أكبر Revision of all Quranic Sentences
• Emphatic Particle إن Preposition “For” (اللام) Preposition (في)</td></tr>
<tr><td>• Research Club Activity (1-4)</td><td colspan="3">• Synopsis Writing
• Questionnaire Development
• Data Analysis</td></tr>
</table>

		• Manuscript Writing
	• Family Medicine	• Renal Failure
	• Behavioral Sciences	• Perception • Thinking and Motivation
	Vertical Integration	
	• Radiology	• Radiological Evaluation of Oliguria and Renal Failure • Role of Ultrasound X Ray & CT in Renal Systematic Causes
	• Medicine	• Acute renal failure • Potassium imbalance and its management
	• Surgery	• Hydronephrosis / Pyonephrosis
	• Obstetrics & Gynecology	• Physiological Changes in the Renal System in Pregnancy & UTI
	• Pharmacology	• Introduction to diuretics
	• Peads	• UTI
	• Joint Session	• Nephrotic Syndrome (Peads, Medicine, Anatomy, Physiology & Biochemistry)

Renal Module-I Team

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

Module Committee		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar
2.	Director DME & Dean Basic Sciences	Prof. Dr. Ifra Saeed
3.	Additional Director (Assessment) DME	Dr. Arsalan Manzoor Mughal
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar
5.	Chairperson Anatomy	Prof. Dr. Ayesha Yousaf
6.	Chairperson Biochemistry	Dr. Aneela Jamil
7.	Focal Person Anatomy 2nd Year MBBS	Dr. Maria Tasleem
8.	Focal Person Physiology	Dr. Sidra Hamid
9.	Focal Person Pharmacology	Dr. Zunera Hakim
10.	Focal Person Pathology	Dr. Syeda Ayesha
11.	Focal Person Behavioral Sciences	Dr. Zona Tahir
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom
13.	Focal Person Quran Translation Lectures	Dr. Fahd Anwar
14.	Focal Person Family Medicine	Dr. Sadia Khan

Module Task Force Team		
1.	Coordinator	Dr. Sheena Tariq (Senior Demonstrator of Physiology)
2.	DME Focal Person	Dr. Farzana Fatima
3.	Co-coordinator	Dr. Tariq Furqan (Senior Demostrator of Anatomy)
4.	Co-Coordinator	Dr. Jawad Hassan (Senior Demonstrator of Physiology)
5.	Co-coordinator	Dr. Sana Latif (Demonstrator of Biochemistry)

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

Module II – Renal Module-I

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!

Themes, Learning Objectives, Teaching Strategies & Tool of Assessments

Contents

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

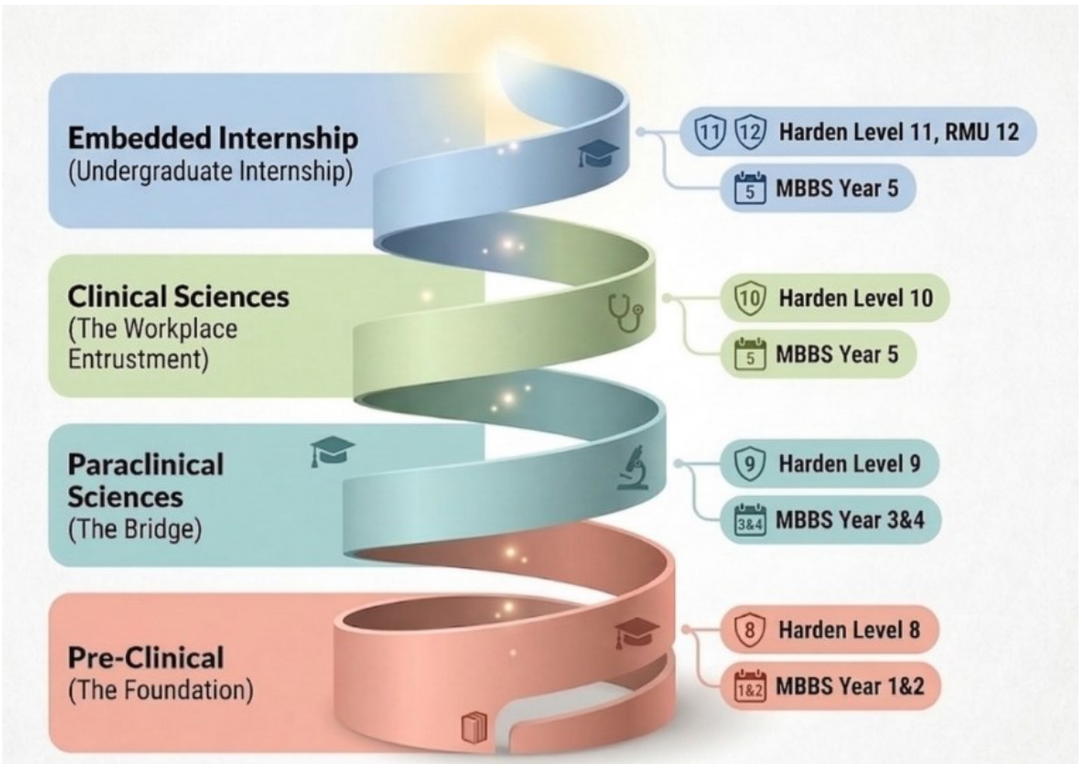
➢ **Syllabus Renal Module-I 2026**

Second Year MBBS

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



Renal – I Module – Second Year MBBS

Duration of Module (Three Weeks)

Sr No.	Themes	Duration
1.	Edema & Fluid Retention	1st Week
2.	Polyuria & Altered Urine Concentration	2nd Week
3.	Oliguria, Uremia & Acid–Base Disturbances	3rd Week

Theme 1: Edema & Fluid Retention (1st Week)

Theme	Rationale	Learning objectives
Edema & Fluid Retention	This week establishes the physiological basis of edema through teaching on body fluid compartments, osmolarity, nephron structure, and GFR formation. Anatomy of the kidney, pelvis, and urinary tract, together with nitrogen metabolism and research sessions, help students clinically explain why renal patients present with generalized body swelling. Students integrate biochemical protein handling, sodium–water balance, and filtration failure, building conceptual links to nephrotic syndrome, AKI onset, and hypoalbuminemia states	After completing this theme, students should be able to: • Describe body fluid compartments and osmolar forces and explain how disturbances in hydrostatic and oncotic pressures lead to edema formation. • Explain nephron structure and glomerular filtration barrier function, and relate alterations in GFR to fluid retention and edema. • Correlate renal sodium and water handling with hormonal and physiological regulation of extracellular fluid volume. • Explain renal protein handling and nitrogen metabolism, emphasizing the role of albumin in maintaining plasma oncotic pressure. • Describe the anatomical basis of renal and urinary tract function and relate structural damage to functional impairment in renal disease. • Integrate biochemical, physiological, and anatomical mechanisms to explain generalized edema in renal conditions. • Apply integrated knowledge to clinical conditions, including nephrotic syndrome, acute kidney injury, and hypoalbuminemia.

Case 1: Clinical Scenario: Generalized Edema Due to Renal Dysfunction

A 28-year-old male presents with a 2-week history of progressive body swelling, first noticed as periorbital puffiness in the morning, later involving the lower limbs and abdomen. He reports reduced urine output, recent weight gain, and frothy urine. There is no history of cardiac or liver disease. He had a recent upper respiratory infection one month earlier.

On examination, he has periorbital edema, bilateral pitting pedal edema, and mild ascites. His blood pressure is elevated. Systemic examination is otherwise unremarkable.

Laboratory Investigations

Urinalysis: Marked proteinuria (+++/++++) with protein casts

24-hour urinary protein: > 3.5 g/day

Serum albumin: Decreased

Total serum protein: Reduced

Blood urea & serum creatinine: Elevated

Estimated GFR: Reduced

Serum electrolytes: Mild hyponatremia
Lipid profile: Hypercholesterolemia, raised LDL and triglycerides
CBC: Within normal limits
Renal ultrasound: Normal-sized kidneys with preserved corticomedullary differentiation

Educational Relevance to the Theme

This clinical scenario is designed to help second-year MBBS students integrate
concepts from physiology, anatomy, and biochemistry covered in the edema theme:
Physiology:
Reinforces understanding of body fluid compartments, osmolar forces, and Starling forces in edema formation.
Demonstrates the physiological significance of GFR and renal sodium–water handling.
Anatomy:
Applies knowledge of nephron structure, glomerular capillaries, and renal anatomy to explain how structural damage leads to functional impairment.
Links renal pelvis and urinary tract anatomy with urine formation and excretion.
Biochemistry:
Highlights the role of plasma proteins, especially albumin, in maintaining oncotic pressure.
Integrates protein metabolism and nitrogen handling in renal disease states.
Clinical Integration:
Introduces students to common renal conditions such as nephrotic syndrome and early acute kidney injury, without requiring advanced clinical knowledge.
Develops the ability to explain clinical signs using basic science principles, a core competency at this stage of training.

Entrustable Professional Activities (EPAs)

EPA-1: Obtain focused history and perform examination in a patient with generalized edema

- Elicit onset, progression of edema (periorbital → dependent), urinary changes (frothy urine, oliguria), infections, and comorbidities.
- Perform examination for periorbital edema, pitting edema, blood pressure, ascites, and volume status.
- Entrustment Level: Level 1–2 (Observation → Performs with supervision)

EPA-2: Correlate renal anatomy, physiology, and biochemistry with edema formation

- Explain role of Starling forces, hypoalbuminemia, reduced GFR, and sodium–water retention.
- Integrate damage to the glomerular filtration barrier with protein loss and systemic edema.
- Entrustment Level: Level 2

EPA-3: Interpret basic investigations in renal edema

- Interpret proteinuria, serum albumin levels, lipid abnormalities, and eGFR.
- Relate laboratory findings to nephrotic syndrome and renal dysfunction.
- Entrustment Level: Level 2

EPAs Detail Annexure-II

Justification:

This case represents full integration into authentic clinical practice, where students manage a real-world renal presentation (generalized edema with proteinuria) by applying Anatomy (glomerular filtration barrier), Physiology (Starling forces, GFR reduction, sodium–water retention), and Biochemistry (hypoalbuminemia, lipid abnormalities) in a unified manner. The scenario requires learners to interpret investigations, explain clinical signs, and develop early management reasoning, reflecting how renal edema is approached in professional healthcare settings. Subject boundaries are no longer visible, fulfilling the criteria of Harden Level 11, where learning is embedded in holistic patient care and clinical performance.

Theme 1 Clinico-concept connect ($C^3$6)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Subject	Code	Topic	Learning Objectives At the End of The Lecture the Student Should Be Able To	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tool
Anatomy Embryology	M2-Renal-A-001	Development of Kidney & ureter	• Enumerate the derivatives of intermediate mesoderm, urogenital and gonadal ridges.	Must know	C1	LGIS	OSPE MCQ SAQ VIVA
			• Analyze the embryological derivatives of intermediate mesoderm and correlate their segmental origin with adult urogenital structures.	Nice to know	C4		
			• Describe the stages of development of human kidneys	Must know	C2		
			• Describe the molecular regulation of kidney development.	Nice to know	C2		
			• Correlate positional changes of the kidney with its blood supply	Must know	C1		
			• Describe different stages of development of ureter from ureteric bud and metanephrogenicblastema.	Must know	C1		
			• Understand the bio-physiological aspects of kidney & ureter development	Must know	C2		
			• Enumerate Congenital anomalies of kidney and ureter.	Must know	C3		
			• Correlate the clinical conditions (polycystic kidney, horseshoe shaped kidney)	Should know	C3		
			• Understand the preventive and curative health care measures	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
Anatomy Embryology	M2-Renal-A-002	Development of urinary bladder & urethra	• Describe the development of urinary bladder	Must know	C2	LGIS	OSPE MCQ SAQ VIVA
			• Evaluate how embryological development of detrusor muscle and trigone influences postnatal bladder function.	Nice to know	C5		
			• Discuss the parts of urethra in males and females	Must know	C2		
			• Describe development of male urethra	Must know	C2		
			• Describe development of female urethra	Must know	C2		

			• Discuss the anomalies related to urethra & bladder development	Should know	C3		
Anatomy Histology	M2-Renal-A-003	Histology of kidney I (Cortex & Medulla)	• Discuss the structural components of the nephron.	Must know	C2	LGIS	OSPE MCQ SAQ VIVA
			• Discuss the histology of filtration barrier.	Must know	C2		
			• Understand the bio-physiological aspects of filtration	Must know	C2		
			• Distinguish the key microscopic components of the renal cortex and medulla.	Must know	C2		
			• Differentiate the histological appearance of proximal tubule, loop of Henley, distal convoluted tubule and collecting duct.	Must know	C2		
			• Correlate the clinical conditions	Should know	C3		
			• Distinguish and analyze the microscopic organization of renal cortex and medulla.	Should know	C4		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
Anatomy Histology	M2-Renal-A-004	Histology of kidney II (Collecting System)	• Enumerate the component cells of the juxta glomerular apparatus.	Should know	C1	LGIS	OSPE MCQ SAQ VIVA
			• Discuss the component cells of the juxtaglomerular apparatus	Must know	C1		
			• Discuss the effect of diabetes & hypertension on glomerular filtration rate	Should know	C2		
			• Evaluate the role of juxtaglomerular apparatus in regulation of systemic blood pressure.	Should know	C5		
			• Read relevant research article	Nice to Know	C3		
Gross Anatomy	M2-Renal-A-007	Posterior abdominal wall I (Fascia & Muscles)	• Describe the fascia of posterior abdominal wall	Must know	C2	SGD	OSPE MCQ SAQ VIVA
			• Tabulate the muscles of posterior abdominal wall with reference to, origin, insertion, nerve supply and action.	Must know	C2		
			• Describe the relations of Psoas major muscle.	Should Know	C2		
			• Correlate the clinical conditions (Psoas Abscess)	Should know	C3		
			• Analyze the arrangement of thoracolumbar fascia and explain its role in compartmentalization and force transmission	Should Know	C4		

			• Map Root of mesentery on SP/Model	Should Know	C3		
			• Practice the principles of Bioethics	Should Know	C3		
			• Apply Strategic use of AI in health care	Nice to know	C3		
Gross Anatomy	M2-Renal-A-008	Posterior abdominal wall II (Nerves)	• Trace the nerves present on posterior abdominal wall	Must know	C2	SGD	OSPE MCQ SAQ VIVA
			• DI Discuss the formation of nerves	Must know	C2		
			• Discuss the formation of lumbosacral plexus	Must know	C2		
			• Correlate the clinical conditions (Lumbar symphathectomy)	Should know	C3		
			• Understand the preventive and curative health care measures	Nice to Know	C3		
			• Practice the principles of Bioethics	Nice to Know	C3		
			• Apply Strategic use of AI in health care	Nice to Know	C3		
			• Read relevant research articles	Nice to Know	C3		
Gross Anatomy	M2-Renal-A-009	Posterior abdominal wall III (vessels) & Lumbar Vertebrae	• Enlist branches of Abdominal Aorta.	Must know	C1	SGD	OSPE MCQ SAQ VIVA
			• Describe the tributaries of inferior vena cava.	Must know	C2		
			• Describe lymph nodes of posterior abdominal wall with emphasis on lumbar and intestinal trunk.	Must know	C2		
			• Differentiate between typical and atypical lumbar vertebrae.	Must know	C2		
			• Identify different parts of lumbar vertebrae.	Must know	C2		
			• Discuss the attachments of lumbar vertebrae.	Nice to Know	C2		
			• Correlate the clinical conditions (abdominal aortic aneurysm)	Should know	C3		
			• Understand the preventive and curative health care measures	Must know	C3		
			• Map Abdominal aorta, Inferior Vena cava & Portal vein on simulated patient (SP)/Model	Must know	C3		
			• Practice the principles of Bioethics	Nice to Know	C3		
			• Apply Strategic use of AI in health care	Nice to Know	C3		
			• Read relevant research articles	Nice to Know	C3		

Gross Anatomy	M2-Renal-A-0010	Kidney	• Discuss the site and extent of kidneys	Must know	C2	SGD	OSPE MCQ SAQ VIVA
			• Differentiate right from left kidney	Must know	C2		
			• Understand the bio-physiological aspects of kidney	Must know	C2		
			• Discuss the renal capsule and its role in support of kidney.	Must know	C2		
			• Describe the structure of cortex and medulla	Must know	C2		
			• Describe peritoneal relationship of both kidneys.	Must know	C2		
			• Describe visceral relationship of both kidneys	Must know	C2		
			• Explain blood supply of both kidneys with emphasis on renal artery.	Must know	C2		
			• Discuss the venous drainage of both kidneys.	Must know	C2		
			• Correlate the clinical conditions (perinephric abscess, nephroptosis, renal cysts and renal colic)	Should know	C3		
			• Evaluate the clinical significance of segmental arteries in nephrectomy.	Nice to know	C5		
			• Map the kidney on the back (Morrison's Parrallelogram) on SP/Model	Nice to know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply Strategic use of AI in health care	Nice to know	C3		
			• Read relevant research articles	Nice to know	C3		
Gross Anatomy	M2-Renal-A-0011	Ureter	• Discuss extent and course of ureter in abdomen and pelvis in males and females	Must know	C2	SGD	OSPE MCQ SAQ VIVA
			• Explain peritoneal reflections of ureter in both sexes.	Must know	C2		
			• Describe relations of ureter.	Should know	C2		
			• Describe the arterial, venous and lymphatic drainage of ureter.	Nice to know	C2		
			• Correlate the clinical conditions (ureteric colic)	Nice to know	C3		
			• Understand the preventive and curative health care measures	Must know	C3		
			• Map Ureter from the back on SP/Model	Nice to Know	C3		

			• Practice the principles of Bioethics	Nice to Know	C3			
			• Apply Strategic use of AI in health care	Nice to Know	C3			
			• Read relevant research articles	Nice to Know	C3			
Anatomy (SKL)	M2-Renal-A-0024	Kidney	• Identify the histological slide of kidney.	Must know	C3		Skill Lab	OSPE
			• Construct a labeled histological diagram correlating cortex and medulla organization.	Should know	C6			
			• Enlist two points of identification.	Must know	C2			
			• Focus the slide	Must know	C3			
Physiology (LGIS)	M2-Renal-P-001	Body fluid compartments, Volume & osmolarity of ECF &ICF.	• Fluid Intake/Output balance	Should know	B	C1	LGIS	SAQ MCQ VIVA
			• Body fluid compartments	Must know	A	C2		
			• Constituents of ECF & ICF	Must know	A	C2		
			• Concept of Osmolarity, Osmolality,Osmosis and Osmotic pressure	Must know	A	C1		
	M2-Renal-P-002	Physiology of Renal system,Glomerular filtration rate	• Functions of kidney.	Should know	B	C2	LGIS SGD	SAQ MCQ VIVA
			• Physiologic Anatomy of Kidney	Should know	B	C2		
			• Concept of Glomerular Filtration	Must know	A	C2		
			• Introduction to Glomerular filtration rate.	Must know	A	C1		
	M2-Renal-P-003	Abnormalities of fluid volume & regulation, Edema	• Volume and osmolarity in abnormalstates	Must know	A	C1	LGIS SGD	SAQ MCQ VIVA
			• Abnormalities of fluid volume &Regulation	Must know	A	C1		
			• Hyponatremia and Hypernatremia	Should know	B	C2		
			• Edema and its Mechanism.	Must know	A	C1		
			• Fluid in potential spaces of the body	Should know	B	C2		
	M2-Renal-P-004	**A.** Regulation of GFR & RBF-I (Determinants of GFR & RBF) Regulation of GFR & RBF-II, Physiological control of GFR and	• Glomerular filtration rate & Renal Blood flow	Must know	A	C1	LGIS SGD	SAQ MCQ VIVA
			• Determinants of GFR	Must know	A	C1		
	M2-Renal-P-005	RBF, Auto regulation of GFR and RBF/Macula	• Determinants of RBF	Must know	A	C1	LGIS SGD	SAQ MCQ VIVA
			• Physiological control of GFR and RBF.	Must know	A	C1		
			• Auto regulation of GFR and RBF.	Must know	A	C2		
			• Tubulo-glomerular Feedback Mechanism	Must know	A	C1		

		densa feedback mechanism	• Macula-densa Feedback Mechanism		Must know	A	C2		
Physiology (SGD)	M2-Renal-P-009	GFR & RBF	• Explain factors effecting GFR		Must Know	A	C2	SGD	MCQ SEQ VIVA OSPE
			• Discuss determinants of RBF		Must Know	A	C2		
			• Explain autoregulatory mechanism of GFR & RBF		Must Know	A	C2		
Physiology (SDL)	M2-Renal-P-0015	Abnormalities of fluid volume &regulation, Edema	• 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	• 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 ofVolume 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)				
	M2-Renal-P-0016	**B.** Regulation of GFR & RBF-I (Determinants of GFR & RBF) **C.** Regulation of GFR & RBF-II, Physiological control of GFR and	• Glomerular filtration rate & Renal Blood flow • Determinants of GFR	❖ A. ❖ Ganong's Review of Medical Physiology.25TH Edition. Regulation of ECF composition andvolume, Section 07 (Chapter 37, Page 674) ❖ Physiology by Linda S. Costanzo 6th Edition.Renal Physiology (Chapter 06. Page 257,261)				
	M2-Renal-P-0017	RBF, Auto regulation of GFR and RBF/Macula densa feedback mechanism	• Determinants of RBF • Physiological control of GFR and RBF. • Auto regulation of GFR and RBF. • Tubulo-glomerular Feedback Mechanism • Macula-densa Feedback Mechanism	❖ 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) ❖ B. ❖ 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)				

	M2-Renal-P-0013	Body fluid compartments, Volume & osmolarity of ECF &ICF.	• Fluid Intake/Output balance • Body fluid compartments • Constituents of ECF & ICF • Concept of Osmolarity, Osmolality,Osmosis and Osmotic pressure	❖ 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)			
	M2-Renal-P-0014	Physiology of Renal system, Glomerular filtration rate	• Functions of kidney. • Physiologic Anatomy of Kidney • Concept of Glomerular Filtration • Introduction to Glomerular filtration rate.	• 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)			
Biochemistry (LGIS)	M2-Renal-B-001	Introduction to protein metabolism	• Understand protein turn-over, amino acid pool and entry of amino acid into cell. • Read a relevant research article • Use HEC digital library	Should Know	C2 C2 C3	LGIS	MCQs, SAQs SEQs Viva
	M2- Renal -B-002	Metabolism of glycine, phenylalanine and tyrosine	• Explain Glycine, phenylalanine and tyrosine metabolism • Correlate clinically • Use HEC digital library	Must Know	C2 C4 C3	LGIS	MCQs, SAQs S EQs Viva
			• Understand the curative and preventive healthcare measures • Read a relevant research article • Use HEC digital library	Must Know	C2		MCQs, SAQs SEQs Viva
	M2- Renal -B-003	Urea Cycle	• Describe the location, steps and regulation of Urea cycle • Relate associated clinical disorders • Read a relevant research article • Use HEC digital Library	Must Know	C2 C3 C2 C3	LGIS	MCQs, SAQs SEQs Viva

	M2-Renal-B-004	Disorders of Urea Cycle	• Describe Disorders of the urea cycle • Understand the curative and preventive healthcare measures • Apply the use of artificial intelligence in healthcare	Must Know	C2 C2 C3	LGIS	MCQs, SAQs SEQs Viva
	M2-Renal-B-005	Glutamine, Histidine, Threonine and Polyamines Metabolism	• Describe Glutamine, Histidine, Threonine & Polyamines Metabolism • Correlate clinically • Use HEC digital library	Must Know	C2 C4 C3	LGIS	MCQs, SAQs SEQs Viva
Biochemistry (SGD)	M2-Renal-B-006	Phenylalanine Metabolism	• Explain Phenylalanine Metabolism • Relate with associated clinical disorder	Should Know	C2 C4	SGD	MCQs
Biochemistry (SDL)	M2-Renal-B-007	Clinical Disorders of Ammonia Metabolism	Discuss Related inherited disorders	Must Know	Harper's illustrated biochemistry 32nd edition (Chapter 40 page 477) https://link.springer.com/article/10.1007/BF00998474		
Biochemistry (SKL)	M2-Renal-B-008	Serum estimation of Urea & Creatinine	• Understand the clinical significance of urea and creatinine levels in health and disease. • Describe methods for estimating urea and creatinine • Perform estimation of urea and creatinine	Must Know Should Know Should Know	P	Skill Lab	OSPE
Surgery	M2-Renal-VI(S)-002	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			
			• Understand the pathophysiology, diagnosis, and management strategies for congenital anomalies like VUR and PUJO, including both surgical and non-surgical approaches.	C2			

Spiral Courses (2nd Week)

The Pak Studies

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(PKS)-001	The Objectives and Goals of the Creation of Pakistan	• Understand the historical context, objectives, and vision behind the creation of Pakistan, including the principles of social justice, religious freedom, and political autonomy that led to its establishment	C2	LGIS	SAQ
		• Discuss how the goals of Pakistan's creation, such as providing a platform for the welfare of Muslims and promoting equality, can be linked to ethical principles and responsibilities within the medical profession and society at large.	C2		

Integrated Undergraduate Research Curriculum (IUGRC)

Code	Topic	Learning Objectives	Cognitive Domain	Teaching Strategy	Assessment Tool
M2-Renal-SI(IUGRC)-001	**Research Club Activity 1** Synopsis Writing	• Organize research idea or general thought into a topic that can be configured into research problem • Formulating a research question according to FINER Criteria • Formulate appropriate research questioning using PEO/PICO/PICOT format • Understand the concept of literature review • Cognizant with concept of publication ethics Outline steps of synopsis writing according to SJRMC Guidelines	C3 C3 C2 C2 C2 C2	LGIS	MCQs

Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C^36) Sessions for 1st Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
Clinico-Concept Connect (C^36) Sessions - I	Edema & Fluid Retention	Anatomy	This scenario helps students correlate renal structure with impaired function.	• Identify the parts of the nephron and explain their role in urine formation.	C2	MCQs
				• Describe the anatomy of the glomerulus and renal capillary network.	C2	MCQs
				• Correlate structural changes in renal tissue with functional impairment.	C4	MCQs
				• Relate the anatomy of the renal pelvis and urinary tract to urine drainage and excretion.	C5	MCQs
		Physiology	This scenario reinforces the physiological basis of edema and fluid imbalance.	• Explain the role of Starling forces in the development of edema.	C2	MCQs
				• Describe the distribution of body fluid compartments and their relevance in fluid accumulation.	C3	MCQs
				• Discuss the importance of glomerular filtration rate (GFR) in maintaining fluid balance.	C3	MCQs
				• Explain how altered renal sodium and water handling contributes to edema formation.	C3	MCQs
		Biochemistry	This scenario highlights the biochemical mechanisms underlying edema and renal disease.	• Explain the role of albumin and plasma proteins in maintaining oncotic pressure.	C3	MCQs
				• Describe how hypoalbuminemia contributes to edema.	C3	MCQs
				• Discuss the biochemical significance of protein loss in urine.	C3	MCQs
				• Relate protein metabolism and nitrogenous waste handling to renal dysfunction.	C4	MCQs
		Medicine	This scenario introduces students to the medical interpretation of edema and renal dysfunction using basic science principles.	• Recognize common causes of edema such as renal, cardiac, hepatic, and nutritional disorders.	C2	MCQs
				• Identify the basic clinical features of nephrotic syndrome and acute kidney injury.	C4	MCQs
				• Explain clinical findings such as facial puffiness, pedal edema, oliguria, and proteinuria.	C4	MCQs
				• Develop an approach to correlating clinical signs with underlying pathophysiology.	C6	MCQs

				• Recognize common causes of edema such as renal, cardiac, hepatic, and nutritional disorders.	C6	MCQs
		Radiology	This scenario introduces the supportive role of imaging in evaluating renal structure and fluid-related disorders.	• Identify the role of ultrasound in assessing kidney size, renal structure, and urinary tract obstruction.	C2	MCQs
				• Understand how radiological investigations help in evaluating ascites, pleural effusion, or generalized fluid overload.	C2	MCQs
				• Correlate basic renal anatomy with its appearance on imaging studies.	C3	MCQs
				• Appreciate the importance of imaging as a non-invasive tool in early assessment of renal pathology.	C4	MCQs
				• Identify the role of ultrasound in assessing kidney size, renal structure, and urinary tract obstruction.	C4	MCQs
		Family Medicine	This scenario highlights the role of family medicine in early recognition, initial evaluation, and timely referral of patients with edema.	• Recognize edema as a common presenting complaint in primary care practice.	C3	MCQs
				• Take a focused history to identify possible renal and systemic causes of swelling.	C4	MCQs

Theme 2: Polyuria & Altered Urine Concentration (2nd Week)

Theme	Rationale	Learning objectives
Polyuria & Altered Urine Concentration	Learners study countercurrent mechanisms, tubular function, ammonia handling, and electrolyte regulation, which clinically underpin excessive urine output, nocturia, and dilute/high-volume urine states. Radiology and anatomy sessions on ureters, bladder, and pelvis enhance understanding of obstructive uropathy and hydronephrosis. Clearance testing, renal transport processes, and hormonal control allow students to connect physiology to real disorders such as diabetes insipidus, renal tubular defects, prerenal/renal failure, and SIADH showing why urine concentration is altered clinically.	After completing this theme, learners should be able to: • Explain the countercurrent multiplication and exchange mechanisms and describe their role in urine concentration and dilution. • Describe tubular function along different nephron segments, including water, sodium, urea, and ammonia handling, and relate defects to high-volume urine states. • Explain renal electrolyte regulation (Na^+, K^+, Cl^-) and its impact on urine volume and osmolality. • Describe the physiological basis of ammonia handling and acid–base balance, and its relevance to tubular function. • Explain hormonal regulation of urine concentration, including ADH, aldosterone, and natriuretic peptides. • Interpret clearance tests and renal transport processes to distinguish between prerenal, renal, and postrenal causes of polyuria. • Correlate anatomical and radiological features of the ureters, bladder, and renal pelvis with obstructive uropathy and hydronephrosis. • Apply integrated physiological, anatomical, and biochemical concepts to clinical disorders such as diabetes insipidus, renal tubular defects, SIADH, and renal failure

Case 2: Patient with Excessive and Frequent Urine Output

A 35-year-old Pakistani male presents to the outpatient clinic with complaints of passing large amounts of urine frequently, for the past three weeks. He reports that he has to wake up multiple times at night to pass urine (nocturia) and feels persistently thirsty. Despite drinking normal amounts of water initially, his urine remains clear, dilute, and high in volume.

There is no history of diabetes mellitus. He denies dysuria or flank pain. He has no known cardiac or liver disease.

On examination, the patient appears mildly dehydrated with dry oral mucosa. Blood pressure is normal. Systemic examination is unremarkable.

Investigations (Integrated Understanding)

- Urine analysis: Pale, dilute urine with low specific gravity
- Urine osmolality: Reduced
- Serum electrolytes: Mild hypernatremia

- Serum creatinine: Within normal limits
- Water deprivation test: Failure to concentrate urine
- Renal ultrasound: Normal kidneys, no obstruction

Clinical Correlation

The patient's symptoms are explained by impaired tubular response to ADH, leading to failure of water reabsorption in the collecting ducts. Dysfunction of the countercurrent mechanism prevents formation of concentrated urine, resulting in polyuria and nocturia.

This scenario demonstrates how tubular transport processes, hormonal control, and countercurrent physiology determine urine concentration. It also allows learners to differentiate between diabetes insipidus, renal tubular defects, SIADH, and obstructive causes using basic science principles.

Educational Relevance for Second-Year MBBS (Basic Sciences)

This theme enables students to:

Link physiology to patient complaints such as excessive urine output and nocturia

Understand why urine becomes dilute or concentrated clinically

Apply renal anatomy and radiology to exclude obstruction and hydronephrosis

Use clearance concepts and hormonal regulation to interpret investigations

Develop early clinical reasoning without requiring advanced clinical knowledge

This approach strengthens horizontal and vertical integration, reinforcing the clinical relevance of renal physiology taught in the basic sciences.

Entrustable Professional Activities (EPAs)

EPA-1: Obtain focused history and perform examination in polyuria

- Assess urine frequency, volume, nocturia, thirst, and fluid intake.
- Evaluate hydration status, blood pressure, and mucosal dryness.
- Entrustment Level: Level 1–2

EPA-2: Explain physiological mechanisms responsible for polyuria

- Correlate countercurrent mechanism, ADH activity, and collecting duct physiology with urine concentration.
- Explain mechanisms of diabetes insipidus and tubular defects.
- Entrustment Level: Level 2

EPA-3: Interpret investigations and differentiate causes of polyuria

- Interpret urine osmolality, specific gravity, serum sodium, and water deprivation test.
- Differentiate diabetes insipidus, osmotic diuresis, SIADH, and renal tubular disorders.
- Entrustment Level: Level 2

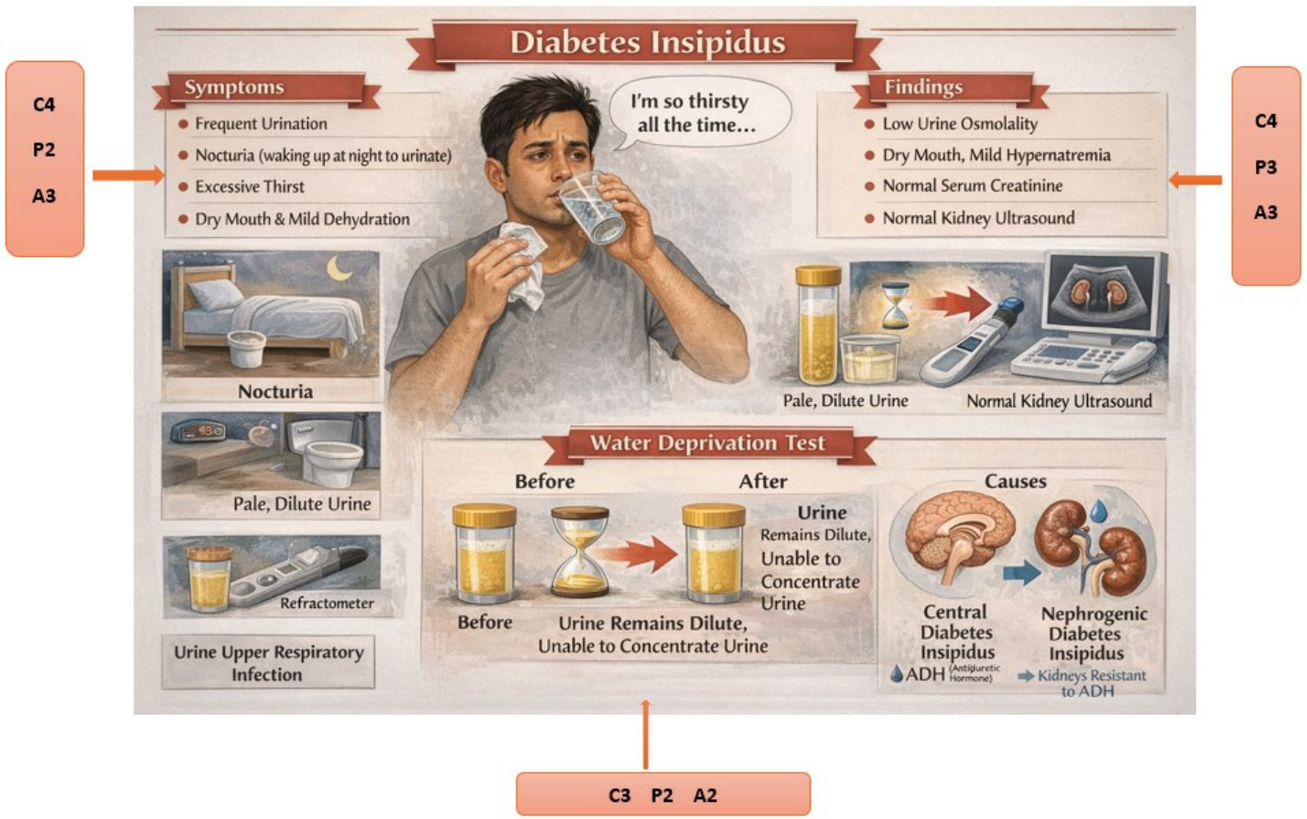
EPAs Detail Annexure-II

Justification:

This case functions as a **true patient-centered clinical task**, requiring students to integrate renal physiology (countercurrent mechanism, tubular transport, ADH

response), Anatomy and Radiology (exclusion of obstruction/hydronephrosis), and Biochemistry (electrolyte disturbances, osmolality changes) seamlessly in diagnosing polyuria. Learners must apply basic sciences directly to clinical decision-making, including interpretation of the water deprivation test and differentiation of diabetes insipidus from other disorders. Such workplace-style reasoning demonstrates **Harden Level 11 integration**, where biomedical knowledge is applied as a single professional competency rather than separate subjects.

Theme 2 Clinico-concept connect ($C^3$6)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Subject	Code	Topic	Learning Objectives At the End of The Lecture the Student Should Be Able To	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tool
Anatomy Histology	M2-Renal-A-005	Histology of Urinary Bladder	• Describe histological characteristics of urinary bladder.	Must know	C2	LGIS	OSPE MCQ SAQ VIVA
			• Explain the concept of umbrella cells and Uroplakins.	Must know	C2		
			• Explain the concept of internalization	Must know	C2		
			• Understand the bio-physiological effects of urinary epithelium	Must know	C2		
			• Compare the histological changes of empty and full bladder.	Must know	C2		
			• Correlate the clinical conditions	Should know	C2		
			• Analyze the structural specialization of umbrella cells and the functional role of uroplakins in maintaining urinary barrier integrity.	Nice to Know	C4		
			• Practice the principles of Bioethics	Nice to Know	C2		
			• Apply strategic use of AI in health care	Nice to Know	C2		
			• Read relevant research article	Nice to Know	C2		
Anatomy Histology	M2-Renal-A-006	Histology of ureter & urethra	• Describe the microscopic structure of ureter • Discuss the histological features of urethra	Must know	C2	LGIS	OSPE MCQ SAQ VIVA
			• Distinguish the transition in epithelium in different types of urethrae	Must know	C2		
			• Correlate the clinical conditions	Must know	C2		
			• Understand the preventive and curative health care measures	Should know	C3		
			• Develop an ethical framework for invasive urethral procedures.	Nice to Know	C6		
			• Apply strategic use of AI in health care	Nice to Know	C3		
			• Read relevant research article	Nice to Know	C3		
Gross Anatomy	M2-Renal-A-0012	Supra renal gland	• Describe the location & visceral relations of right and left supra renal glands	Must know	C2	SGD	OSPE MCQ SAQ
			• Understand the bio-physiological aspects of kidney	Must know	C2		
			• Discuss supra renal cortex and medulla	Must know	C2		

			• Discuss vessels and nerves of supra renal gland	Must know	C2		VIVA
			• Correlate the clinical conditions	Should know	C3		
			• Understand the preventive and curative health care measure	Nice to Know	C3		
			• Practice the principles of Bioethics	Nice to Know	C3		
			• Apply Strategic use of AI in health care	Nice to Know	C3		
			• Read relevant research articles	Nice to Know	C3		
Gross Anatomy	M2-Renal-A-0013	Urinary bladder	• Interpret size and extent of urinary bladder in different ages and states.	Must know	C2	SGD	OSPE MCQ SAQ VIVA
			• Discuss the peritoneal and visceral relationships of urinary bladder (bladder bed)	Must know	C2		
			• Understand the bio-physiological aspects of kidney	Must know	C2		
			• Discuss the trigone of urinary bladder	Must know	C2		
			• Elaborate nerve supply of urinary bladder	Must know	C2		
			• Correlate the clinical conditions (urinary incontinence, suprapubiccystotomy and atonic bladder	Should know	C3		
			• Understand the preventive and curative health care measures	Nice to Know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply Strategic use of AI in health care	Should know	C3		
			• Read relevant research article	Nice to know	C3		
Gross Anatomy	M2-Renal-A-0013	Urethra	• Describe different parts of male and female urethra.	Must know	C2	SGD	OSPE MCQ SAQ VIVA
			• Explain blood supply, innervation and lymphatics of urethra in both sexes	Must know	C2		
			• Discuss the clinically significant differences between male and female urethra	Must know	C2		
			• Correlate the clinical conditions	Should know	C3		
			• Understand the preventive and curative health care measures	Must know	C3		
			• Analyze the structural organization of male and female urethra and relate regional differences to functional	Nice to know	C4		

			significance.				
			• Apply Strategic use of AI in health care	Nice to know	C3		
			• Read relevant research articles	Nice to know	C3		
Anatomy (SKL)	M2-Renal-A-0025	Ureter	• Identify the histological slide of ureter	Must know	C2	Skill Lab	OSPE
			• Illustrate the histological structure of ureter.	Should know	C2		
			• Enlist two points of identification.	Must know	C1		
			• Focus the slide • Evaluate the adequacy of focusing technique to accurately visualize mucosal folds and muscular layers.	Must know Nice to know	C3 C5		
Physiology (LGIS)	M2-Renal-P-008	**A.** Clearance methods to quantify kidney function Micturition reflex & Abnormalities of micturition	• Clearance Methods (Inulin clearance, Creatinine clearance, Para ammino hipuric acid clearance)	Must know	A	C1 C1 C1	LGIS SGD	SAQ MCQ VIVA
			• Filtration Fraction	Should know	B	C1		
			• Anatomy of bladder	Must know	A	C1		
			• Micturition and urine formation.	Must know	A	C1		
			• Control of Micturition and Micturition Reflex	Must know	A	C2		
			• Abnormalities of Micturition Reflex					
	M2-Renal-P-006	Tubular reabsorption & secretion along various parts of nephrons	• Tubular reabsorption & secretion in ○ Proximal tubule ○ Loop of Henle ○ Distal tubule & collecting tubule.	Must know	A	C1	LGIS Group presentations	SAQ MCQ VIVA
				Must know	A	C2		
				Must know	A	C1		
				Must know	A	C1		
				Must know	A	C2		
			Active and passive transport mechanisms					
Physiology (SGD)	M2-Renal-P-0010	Micturition	• Describe the physiological anatomy & nervous connections of urinarybladder	Should Know	B	C1	SGD	MCQ SEQ VIVA OSPE
			• Explain Micturition reflex	Must Know	A	C2		
			• Discuss abnormalities of Micturition	Must Know	A	C2		
Physiology (SDL)	M2-Renal-P-0018	Tubular reabsorption & secretion along various parts of nephrons	• Tubular reabsorption & secretion in • Proximal tubule • Loop of Henle • Distal tubule & collecting tubule. • Active and passive transport mechanisms					
				• 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)			
	M2-Renal-P-0019	Regulation of tubular reabsorption	• Concept of Glomerulo tubular Balance • Peritubular capillary and Renal interstitial fluid Physical forces. • Mechanism of Pressure natriuresis and Pressure diuresis	• 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)			
Biochemistry (LGIS)	M2-Renal-B-009	Metabolism of ammonia	• Explain sources of NH_3 formation and its transport • Correlate causes and effects of Hyperammonemia • Reframe the mechanism of ammonia toxicity • Design the curative and preventive healthcare measures • Read a relevant research article • Use HEC digital library	Must Know	C2 C4 C5 C6 C2 C3	LGIS	MCQs, SAQs Viva
	M2-Renal-B-010	Metabolism of Arginine & branched chain amino acids	• Explain Metabolism of arginine and branched chain amino acids • Reframe related inherited disorders • Role play principles of bioethics • Design the curative and preventive healthcare measures. • Use HEC digital library	Must Know	C2 C5 C6 C6 C3	LGIS	MCQs, SAQs SEQs Viva
	M2-Renal-B-011	Sodium and chloride Metabolism	• Describe Daily requirements, sources, functions & their deficiency and toxic effects on body • Design the curative and preventive healthcare measures. • Apply the use of artificial intelligence in healthcare • Read a relevant research article • Use HEC digital library	Must Know Must Know	C2 C6 C3 C2 C3	LGIS LGIS	MCQs, SAQs Viva MCQs, SAQs Viva
	M2-Renal-B-012	Acid base Imbalance-I	• Reframe causes and compensation of metabolic acid base disorders • Describe anion gap and its significance • Categorize different acid base disorders • Design the curative and preventive healthcare measures. • Read a relevant research article • Use HEC digital library	Must Know	C5 C2 C4 C6 C2 C3	LGIS	MCQs, SAQs SEQs Viva

Biochemistry (SGD)	M2-Renal-B-013	Ammonia Toxicity	• Correlate ammonia toxicity	Should Know	C4	SGD/CBL	MCQs SAQs Viva
Biochemistry (SDL)	M2-Renal-B-014	Disorders Related to Branched Chain Amino Acid Metabolism	• Describe Disorders Related to Branched Chain Amino Acid Metabolism	❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#20, Page 290-300.			
Biochemistry (SKL)	M2-Renal-B-015	Urine Analysis-I	• Examine urine for its color, odor, pH and specific gravity • Perform tests on urine to detect its normal constituents	Should Know Should Know	P P	Skill Lab	OSPE
Radiology	M2-Renal-VI(R)-002	Contrast Nephropathy	• Understand the diverse manifestations of nephropathy, including diabetic nephropathy and IgA nephropathy	C2		LGIS	MCQs
Medicine	M2-Renal-VI(M)-001	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

Spiral Courses (2nd Week)

Behavioral Sciences

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M2-Renal-VI(BS)-001	Perception	• Understand the basic principles of sensory perception, including how sensory stimuli are detected and processed by the nervous system.	C2	LGIS	MCQs
		• Explain the mechanisms involved in different types of sensory perception (visual, auditory, tactile, etc.) and their neural pathways.	C2		
M2-Renal-VI(BS)-002	Thinking and Motivation	• Explain the different types of thinking (e.g., critical thinking, problem-solving, decision-making) and their relevance in clinical practice.	C2		
		• Understand how effective thinking and decision-making are essential for diagnosis, treatment planning, and patient care.	C2		

Integrated Undergraduate Research Curriculum (IUGRC)

Code	Topic	Learning Objectives	Cognitive Domain	Teaching Strategy	Assessment Tool
M2-Renal-SI(IUGRC)-003	**Research Club Activity 3** Data Analysis	• Make variables on computer • Feed data under variables on computers • Summarize data on computer including text, tabulations & graphics • Perform Descriptive analysis of data on computer • Organize, and save data in a suitable way. • Calculate/recode variables and prepare data for analysis. • Conduct descriptive and basic inferential statistics. • Be familiar with SPSS presentation of statistical output. • Create and edit graphical displays of data.	C2 C3 C2 C3 C3 C2 C2 C3	LGIS	MCQs

M2-Renal-SI(IUGRC)-004	**Research Club Activity 4** Manuscript Writing	• Interpret & apply basic principles of manuscript writing of research report • Perceive authorships requirements or rules of drafting manuscript of a research report for publication in indexed journal • Write discussion section of draft • Explain conclusion, recommendation and acknowledge part of research report • clarify types of citations included in discussion section	C3 C2 C2 C2 C2	LGIS	MCQs

The Islamiayat

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(ISL)-001	The literal and civic meaning of Prophethood and the need for Prophethood	• Understand the literal and civic meanings of Prophethood, including its role in guiding ethical behavior, morality, and the establishment of a just society, and relate these principles to medical practice and patient care.	C2	LGIS	SAQ
		• Discuss the necessity of Prophethood in providing a moral and spiritual framework for human guidance,	C2		
M1-GIT-SI(ISL)-002	The meaning of the Akharat, its necessity, and wisdom	• Understand the concept of the Akhirat (Hereafter), its significance in Islamic teachings, and how it influences ethical decision-making and moral responsibility in both personal and professional life, including medical practice.	C2	LGIS	SAQ
		• Discuss the necessity of belief in the Akhirat for shaping human behavior, motivating compassion and accountability, and explore the wisdom behind the concept in fostering a sense of duty and integrity in the healthcare profession.	C2		

Transdisciplinary (Hardens Level 11) Clinico-Concept Connect ($C^3$6) Sessions for 2nd Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
Clinico-Concept Connect ($C^3$6) Sessions - II	Polyuria & Altered Urine Concentration	Anatomy	This theme is highly relevant for second-year MBBS students because it allows them to apply core concepts of physiology, anatomy, biochemistry, and early clinical interpretation to a common renal presentation. It helps students relate basic science knowledge to patient complaints such as excessive urine output, nocturia, and altered urine concentration, while remaining within the level of understanding expected in the preclinical years.	• Apply knowledge of renal anatomy to understand urine formation and drainage.	C2	MCQs
				• Relate the nephron and collecting system to clinical symptoms involving urine output.	C2	MCQs
				• Understand the anatomical basis of urinary obstruction and hydronephrosis.	C3	MCQs
				• Correlate renal structure with functional disturbances in urinary complaints.	C4	MCQs
		Physiology		• Link renal physiology to patient complaints such as polyuria and nocturia.	C2	MCQs
				• Understand the mechanisms responsible for dilute and concentrated urine formation.	C3	MCQs
				• Apply concepts of clearance, GFR, and tubular handling in interpreting renal function.	C4	MCQs
				• Explain the role of hormonal regulation, especially ADH and aldosterone, in water and electrolyte balance.	C3	MCQs
		Biochemistry		• Interpret the biochemical basis of water and electrolyte imbalance in renal disorders.	C4	MCQs
				• Understand how changes in solute handling affect urine concentration.	C3	MCQs
				• Apply basic concepts of urea, creatinine, and renal clearance to laboratory interpretation.	C4	MCQs
				• Relate hormonal control of fluid balance to underlying biochemical mechanisms.	C5	MCQs
		Medicine		• Develop an early understanding of common renal complaints such as polyuria, nocturia, and altered urine output.	C2	MCQs
				• Interpret patient symptoms using basic physiological principles rather than advanced clinical knowledge.	C6	MCQs
				• Recognize how disturbances in renal handling of water and solutes produce clinical manifestations.	C5	MCQs

				• Build early clinical reasoning by linking symptoms, examination findings, and investigations.	C6	MCQs
		Radiology		• Appreciate the role of ultrasonography and imaging in evaluating the urinary system.	C2	MCQs
				• Apply renal anatomy to exclude obstruction, hydronephrosis, and structural abnormalities.	C6	MCQs
				• Correlate imaging findings with symptoms related to abnormal urine flow or renal pathology.	C6	MCQs
				• Understand the value of radiology in supporting the assessment of renal function and urinary tract disease.	C4	MCQs
		Family Medicine		• Recognize polyuria and nocturia as important symptoms commonly encountered in primary care.	C5	MCQs
				• Understand the importance of focused history-taking and early investigation in patients with urinary complaints.	C5	MCQs
				• Appreciate the role of primary care in identifying patients who may need further renal evaluation.	C5	MCQs
				• Develop an approach to early patient counseling and appropriate referral without requiring specialist-level knowledge.	C6	MCQs

Theme 3: Oliguria, Uremia & Acid–Base Disturbances (3rd Week)

Theme	Rationale	Learning objectives
Oliguria, Uremia & Acid–Base Disturbances	Teaching expands to renal pathophysiology, acid–base balance, and electrolyte homeostasis (K^+, Ca^{2+}, Na^+, PO_4^{3-}). Pathology content on nephrotic syndrome, UTI, and CKD progression explains uremic symptoms, fatigue, confusion, and hypertension. Pharmacology of diuretics and dialysis concepts vertically integrate medicine and surgery, highlighting why patients develop reduced urine output, acidosis, hyperkalemia, and volume overload. The week reinforces clinical reasoning behind dialysis indications, renal bone disease, and acute emergencies such as arrhythmias and encephalopathy.	After completing this theme, learners should be able to: • After completing this theme, learners should be able to: • Define oliguria and describe normal urine output in adults. • Explain the physiological regulation of urine formation, including renal blood flow, glomerular filtration rate (GFR), and tubular reabsorption. • Describe the role of body fluid compartments and effective circulating volume in maintaining adequate urine output. • Explain the hormonal control of urine production, including the roles of ADH, renin–angiotensin–aldosterone system (RAAS), and natriuretic peptides. • Differentiate between prerenal, renal, and postrenal causes of oliguria using basic physiological principles. • Describe the anatomical basis of urinary tract obstruction, including the kidneys, ureters, bladder, and urethra. • Integrate biochemical, physiological, and anatomical concepts to explain oliguria in conditions such as dehydration, acute kidney injury, shock, and obstructive uropathy. • Apply basic science knowledge to interpret clinical findings related to reduced urine output.

Case 3: Reduced Urine Output (Oliguria)

A 45-year-old male presents to the emergency department with complaints of passing very little urine for the past 24 hours. He reports feeling extremely weak and dizzy and has had multiple episodes of vomiting and diarrhea over the last two days. Despite drinking small amounts of water, he notes that his urine output has become markedly reduced.

On examination, the patient appears dehydrated, with dry oral mucosa and reduced skin turgor. His blood pressure is low, and pulse rate is increased. Abdominal examination is unremarkable, and there is no suprapubic distension.

Laboratory and Basic Investigations

- Urine output: < 400 mL/day
- Urine specific gravity: Increased
- Blood urea: Elevated

- Serum creatinine: Mildly elevated
- Serum electrolytes: Mild hypernatremia
- Renal ultrasound: Normal-sized kidneys, no evidence of obstruction
- **Clinical Correlation**

The patient's oliguria is due to reduced effective circulating volume caused by dehydration. Decreased renal perfusion leads to a reduction in GFR, activating compensatory mechanisms such as RAAS and ADH, which increase water and sodium reabsorption in the renal tubules. These physiological responses reduce urine output in an attempt to preserve intravascular volume.

This scenario demonstrates how renal physiology, hormonal regulation, fluid balance, and kidney anatomy interact to produce oliguria, helping students understand the basic science mechanisms underlying prerenal acute kidney injury.

Educational Relevance for Second-Year MBBS

This theme helps students:

Link renal physiology with a common clinical symptom

Understand why urine output falls in dehydration and shock

Apply GFR and tubular function concepts to patient care

Develop early clinical reasoning using basic sciences only

Entrustable Professional Activities (EPAs)

EPA-1: Obtain focused history and perform examination in oliguria

- Assess duration of oliguria, fluid losses, intake, and systemic symptoms.
- Evaluate hydration status, blood pressure, pulse, and signs of obstruction.
- Entrustment Level: Level 1–2

EPA-2: Explain physiological regulation of urine output

- Correlate renal perfusion, GFR, RAAS activation, ADH release, and fluid balance with oliguria.
- Entrustment Level: Level 2

EPA-3: Interpret investigations and differentiate causes of oliguria

- Distinguish prerenal, renal, and postrenal causes using clinical findings, urine concentration, and imaging.
- Entrustment Level: Level 2

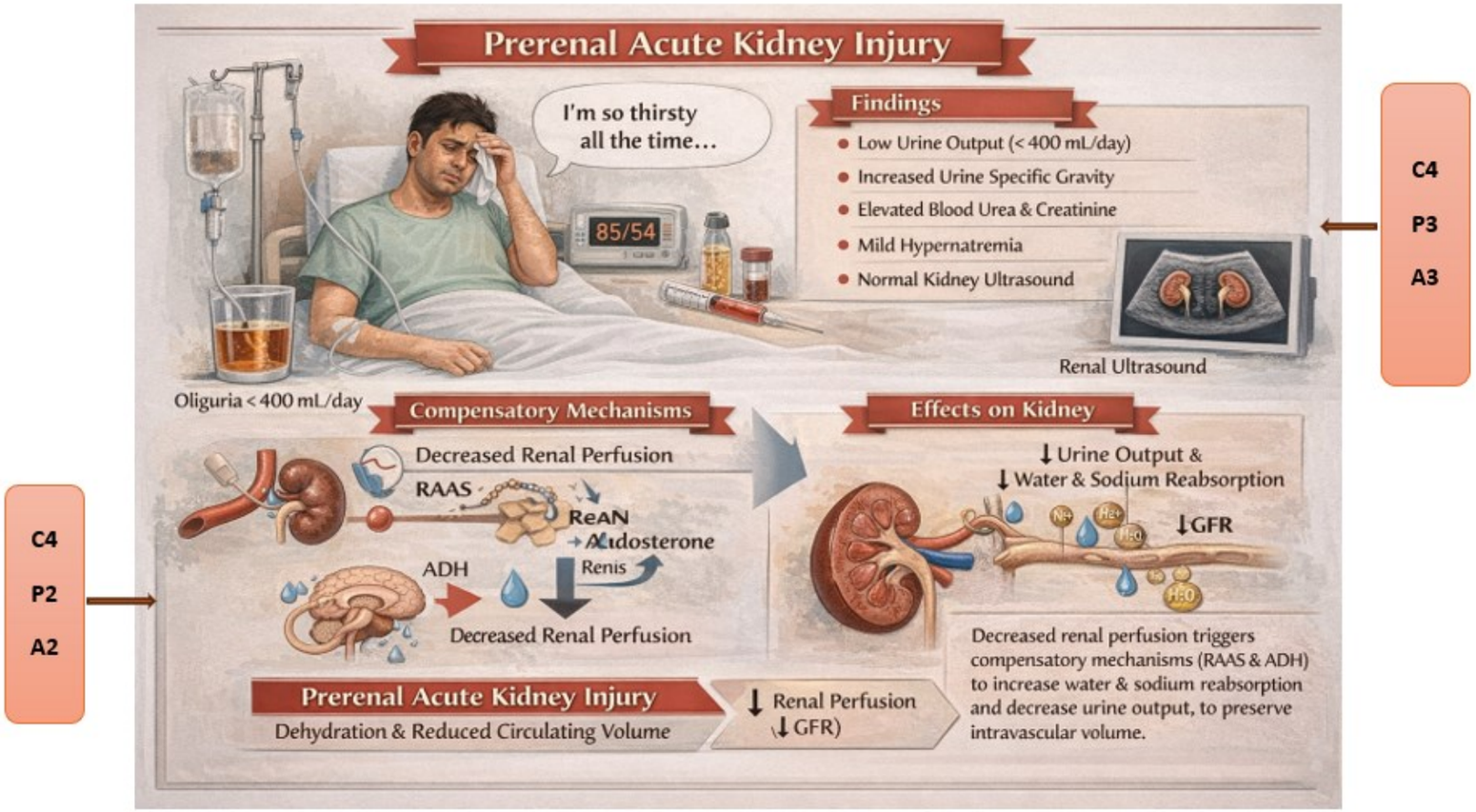
EPAs Detail Annexure-II

Justification:

This case reflects the highest level of curricular integration by simulating an emergency clinical presentation (oliguria due to dehydration/prerenal AKI). Students integrate Physiology (renal perfusion, RAAS and ADH activation, GFR decline), Anatomy (urinary tract evaluation to rule out obstruction), and Biochemistry (uremia, electrolyte imbalance) into one coherent explanation of the patient's condition. The case promotes holistic reasoning, interpretation of investigations, and

understanding of acute renal emergencies as encountered in real practice. This complete disappearance of discipline boundaries and focus on professional clinical competence aligns with **Harden Level 11**

Theme 3 Clinico-concept connect ($C^3$6)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Subject	Code	Topic	Learning Objectives At the End of The Lecture the Student Should Be Able To	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tool
Gross Anatomy	M2-Renal-A-0014	Cross Sectional Anatomy	• Identify different structures at different levels of vertebral coloumn; L2, L3, L4, L5	Must know	C2	SGD	OSPE MCQ SAQ VIVA
			• Correlate the clinical conditions at the given level	Should know	C3		
			• Understand the preventive and curative health care measures	Nice to Know	C3		
			• Practice the principles of Bioethics	Nice to Know	C3		
			• Apply Strategic use of AI in health care	Nice to Know	C3		
			• Read relevant research articles	Nice to Know	C3		
Gross Anatomy	M2-Renal-A-0015	Radiological Anatomy	• Identify structures on a normal X-ray abdomen	Should know	C2	SGD	OSPE MCQ SAQ VIVA
			• Identify kidney and its associated structures on contrast studies.	Should know	C2		
			• Appreciate filling defects.	Must know	C2		
			• Mark anatomical landmarks.	Must know	C2		
			• Understand the preventive and curative health care measures	Should know	C3		
			• Practice the principles of Bioethics	Nice to know	C3		
			• Apply Strategic use of AI in health care	Nice to Know	C3		
			• Read relevant research articles	Nice to know	C3		
			• Correlate the clinical conditions	Nice to know	C3		
Anatomy (SKL)	M2-Renal-A-0026	Urinary bladder	• Identify the histological slide of urinary bladder.	Must know	P	Skill Lab	OSPE
			• Illustrate the histological structure of urinary bladder	Should know	C2		
			• Enlist two points of identification.	Must know	C1		
			• Focus the slide • Analyze microscopic features to accurately differentiate urinary bladder from other hollow viscera.	Must know Nice to know	P C4		
Physiology (LGIS)	M2-Renal-P-007		• Concept of Glomerulo tubular Balance • Peritubular capillary and Renal interstitial fluid	Must know Should know	A B	C1 C2	LGIS SGD	SAQ MCQ

		Regulation of tubular reabsorption	Physical forces. • Mechanism of Pressure natriuresis and Pressure diuresis	Must know	A		Group presentations	VIVA
	M2-Renal-P-0011	Clearance methods	• Define Renal clearance	Should Know	B	C1	SGD	MCQ SEQ VIVA OSPE
			• Enumerate & Explain clearance methods to quantify renal functions	Must Know	A	C1		
			• Explain filtration fraction	Nice to Know	C	C2		
	M2-Renal-P-0012	Acid base balance	• Describe mechanism of action of buffer systems of body fluid	Must Know	A	C1	SGD	MCQ SEQ VIVA OSPE
			• Discuss buffering power of respiratory & renal system	Must Know	A	C2		
			• Explain the acid base disorders	Must Know	A	C2		
Physiology (LGIS)	M2-Renal-P-0020	**B.** Clearance methods to quantify kidney function **C.** Micturition reflex & Abnormalities of micturition	• 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	❖ 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)					
Physiology (SKL)	M2-Renal-P-0021	Specific gravity of Urine	• Apparatus identification	Must Know	A	C1	Skill lab	OSPE
			• Principle	Must Know	A	C1		
			• Procedure	Must Know	A	P, A		
			• Precautions	Should Know	B	C1		
			• Use of urinometer	Should Know	B	C1		
			• Recall normal values of specific gravity	Nice to Know	C	C1		

Biochemistry (LGIS)	M2-Renal-B-016	Acid Base Imbalance-II	• Reframe causes and compensation of Respiratory acid base disorders • Categorize related acid base disorders • Design the curative and preventive healthcare measures. • Read a relevant research article • Use HEC digital library	Must Know	C5 C4 C6 C2 C3	LGIS	MCQs, SAQs SEQs Viva
	M2-Renal-B-017	Potassium Metabolism	• Describe Daily requirements, sources, functions & their deficiency and toxic effects on body • Design the curative and preventive healthcare measures. • Apply the use of artificial intelligence in healthcare • Read a relevant research article • Use HEC digital library	Must Know	C2 C6 C3 C2 C3	LGIS	MCQs, SAQs SEQs Viva
Biochemistry (SGD)	M2-Renal-B-018	Metabolic Acidosis	• Describe metabolic acidosis	Must Know	C2	SGD	MCQs
Biochemistry (SDL)	M2-Renal-B-019	Clinical conditions related to potassium metabolism	• Describe the clinical conditions related to potassium metabolism	❖ Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#29, Page 448-449.			
Biochemistry (SKL)	M2-Renal-B-020	Urine analysis-II	• Perform tests to detect abnormal constituents of urine (proteins, ketone bodies, bile salts)	Must Know	P	Skill Lab	OSPE
Gynae & Obs	M2-Renal-VI(OBG)-001	Physiological Changes in the Renal System in Pregnancy & UTI	• The anatomic and functional changes in the renal system in pregnancy	C2		LGIS	MCQs
			• The changes in indices of renal function during pregnancy	C2			
Pharmacology	M2-Renal-VI(Pharm)-001	Introduction to diuretics	• Understanding the mechanism of action of diuretics in altering renal function to promote urine production.	C2		LGIS	MCQs
			• Identifying the major classes of diuretics, their pharmacokinetics, clinical indications, and potential side effects.	C2			

			• Exploring the role of diuretics in managing conditions such as hypertension, edema, and congestive heart failure	C2		
Medicine	M2-Renal-VI(M)-003	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		
Radiology	M2-Renal-VI(R)-001	Role of Ultrasound X Ray & CT in Renal Systematic Causes	• Describe the principles of imaging modalities: Ultrasound, X-ray, and CT scan.	C2	LGIS	MCQs
			• Identify the normal anatomy of kidneys on ultrasound.	C2		
	M2-Renal-VI(R)-002	Radiological Evaluation of Oliguria and Renal Failure	• Describe the role of imaging modalities (Ultrasound, X-ray, CT) in the evaluation of oliguria and renal failure. •	C2	LGIS	MCQs
			• List common radiological findings in acute and chronic kidney disease.	C2		
Peads	M2-Renal-VI(Peads)-001	UTI	• Define Urinary Tract Infection (UTI) and its classification (e.g., uncomplicated vs. complicated).	C2	LGIS	MCQs
			• Explain the mechanism of infection, including the role of pathogens, host defense mechanisms, and predisposing factors.	C2		
			• Understand the differences between gram-positive and gram-negative organisms causing UTIs.	C2		

Spiral Courses (3rd Week)

Family Medicine

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M2-Renal-SI(FMed)-001	Renal Failure	• Describe presenting complains of patients with Renal failure • Disscus complications of Renal failure • Describe intial treatment of patients with Renal failure • Know when to refer patient to consultant/ Hospital	C3	LGIS-1	MCQs

Integrated Undergraduate Research Curriculum (IUGRC)

Code	Topic	Learning Objectives	Cognitive Domain	Teaching Strategy	Assessment Tool
M2-Renal-SI(IUGRC)-004	**Research Club Activity 4** Manuscript Writing	• Interpret & apply basic principles of manuscript writing of research report • Perceive authorships requirements or rules of drafting manuscript of a research report for publication in indexed journal • Write discussion section of draft • Explain conclusion, recommendation and acknowledge part of research report • clarify types of citations included in discussion section	C3 C2 C2 C2 C2	LGIS	MCQs

The Pak Studies

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(PKS)-003	The foundation of the Muslim community	• Understand the Historical and Theological Foundation of the Muslim Community:	C2	LGIS	SAQ
		• Discuss the Role of Social Responsibility in the Muslim Community:	C2		

The Islamiayat

Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M1-GIT-SI(ISL)-003	Aqida Akhirat, its meaning, necessity, and wisdom	• Understand the concept of Aqida Akhirat (belief in the Hereafter), its meaning, and how this belief shapes moral and ethical principles, including its relevance to fostering responsibility and compassion in the medical profession.	C2	LGIS	SAQ
		• Discuss the necessity of Aqida Akhirat in providing a sense of purpose, accountability, and motivation for positive actions, and explore the wisdom behind its teachings in guiding medical professionals toward ethical decision-making and patient care.	C2		

Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C³6) Sessions for 3rd Week

Session	Topic	Department	Educational Relevance	At the End of The Demonstration Student Should Be Able To	Learning Domain	Assessment Tool
Clinico-Concept Connect (C³6) Sessions - III	Oliguria, Uremia & Acid–Base Disturbances	Anatomy	This theme is relevant for second-year MBBS students because it helps them understand the basic science basis of reduced urine output in dehydration and shock. It promotes integration of foundational knowledge with early clinical interpretation, while remaining within the level expected in the preclinical years.	• Identify the major parts of the nephron involved in filtration, reabsorption, and urine concentration.	C2	MCQs
				• Describe the anatomical relationship of the glomerulus, renal tubules, and collecting ducts in urine formation.	C2	MCQs
				• Relate renal blood supply to the kidney's role in maintaining filtration.	C5	MCQs
				• Apply knowledge of urinary tract anatomy to distinguish reduced urine formation from urinary outflow obstruction.	C6	MCQs
		Physiology		• Explain how dehydration and shock reduce renal perfusion and lead to decreased urine output.	C2	MCQs
				• Describe the effect of reduced blood volume and blood pressure on glomerular filtration rate (GFR).	C3	MCQs
				• Discuss the role of tubular reabsorption in conserving water and sodium during dehydration.	C3	MCQs
				• Explain the physiological actions of ADH and the renin–angiotensin–aldosterone system (RAAS) in maintaining fluid balance.	C3	MCQs
		Biochemistry		• Explain the biochemical basis of fluid and electrolyte imbalance in dehydration.	C4	MCQs
				• Understand the significance of urea and creatinine as markers of renal function.	C4	MCQs
				• Relate changes in osmolarity and solute concentration to urine concentration mechanisms.	C5	MCQs
				• Describe how altered renal perfusion affects the body's handling of metabolic waste products.	C4	MCQs
		Medicine		• Recognize oliguria as an important clinical sign in dehydration and shock.	C2	MCQs
				• Correlate reduced urine output with changes in circulatory volume and renal perfusion.	C4	MCQs

				• Interpret common patient complaints and signs using basic physiological principles.	C5	MCQs
				• Develop early clinical reasoning by linking symptoms with underlying renal mechanisms.	C5	MCQs
		Radiology		• Understand the role of ultrasound in assessing kidney size and urinary tract patency.	C2	MCQs
				• Recognize the value of imaging in excluding obstruction or hydronephrosis in a patient with low urine output.	C4	MCQs
				• Correlate basic renal anatomy with its appearance on common imaging studies.	C4	MCQs
				• Appreciate radiology as an adjunct to clinical and physiological assessment of renal function.	C5	MCQs
		Family Medicine		• Identify reduced urine output as an important warning sign in dehydrated or critically ill patients.	C5	MCQs
				• Take a focused history related to fluid loss, intake, and associated symptoms.	C5	MCQs
				• Understand the role of early recognition and timely referral in patients with possible renal hypoperfusion.	C6	MCQs
				• Counsel patients and attendants regarding hydration status and danger signs requiring urgent assessment.	C6	MCQs

Transdisciplinary, Interdisciplinary & Multidisciplinary Case Based Learning (CBL)

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

Anatomy LGIS Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At the End of The Lecture The Student Should Be Able To	Calgary Gauge	Learning Domain	References
Embryology					
M2-Renal-A-0027	Development of Kidney & ureter	• Enumerate the derivatives of intermediate mesoderm, urogenital and gonadal ridges.	Must know	C1	1.KLM Embryology Developing Human 11th Edition 2. USMLE Q Bank Step 1 (Volume 1) 2023-2034 3.UWORLD Step 1 (Volume 3) 2023-2024
		• Describe the stages of development of human kidneys	Must know	C2	
		• Describe the molecular regulation of kidney development.	Nice to know	C2	
		• Correlate positional changes of the kidney with its blood supply	Must know	C1	
		• Describe different stages of development of ureter from ureteric bud and metanephrogenicblastema.	Must know	C1	
		• Understand the bio-physiological aspects of kidney & ureter development	Must know	C2	
		• Enumerate Congenital anomalies of kidney and ureter.	Must know	C3	
		• Correlate the clinical conditions (polycystic kidney, horseshoe shaped kidney)	Should know	C3	
		• Understand the preventive and curative health care measures	Nice to know	C3	
		• Practice the principles of Bioethics	Nice to know	C3	
		• Apply strategic use of AI in health care	Nice to know	C3	
		• Read relevant research article	Nice to know	C3	
M2-Renal-A-0028	Development of urinary bladder & urethra	• Describe the development of urinary bladder	Must know	C2	1.Embryology**:** - KLM Embryology Developing Human 11th Edition 2. USMLE Q Bank Step 1 (Volume 1) 2023-2034 3. UWORLD Step 1 (Volume 3) 2023-2024
		• Understand the bio-physiological aspects of bladder development	Must know	C2	
		• Discuss the parts of urethra in males and females	Must know	C2	
		• Describe development of male urethra	Must know	C2	
		• Describe development of female urethra	Must know	C2	
		• Discuss the anomalies related to urethra & bladder development	Should know	C3	
Histology					
		• Discuss the structural components of the nephron.	Must know	C2	

M2-Renal-A-0029	Histology of kidney I (Cortex & Medulla)	• Discuss the histology of filtration barrier.	Must know	C2	1.Histology:-Junqueira's Basic Histology 18th Edition 2.USMLE Q Bank Step 1 (Volume 1) 2023-2034 3.UWORLD Step 1 (Volume 3) 2023-2024
		• Understand the bio-physiological aspects of filtration	Must know	C2	
		• Distinguish the key microscopic components of the renal cortex and medulla.	Must know	C2	
		• Differentiate the histological appearance of proximal tubule, loop of Henley, distal convoluted tubule and collecting duct.	Must know	C2	
		• Correlate the clinical conditions	Should know	C3	
		• Understand the preventive and curative health care measures	Should know	C2	
		• Practice the principles of Bioethics	Nice to know	C3	
		• Apply strategic use of AI in health care	Nice to know	C3	
		• Read relevant research article	Nice to know	C3	
M2-Renal-A-0030	Histology of kidney II (Collecting System)	• Enumerate the component cells of the juxta glomerular apparatus.	Should know	C1	1.Histology :-Junqueira's Basic Histology 18th Edition 2.USMLE Q Bank Step 1 (Volume 1) 2023-2034 3.UWORLD Step 1 (Volume 3) 2023-2024
		• Discuss the component cells of the juxtaglomerular apparatus	Must know	C1	
		• Discuss the effect of diabetes & hypertension on glomerular filtration rate	Should know	C2	
		• Understand the effect of hypertension on renin angiotensin release	Should know	C3	
M2-Renal-A-0031	Histology of Urinary Bladder	• Describe histological characteristics of urinary bladder.	Must know	C2	1.Histology :-Junqueira's Basic Histology 18th Edition 2.USMLE Q Bank Step 1 (Volume 1) 2023-2034 3.UWORLD Step 1 (Volume 3) 2023-2024
		• Explain the concept of umbrella cells and Uroplakins.	Must know	C2	
		• Explain the concept of internalization	Must know	C2	
		• Understand the bio-physiological effects of urinary epithelium	Must know	C2	
		• Compare the histological changes of empty and full bladder.	Must know	C2	
		• Correlate the clinical conditions	Should know	C2	
		• Understand the preventive and curative health care measures	Nice to Know	C2	
		• Practice the principles of Bioethics	Nice to Know	C2	
		• Apply strategic use of AI in health care	Nice to Know	C2	
		• Read relevant research article	Nice to Know	C2	
		• Describe the microscopic structure of ureter	Must know	C2	

M2-Renal-A-0032	Histology of ureter & urethra	• Discuss the histological features of urethra	Must know	C2	1. Histology: -Junqueira's Basic Histology 18th Edition 2.USMLE Q Bank Step 1 (Volume 1) 2023-2034 3.UWORLD Step 1 (Volume 3) 2023-2024
		• Distinguish the transition in epithelium in different types of urethra	Must know	C2	
		• Correlate the clinical conditions	Should know	C3	
		• Understand the preventive and curative health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research article	Nice to Know	C3	

Anatomy SGDs Syllabus of Learning Management System (LMS)

Code	Topics	Learning Objectives Students Should Be Able To	Calgary Gauge	Learning Domain	References
M2-Renal-A-0033	Posterior abdominal wall I (Fascia & Muscles)	• Describe the fascia of posterior abdominal wall	Must know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 537-541). ❖ https://www.youtube.com/watch?v=5ZnlcZrC-XY
		• Tabulate the muscles of posterior abdominal wall with reference to, origin, insertion, nerve supply and action.	Must know	C2	
		• Describe the relations of Psoas major muscle.	Should Know	C2	
		• Correlate the clinical conditions (Psoas Abscess)	Should know	C3	
		• Understand the preventive and curative health care measures	Should Know	C3	
		• Map Root of mesentery on SP/Model	Should Know	C3	
		• Practice the principles of Bioethics	Should Know	C3	
		• Apply Strategic use of AI in health care	Nice to know	C3	
M2-Renal-A-0034	Posterior abdominal wall II (Nerves)	• Trace the nerves present on posterior abdominal wall	Must know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 527-532).
		• DI Discuss the formation of nerves	Must know	C2	
		• Discuss the formation of lumbosacral plexus	Must know	C2	
		• Correlate the clinical conditions (Lumbar	Should know	C3	

		symphathectomy)			❖ https://www.youtube.com/watch?v=5ZnlcZrC-XY
		• Understand the preventive and curative health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply Strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research articles	Nice to Know	C3	
M2-Renal-A-0035	Posterior abdominal wall III (vessels) & Lumbar Vertebrae	• Enlist branches of Abdominal Aorta.	Must know	C1	❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 541-544, 544-547). https://www.youtube.com/watch?v=pSDYlPzNg4s
		• Describe the tributaries of inferior vena cava.	Must know	C2	
		• Describe lymph nodes of posterior abdominal wall with emphasis on lumbar and intestinal trunk.	Must know	C2	
		• Differentiate between typical and atypical lumbar vertebrae.	Must know	C2	
		• Identify different parts of lumbar vertebrae.	Must know	C2	
		• Discuss the attachments of lumbar vertebrae.	Nice to Know	C2	
		• Correlate the clinical conditions (abdominal aortic aneurysm)	Should know	C3	
		• Understand the preventive and curative health care measures	Must know	C3	
		• Map Abdominal aorta, Inferior Vena cava & Portal vein on simulated patient (SP)/Model	Must know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply Strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research articles	Nice to Know	C3	
M2-Renal-A-0036	Kidney	• Discuss the site and extent of kidneys	Must know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 515-517,523-524). https://www.youtube.com/watch?v=ZVlVquVYGDo
		• Differentiate right from left kidney	Must know	C2	
		• Understand the bio-physiological aspects of kidney	Must know	C2	
		• Discuss the renal capsule and its role in support of kidney.	Must know	C2	
		• Describe the structure of cortex and medulla	Must know	C2	

		• Describe peritoneal relationship of both kidneys.	Must know	C2	
		• Describe visceral relationship of both kidneys	Must know	C2	
		• Explain blood supply of both kidneys with emphasis on renal artery.	Must know	C2	
		• Discuss the venous drainage of both kidneys.	Must know	C2	
		• Correlate the clinical conditions (perinephric abscess, nephroptosis, renal cysts and renal colic)	Should know	C3	
		• Understand the preventive and curative health care measures	Nice to know	C3	
		• Map the kidney on the back (Morrison's Parrallelogram) on SP/Model	Nice to know	C3	
		• Practice the principles of Bioethics	Nice to know	C3	
		• Apply Strategic use of AI in health care	Nice to know	C3	
		• Read relevant research articles	Nice to know	C3	
M2-Renal-A-0037	Ureter	• Discuss extent and course of ureter in abdomen and pelvis in males and females	Must know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 5, Page 517-518,525). https://www.youtube.com/watch?v=1P0utMb5nkg
		• Explain peritoneal reflections of ureter in both sexes.	Must know	C2	
		• Describe relations of ureter.	Should know	C2	
		• Describe the arterial, venous and lymphatic drainage of ureter.	Nice to know	C2	
		• Correlate the clinical conditions (ureteric colic)	Nice to know	C3	
		• Understand the preventive and curative health care measures	Must know	C3	
		• Map Ureter from the back on SP/Model	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply Strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research articles	Nice to Know	C3	
		• Describe the location & visceral relations of right and left supra renal glands	Must know	C2	❖ Clinical Oriented Anatomy by Keith L.

M2-Renal-A-0038	Supra renal gland	• Understand the bio-physiological aspects of kidney	Must know	C2	Moore.8TH Edition. (Chapter 5, Page 519-523). https://www.youtube.com/watch?v=iE8nCvLaGM4
		• Discuss supra renal cortex and medulla	Must know	C2	
		• Discuss vessels and nerves of supra renal gland	Must know	C2	
		• Correlate the clinical conditions	Should know	C3	
		• Understand the preventive and curative health care measure	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply Strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research articles	Nice to Know	C3	
M2-Renal-A-0039	Urinary bladder	• Interpret size and extent of urinary bladder in different ages and states.	Must know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 6, Page 591-595). https://www.youtube.com/watch?v=tGouMldaQgU
		• Discuss the peritoneal and visceral relationships of urinary bladder(bladder bed)	Must know	C2	
		• Understand the bio-physiological aspects of kidney	Must know	C2	
		• Discuss the trigone of urinary bladder	Must know	C2	
		• Elaborate nerve supply of urinary bladder	Must know	C2	
		• Correlate the clinical conditions (urinary incontinence, suprapubiccystotomy and atonic bladder	Should know	C3	
		• Understand the preventive and curative health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to know	C3	
		• Apply Strategic use of AI in health care	Should know	C3	
		• Read relevant research article	Nice to know	C3	
		• Describe different parts of male and female urethra.	Must know	C2	❖ Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 6, Page 595).
		• Explain blood supply, innervation and lymphatics of urethra in both sexes	Must know	C2	

M2-Renal-A-0040	Urethra	• Discuss the clinically significant differences between male and female urethra	Must know	C2	https://www.youtube.com/watch?v=EQUdo392wg0
		• Correlate the clinical conditions	Should know	C3	
		• Understand the preventive and curative health care measures	Must know	C3	
		• Practice the principles of Bioethics	Nice to know	C3	
		• Apply Strategic use of AI in health care	Nice to know	C3	
		• Read relevant research articles	Nice to know	C3	
M2-Renal-A-0041	Cross Sectional Anatomy	• Identify different structures at different levels of vertebral coloumn;L2,L3,L4,L5	Must know	C2	• Gross Anatomy :- KLM clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034 UWORLD Step 1 (Volume 3) 2023-2024
		• Correlate the clinical conditions at the given level	Should know	C3	
		• Understand the preventive and curative health care measures	Nice to Know	C3	
		• Practice the principles of Bioethics	Nice to Know	C3	
		• Apply Strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research articles	Nice to Know	C3	
M2-Renal-A-0042	Radiology	• Identify structures on a normal X-ray abdomen	Should know	C2	• Gross Anatomy :- KLM clinically oriented anatomy edition 10 • USMLE Q Bank Step 1 (Volume 1) 2023-2034 UWORLD Step 1 (Volume 3) 2023-2024
		• Identify kidney and its associated structures on contrast studies.	Should know	C2	
		• Appreciate filling defects.	Must know	C2	
		• Mark anatomical landmarks.	Must know	C2	
		• Understand the preventive and curative health care measures	Should know	C3	
		• Practice the principles of Bioethics	Nice to know	C3	
		• Apply Strategic use of AI in health care	Nice to Know	C3	
		• Read relevant research articles	Nice to know	C3	
		• Correlate the clinical conditions	Nice to know	C3	

Anatomy Practicals Syllabus of Learning Management System (LMS)

Code	Topic	At the End of Practical Students Should Be Able To	Calgary Gauge	Learning Domain	Assessment Tool
M2-Renal-A-0043	Kidney	• Identify the histological slide of kidney.	Must know	C3	1.Histology Junqueira's Basic Histology 18th Edition 2.USMLE Q Bank Step 1 (Volume 1) 2023-2034 3.UWORLD Step 1 (Volume 3) 2023-2024
		• Illustrate the histological structure of Kidney.	Should know	C2	
		• Enlist two points of identification.	Must know	C2	
		• Focus the slide	Must know	C3	
M2-Renal-A-0044	Ureter	• Identify the histological slide of ureter	Must know	C2	1.Histology Junqueira's Basic Histology 18th Edition 2.USMLE Q Bank Step 1 (Volume 1) 2023-2034 3.UWORLD Step 1 (Volume 3) 2023-2024
		• Illustrate the histological structure of ureter.	Should know	C2	
		• Enlist two points of identification.	Must know	C1	
		• Focus the slide	Must know	C3	
M2-Renal-A-0045	Urinary bladder	• Identify the histological slide of urinary bladder.	Must know	P	Histology: -Junqueira's Basic Histology 18th Edition 2.USMLE Q Bank Step 1 (Volume 1) 2023-2034 3.UWORLD Step 1 (Volume 3) 2023-2024
		• Illustrate the histological structure of urinary bladder	Should know	C2	
		• Enlist two points of identification.	Must know	C1	
		• Focus the slide	Must know	P	

Physiology Syllabus of Learning Management System (LMS)

Code	Topics	Learning Objectives	Calgary Model	Mode of Assessment	Tool of Assessment
M2-Renal-P-0022	Body fluid compartments, Volume & osmolarity of ECF & ICF.	• Fluid Intake/Output balance • Body fluid compartments • Constituents of ECF & ICF • Concept of Osmolarity, Osmolality, Osmosis and Osmotic pressure	Nice to know (C)	SDL	MCQs
M2-Renal-P-0023	Physiology of Renal system, Glomerular filtration rate	• Functions of kidney. • Physiologic Anatomy of Kidney • Concept of Glomerular Filtration • Introduction to Glomerular filtration rate.	Must Know (A)/ Should know (B)	LGIS& SDL	MCQs
M2-Renal-P-0024	Abnormalities of fluid volume & regulation, Edema	• 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	Should know (B)	LGIS&SDL	MCQs
M2-Renal-P-0025	Regulation of GFR & RBF-I (Determinants of GFR & RBF)	• Glomerular filtration rate & Renal Blood flow • Determinants of GFR • Determinants of RBF	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs
‘ M2-Renal-P-0026	Excretion of dilute urine	• Mechanism of Excretion of Excess water through Dilute Urine. • Role of ADH (Anti-Diuretic Hormone) • Renal mechanism for excreting dilute urine.	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs
M2-Renal-P-0027	Regulation of GFR & RBF-II, Physiological control of GFR and RBF, Auto regulation of GFR and RBF/Macula densa feedback mechanism	• Physiological control of GFR and RBF. • Auto regulation of GFR and RBF. • Tubulo-glomerular Feedback Mechanism • Macula-densa Feedback Mechanism	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs
M2-Renal-P-0028	Excretion of concentrated urine (Counter current multiplier)	• Concentrated urine and Conservation of water. • Counter-current multiplier and counter current exchanger mechanism. • Osmoreceptor-ADH feedback mechanism • Specific gravity of urine and Importance of thirst.	Must Know (A)	LGIS&SDL	MCQs

M2-Renal-P-0029	Tubular reabsorption & secretion along various parts of nephrons	• Tubular reabsorption & secretion in Proximal tubule • Loop of Henle • Distal tubule & collecting tubule. • Active and passive transport mechanisms	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs

Biochemistry Syllabus of Learning Management System (LMS)

Code	Topic	Learning Objectives At The End Of Lecture Students Should Be Able To	Calgary Category	Learning Domain	Learning Resources	Assessment Tool
M2-Renal-B-0033	Introduction to protein metabolism	Understand protein turn-over, amino acid pool and entry of amino acid into cell.	Should Know	C2	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs
M2-Renal-B-0034	Nitrogen balance	Describe positive and negative nitrogen balance	Should Know	C2	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs
M2-Renal-B-0035	General reactions of amino acids	Discuss reactions of amino acids Interpret the clinical importance of transaminases	Should Know Must Know	C2 C3	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs
M2-Renal-B-0036	Urea cycle And its disorders	Describe the location, steps and regulation of Urea cycle Describe Disorders of the urea cycle	Should Know Should know	C2 C3	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs

M2-Renal-B-0037	Metabolism of glycine	Explain Glycine metabolism and related disease	Should Know	C2	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs
M2-Renal-B-0038	Metabolism of tyrosine	Explain tyrosine metabolism Discuss related inherited disorders	Should Know	C2 C3	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs
M2-Renal-B-0039	Metabolism of Tryptophan	Explain Tryptophan metabolism Discuss related inherited disorders	Should Know Must Know	C2	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs
M2-Renal-B-0040	Metabolism of methionine	Describe metabolism of sulfur containing amino acids Discuss related disorders	Should Know Must Know	C2 C2	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs
M2-Renal-B-0041	Metabolism of branched chain amino acids	Explain Metabolism of branched chain amino acids Discuss related inherited disorders	Should Know Must Know	C2 C2	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs
M2-Renal-B-0042	Metabolism of polyamines	Discuss Synthesis of polyamines and their clinical significance	Should Know Must Know	C2	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Google scholar articles https://scholar.google.com/	MCQs

M2-Renal-B-0043	Phenylalanine Metabolism	Explain phenylalanine Metabolism in detail Highlight the Disorders	Should Know Nice to Know	C2 C3	• Harper's Textbook Of biochemistry 32nd Edition • Lippincott Biochemistry 8th edition (chapter 19) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3854183/	MCQs
M2-Renal-B-0044	Ammonia	Explain sources of NH_3 formation and its transport Describe Metabolism Discuss Ammonia Toxicity interpret the related disorders	Must Know Must Know Must Know Nice to Know	C3 C2 C3 C3	• Lippincott illustrated Biochemistry 8th Edition • Harper's Textbook of Biochemistry 32nd Edition • Harper's illustrated biochemistry 32nd edition (Chapter 40 page 477) https://link.springer.com/article/10.1007/BF00998474 https://www.youtube.com/watch?v=JX6wPV4JHJ4&t=77s https://www.ncbi.nlm.nih.gov/books/NBK546677/	MCQs
M2-Renal-B-0045	Phenylalanine and Tyrosine	Clinical disorders related to Phenylalanine and tyrosine metabolism	Must Know	C2	• Lippincott Biochemistry 8th edition (chapter 19 page – 271) • https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3854183/	MCQs
M2-Renal-B-0046	Arginine & Branched Chain Amino Acid Metabolism	Explain Metabolism of branched chain amino acids Discuss related inherited disorders	Should Know Must Know	C1 C2	• Harper's illustrated biochemistry 32nd edition (Chapter 40 page 477) • https://link.springer.com/article/10.1007/BF00998474	MCQs

Transdisciplinary, Interdisciplinary & Multidisciplinary Case Based Learning (CBL)

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

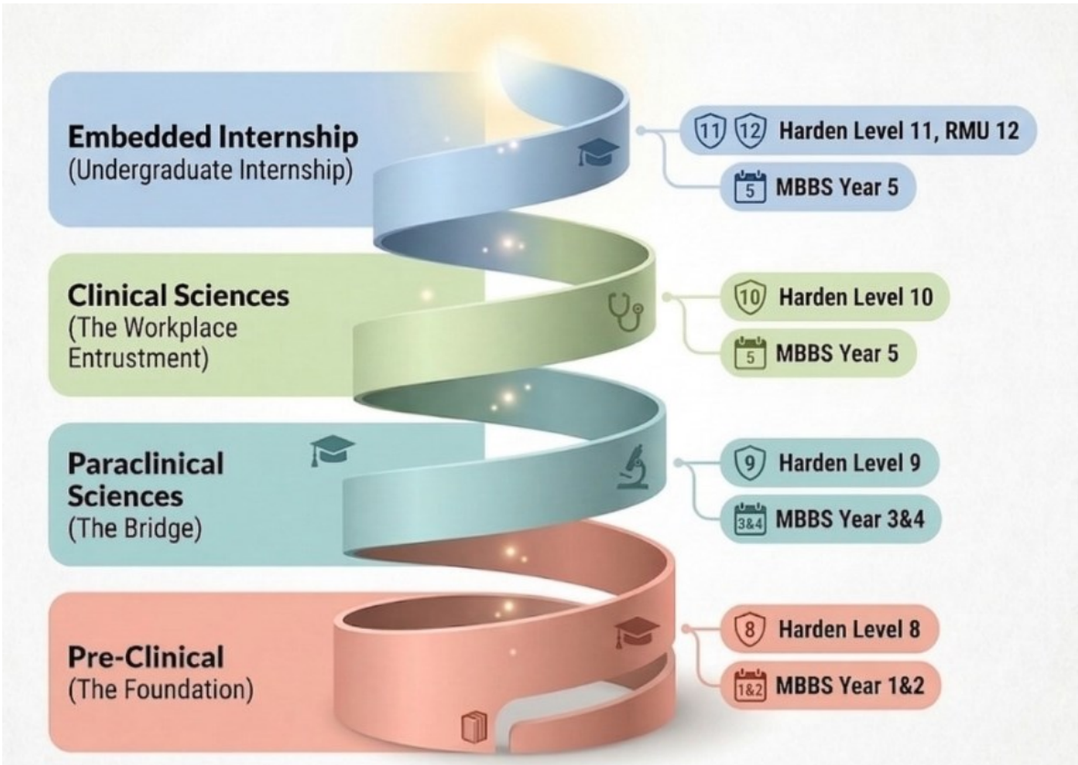
SECTION – VI

- **Block-V**
- **Reproduction Module-I**
- **Central Nevers System Module-I**

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

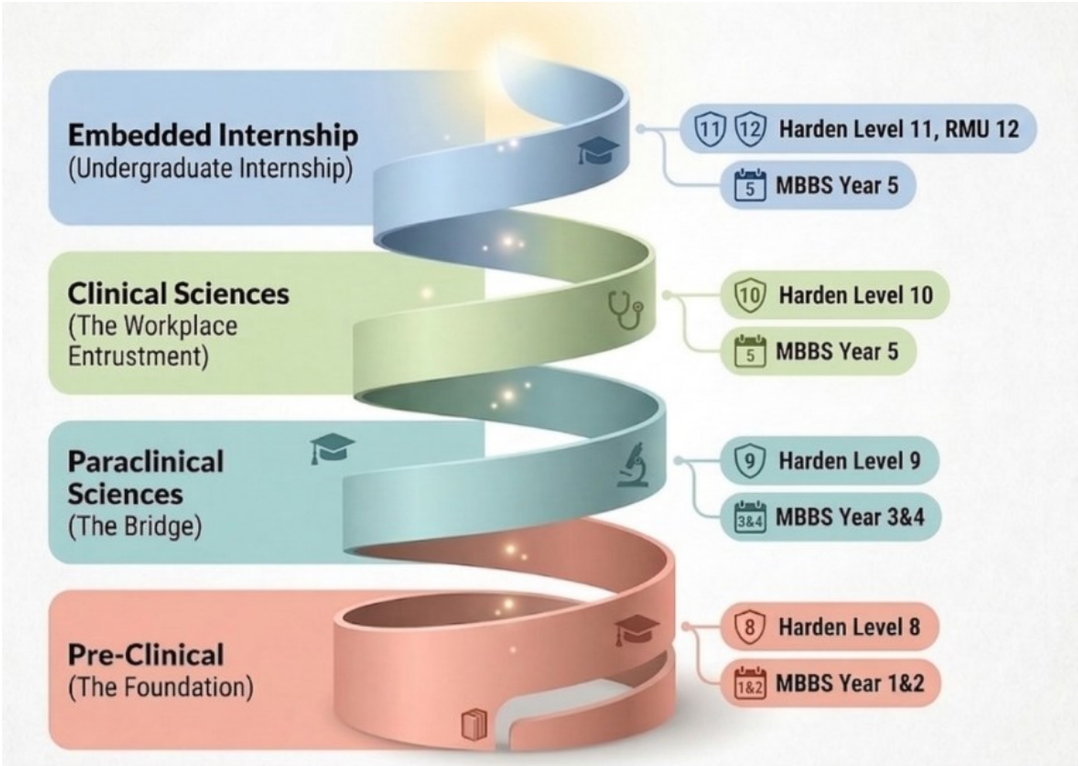


➢ Reproduction Module-I

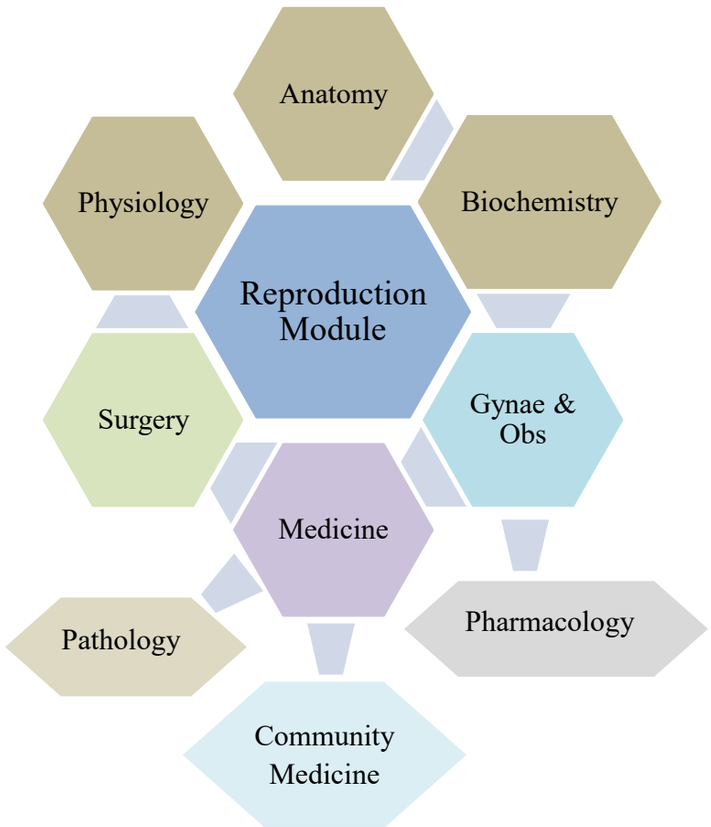
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Integrated Modular MBBS Curriculum 2026

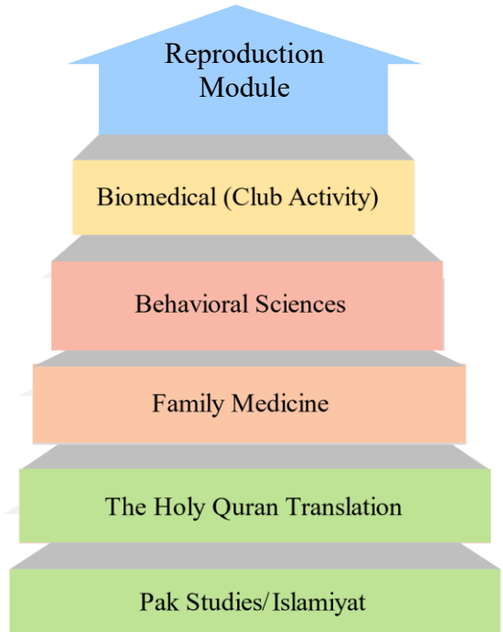
Isolation to Beyond Boundaries



Integration



Disciplines in Reproduction Module-I



Spiral / General Education Cluster Courses

Discipline Wise Details of Modular Contents

Block	Subjects	Embryology	Histology	Gross Anatomy
V	• Anatomy	Embryology/Development • Testis • Genital Ducts • Prostate & Accessory Glands • Uterus & Uterine tubes • Ovary & Vagina	Histology • Testis • Genital Ducts • Prostate & Accessory Glands • Uterus & Uterine Tubes • Ovary & Vagina	• 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
	• Biochemistry	• Digestion of nucleic acid & biosynthesis of purines • Purine catabolism and related disorders • Pyrimidine metabolism • Regulation of gene expression • Male Gonadal Hormones • Female Gonadal Hormones		
	• Physiology	• 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		

		• 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	
	• Community Medicne (CHEPI)	• Introduction to health education and communication • Preventive aspect of STDs • Preventive aspect of AIDS • Personal hygiene (hand, eye, oral) • Prevention of dengue
	• Islamiyat	• 7) Sharing the verses related to the unity of the Ummah and the need for unity • 8) Verses related to enjoining what is right and forbidding what is wrong, and the need for enjoining good and forbidding evil along with its principles and methods • 9) Qualities of successful people
	• Family Medicine	• AIDS
	• Pak Studies	• 6) The Ideology of Pakistan and Quaid-e-Azam • 8) Islami c democracy • 9) The economic system of Islam
	• Behavioural Sciences	• Emotion • Intelligence
	Vertical Integration	
	• Gynae & Obs	• Normal Menstrual Cycle & Its Abnormalities • Menstrual irregularities • Puerperium & Lactation
	• Pharmacology	• Hormonal Contraceptives
	• Surgery	• Undescended Testes & Scrotan Swellings • Male hypogonadism / Acute Scrotum
	• Pathology	• BPH/Prostatitis / Sexually Transmitted Diseases • Polycystic Ovaries
	Early Clinical Exposure (ECE)	

	• Gynecology	• Ovarian Tumors • Uterine Tumors • Polycystic Ovaries • Menstrual Irregularities
	• Obstetrics	• Important points in History of pregnant lady • Obstetrics Trimesters • Fetal heart sounds
	• Surgery	• Testicular Tumors • Hydrocele • Undescended Testis • Hypospadias/ Epispadias

Reproduction Module-I Team

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

Module Committee		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar
2.	Director DME & Dean Basic Sciences	Prof. Dr. Ifra Saeed
3.	Additional Director (Assessment) DME	Dr. Arsalan Manzoor Mughal
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar
5.	Chairperson Anatomy	Prof. Dr. Ayesha Yousaf
6.	Chairperson Biochemistry	Dr. Aneela Jamil
7.	Focal Person Anatomy 2nd Year MBBS	Dr. Maria Tasleem
8.	Focal Person Physiology	Dr. Sidra Hamid
9.	Focal Person Pharmacology	Dr. Zunera Hakim
10.	Focal Person Pathology	Dr. Syeda Ayesha
11.	Focal Person Behavioral Sciences	Dr. Zona Tahir
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom
13.	Focal Person Quran Translation Lectures	Dr. Fahd Anwar
14.	Focal Person Family Medicine	Dr. Sadia Khan

Module Task Force Team		
1.	Coordinator	Dr. Sheena Tariq (Senior Demonstrator of Physiology)
2.	DME Focal Person	Dr. Farzana Fatima
3.	Co-coordinator	Dr. Tariq Furqan (Senior Demostrator of Anatomy)
4.	Co-Coordinator	Dr. Jawad Hassan (Senior Demonstrator of Physiology)
5.	Co-coordinator	Dr. Sana Latif (Demonstrator of Biochemistry)

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

Module III – Reproduction Module-I

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 psycosocial 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 condusive 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.
- Demostrate awareness of ethical, legal and social implecation of issues related to bioethics

Attitude

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

This module will run in 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!

Themes, Learning Objectives, Teaching Strategies & Tool of Assessments

Contents

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

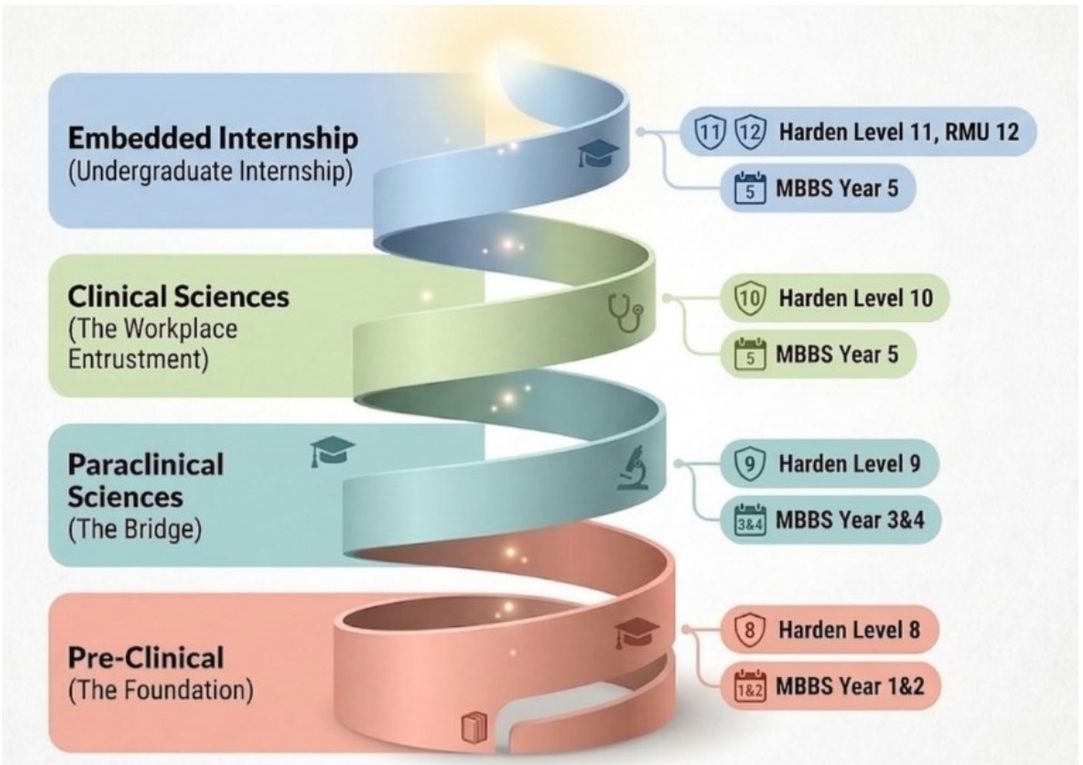
- **Syllabus Reproduction Module-I 2026**

  Second Year MBBS

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



Reproduction Module – I – Second Year MBBS

Duration of Module (Three Weeks)

Sr No.	Themes	Duration
1.	Primary Infertility & Menstrual Irregularities	1st Week
2.	Patient with Pelvic Pain & Hormonal Dysfunction	2nd Week
3.	Pregnancy Loss and Disorders of Sexual Development	3rd Week

Theme 1: Primary Infertility & Menstrual Irregularities. (1st Week)

Theme	Rationale	Learning objectives
Primary Infertility & Menstrual Irregularities	Weekly sessions cover ovarian and endometrial cycles, spermatogenesis, pelvic anatomy, contraception, endocrine control, and prostate structures. Together, these explain the clinical basis of infertility, anovulation, dysmenorrhea, and other menstrual disturbances.	By the end of this session, students should be able to: • Explain female infertility as a consequence of integrated dysfunction of the hypothalamic-pituitary-ovarian axis, ovarian morphology, and metabolic disturbances. • Describe the pathophysiological basis of anovulation, irregular menstrual cycles, hyperandrogenism, and subfertility in polycystic ovarian syndrome. • Interpret the clinical presentation, hormonal profile, and ultrasound findings in a patient with PCOS-related infertility. • Correlate obesity, insulin resistance, and androgen excess with impaired follicular maturation and reproductive dysfunction. • Discuss the structural, functional, biochemical, and pathological changes occurring in the ovaries and endometrium in chronic anovulation. • Recognize the short- and long-term reproductive, metabolic, and endometrial complications associated with PCOS. • Demonstrate empathetic, ethical, and patient-centered communication while addressing infertility-related distress and social pressure.

Case 1: "When the Cycle Fails – A Systems Approach to Female Infertility"

A 25-year-old woman, Mrs. A, presents to the infertility clinic with her husband with a history of primary infertility. The couple has been married for three years and has been trying to conceive for the past two years without success. She appears anxious during the consultation and expresses emotional distress, stating that her menstrual cycles have never been regular and sometimes occur after gaps of two months. She also feels embarrassed due to increased facial hair and reports social pressure from family members frequently asking about childbearing. She attained menarche at the age of 13 years, and since adolescence her cycles have remained irregular, typically occurring every 40–60 days with moderate flow and no significant dysmenorrhea. Over the past four years, she has experienced progressive weight gain of approximately 10 kilograms, along with acne, increased facial hair growth, and occasional mood swings. There is no history of pelvic infections, thyroid disease, galactorrhea, or prior surgical procedures. Notably, her elder sister also experienced difficulty in conceiving.

ON Examination it was observed:

- BMI: 31 kg/m²
- Mild hirsutism
- Acne over jawline
- Acanthosis nigricans over neck
- Normal blood pressure
- Pelvic exam: Normal-sized uterus, no adnexal mass

Investigations:

Hormonal Profile:

- LH: Elevated
- FSH: Normal
- LH/FSH ratio: >2
- Serum Testosterone: Mildly elevated
- Serum Prolactin: Normal
- TSH: Normal
- Fasting Insulin: Elevated

Ultrasound Pelvis:

- Bilaterally enlarged ovaries
- Multiple small peripheral follicles
- Increased stromal echogenicity

She asks:

"Doctor, why is my body not functioning normally? Is it my fault?"

Entrustable Professional Activities (EPAs)

EPA-1: Interpret laboratory and imaging findings and apply basic science to explain infertility. (Level 2)

EPA-2: Communicate the diagnosis and its underlying mechanism in simple, understandable language. (Level 2–3)

EPA-3: Demonstrate professionalism, empathy, and sensitivity while addressing the patient's concerns. (Level 2)

EPAs Detail Annexure-II

Justification:

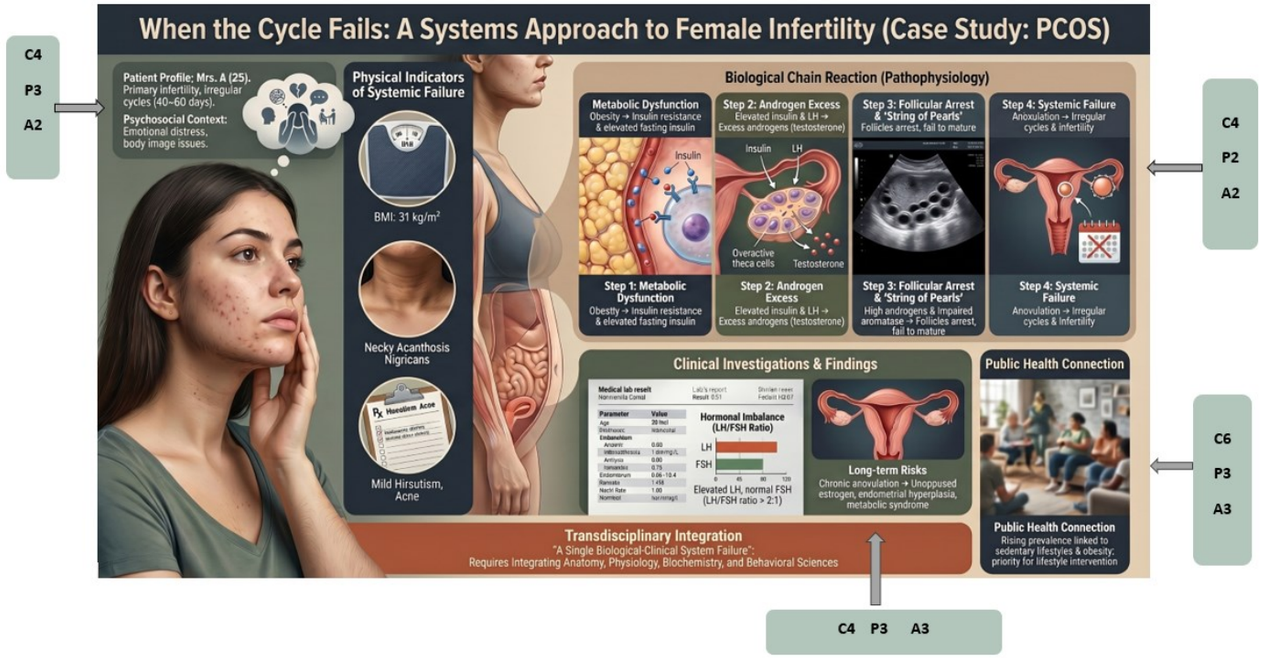
No subject is taught independently.

Students do not identify "this is physiology" or "this is biochemistry."

The patient problem drives learning.

Molecular → Structural → Hormonal → Clinical → Psychosocial → Public health layers are integrated.
Faculty function as co-facilitators rather than subject lecturers. This represents true **transdisciplinary integration**

Theme 1 Clinico-concept connect (C^36)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Subject	Code	Topic	Learning Objectives At the end of lecture students should be able to	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tools
Anatomy Embryology	M3-Repro-A-001	Testis	• Recall the time of early sex differentiation and genes involved in it.	Must know	C2	LGIS	MCQS SAQS VIVA
			• Explain the development of male gonads and formation of testis.	Must know	C2		
			• Describe the descent of testis.	Must know	C2		
			• Describe the concepts of chromosomal determination of sex, primordial germ cells and indifferent gonads.	Must know	C2		
			• Describe histogenesis of interstitial cells of leydig and seminiferous tubules.	Must know	C2		
			• Correlate with the clinical conditions	Must know	C2		
			• Understand curative and preventive health care measures.	Must know	C3		
			• Practice the principles of bioethics.	Should know	P		
			• Apply strategic use of A.I in health care.	Should know	C3		
			• Read relevant research article	Nice to know	C3		
			• Analyze the step-by-step process of how early genes (SRY and SOX9) trigger the development of key cells (Sertoli and Leydig) to turn the indifferent gonad into a testis.	Should know	C4		
			• Evaluate the clinical implications of an embryological failure in testicular descent (cryptorchidism).	Must know	C5		
			• Formulate a step-by-step diagnostic algorithm for a neonate presenting with disorders of sex development (ambiguous genitalia), integrating your knowledge of normal testicular embryogenesis, the role of anti-Müllerian hormone (AMH), and early testosterone production.	Nice to know	C6		
Anatomy Embryology	M3-Repro-A-002	Male external genitalia	• Explain the different stages and further development of external genitalia.	Must know	C2	LGIS	MCQS SAQS

			• Discuss the related clinical like ambiguous genitalia, Androgen insensitivity syndrome, hypospadias, epispadias, bifid penis, micropenis	Must know	C2		VIVA
			• Understand curative and preventive health care measures.	Must know	C2		
			• Practice the principles of bioethics.	Must know	C2		
			• Apply strategic use of A.I in health care.	Must know	C2		
			• Read relevant research article.	Must know	C2		
Anatomy Embryology	M3-Repro-A-003	Uterus and uterine tubes	• Describe role of paramesonephric ducts, uterovaginal primordium in development of uterine tubes	Must know	C2	LGIS	MCQS SAQS VIVA
			• Discuss the role of paramesonephric ducts and uterovaginal primordium in the development of uterus.	Must know	C2		
			• Discuss the related clinicals like bicornuate uterus, unicornuate uterus, double uterus.	Must know	C2		
			• Analyze the chronological steps involved in the fusion of paired paramesonephric ducts and apoptosis of midline septum to form a single, unified uterine cavity.	Must know	C4		
			• Evaluate the clinical presentation of specific congenital Müllerian anomalies	Must know	C5		
			• Formulate a diagnostic and patient counseling pathway for a young adult presenting with primary amenorrhea	Must know	C6		
			• Read relevant research article	Must know	C3		
Anatomy (LGIS)	M3-Repro-A-006	Testis	• Discuss germ cells at different steps of spermatogenesis in the seminiferous tubule.	Must know	C2	LGIS	MCQS SAQS VIVA
			• Describe histology of Sertoli cells and Leydig cells.				
			• Explain their roles in the production of sperm and regulation of the male reproductive system.	Must know	C2		
			• Understand the bio-physiological aspects of spermatogenesis.	Must know	C2		

			• Discuss the related clinicals like orchitis, male infertility, testicular cancers, and cryptorchidism.	Must know	C2		
			• Evaluate testicular biopsy micrographs to assess the integrity of the seminiferous epithelium.	Must know	C5		
			• Understand curative and preventive heath care measures.	Should know	C3		
			• Practice the principles of bioethics.	Nice to know	P		
			• Apply strategic use of A.I in health care.	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
	M3-Repro-A-008	Accessory male reproductive glands	• Describe the histological organization of prostate gland, seminal vesicles and bulbourethral glands.	Must know	C2	LGIS	MCQS SAQS VIVA
			• Describe microscopic features of these glands.	Must know	C2		
			• Discuss the related clinical like prostatitis.	Should know	C3		
			• Understand curative and preventive health care measures.	Nice to know	C3		
			• Practice the principles of bioethics.	Nice to know	C3		
			• Apply strategic use of A.I in health care.	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
			• Recollect knowledge of histological features of endometrium in various phases	Must know	C2		
	M3-Repro-A-009	Uterus and uterine tubes	• Discuss microanatomy of layers of uterus	Must know	C2		
			• Describe parts of uterine tubes	Should know	C3		
			• Explain microscopic features of all parts of uterine tubes.	Nice to know	C3		
			• Discuss the related clinicals like endometriosis, tubal ligation, salpingitis, and cervical cancers	Nice to know	C3		
			• Understand curative and preventive health care measures.	Nice to know	C3	LGIS	MCQS SAQS VIVA
			• Differentiate the regional mucosal variations of uterine tube and the hormone-driven cyclic changes of the endometrium	Nice to know	C4		

			• Evaluate microscopic sections of uterine endometrium to accurately identify the specific phase of the menstrual cycle	Nice to know	C5		
			• Formulate a clinico-histological framework that correlates specific microscopic abnormalities in the uterus or uterine tubes	Nice to know	C6		
Anatomy (SGD)	M3-Repro-A-0011	Sacrum	• Identify the bone	Must know	C2	SGD	MCQS SAQS OSPE VIVA
			• Place the bone in anatomical position	Must know	C2		
			• Demonstrate anatomical features on bone	Must know	C2		
			• Discuss attachments and relations on bone	Must know	C2		
			• Discuss important clinical anatomy of bone	Should know	C2		
			• Understand curative and preventive health care measures	Nice to Know	C3		
			• Analyze the gross anatomical differences between the male and female sacrum.	Nice to Know	C4		
			• Evaluate lumbosacral radiographs to assess the alignment of the sacroiliac joints	Nice to Know	C5		
			• Formulate a clinically safe, step-by-step anatomical approach for administering a caudal epidural block.	Nice to Know	C6		
	M3-Repro-A-0012	Bony pelvis	• Identify type of pelvis	Must know	C2	SGD	MCQS SAQS OSPE VIVA
			• Place pelvis in anatomical position	Must know	C2		
			• Demonstrate different diameters of each type	Must know	C2		
			• Differentiate bony features of each type	Must know	C2		
			• Clinical importance of each type	Should know	C2		
			• Understand curative and preventive health care measures	Nice to Know	C3		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3	Skill Lab	MCQS SAQS OSPE VIVA
Anatomy Histology	M3-Repro-A-0013	Pelvic Peritoneum and its contents	• Identify visceras present in pelvis	Must know	C2		
			• Demonstrate peritoneal reflections on pelvic visceras	Must know	C2		
			• Discuss pouches formed by peritoneum	Must know	C2		

			• Discuss clinical anatomy of pelvic peritoneum and pelvic visceras	Must know	C3		
			• Understand curative and preventive health care measures	Should know	C2		
			• Analyze the specific anatomical reflections of the pelvic peritoneum	Nice to Know	C4		
			• Evaluate the anatomically dependent position of the rectouterine (Pouch of Douglas).	Nice to Know	C5		
			• Formulate a safe, anatomically guided procedural plan for performing a culdocentesis	Nice to Know	C6		
	M3-Repro-A-0014	Pelvic diaphragm	• Identify the muscles forming pelvic diaphragm	Must know	C2	Skill Lab	MCQS SAQS OSPE VIVA
			• Demonstrate the attachments and nerve supply of muscles of pelvic diaphragm	Must know	C2		
			• Locate the structures piercing the pelvic diaphragm	Must know	C2		
			• Discuss clinical anatomy of pelvic diaphragm	Must know	C3		
			• Understand curative and preventive health care measures	Should know	C2		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3		
	M3-Repro-A-0015	Male external genitalia	• Identify the anatomical structures of external genitalia	Must know	C2	Skill Lab	MCQS SAQS OSPE VIVA
			• Demonstrate anatomical position of testis	Must know	C2		
			• Enlist layers of scrotum with its neurovasculature	Must know	C2		
			• Discuss clinical anatomy of scrotum	Must know	C3		
			• Understand curative and preventive health care measures	Should know	C2		
			• Analyze the distinct muscular components of the levator ani complex	Nice to Know	C4		
			• Evaluate the anatomical integrity of the pelvic diaphragm following obstetric trauma.	Nice to Know	C5		
			• Formulate an anatomically targeted rehabilitation protocol (such as Kegel	Nice to Know	C6		

			exercises) designed to selectively strengthen the puborectalis.				
	M3-Repro-A-0016	Testis	• Identify the structure	Must know	C2	Skill Lab	MCQS SAQS OSPE VIVA
			• Demonstrate anatomical position of testis	Must know	C2		
			• Discuss layers and structure of testis	Must know	C2		
			• Discuss important clinical anatomy related to testis	Must know	C3		
			• Understand curative and preventive health care measures	Should know	C2		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3		
	M3-Repro-A-0017	Male genital ducts	• Describe the anatomical position of vas deferens, seminal vesicles, ejaculatory ducts on model	Must know	C2	Skill Lab	MCQS SAQS OSPE VIVA
			• Discuss the anatomical relations of vas deferens, seminal vesicles, ejaculatory ducts	Must know	C2		
			• Discuss clinical anatomy	Must know	C3		
			• Understand curative and preventive health care measures	Must know	C2		
			• Practice the principles of bioethics.	Should know	C2		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3		
	M3-Repro-A-0018	Prostate	• Identify the position of prostate	Must know	C2	Skill Lab	MCQS SAQS OSPE VIVA
			• Demonstrate the anatomical features and relations of prostate	Must know	C2		
			• Discuss clinical anatomy	Must know	C3		
			• Analyze the topographic relationships between the anatomical zones of the prostate, the prostatic urethra, and the ejaculatory ducts	Must know	C4		
			• Evaluate the anatomical contours and median sulcus palpable during a digital rectal examination.	Should know	C5		

			• Formulate a clinico-anatomical framework that maps the distinct gross lobes and zones of the prostate.	Nice to Know	C6		
			• Read a relevant research article	Nice to Know	C3		
	M3-Repro-A-0019	Ovaries	• Identify the site of ovarian fossa	Must know	C2	Skill Lab	MCQS SAQS OSPE VIVA
			• Discuss anatomical relations of ovary	Must know	C2		
			• Discuss neurovasculature and hormonal effects of ovaries	Must know	C2		
			• Discuss important clinical anatomy of ovary	Must know	C3		
			• Understand curative and preventive health care measures	Should know	C2		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3		
	M3-Repro-A-0020	Fallopian tubes, Uterus	• Identify the location of structures in pelvis	Must know	C2	Skill Lab	MCQS SAQS OSPE VIVA
			• Demonstrate anatomical relations of these structures	Must know	C2		
			• Discuss normal positions of uterus with its ligaments	Must know	C2		
			• Discuss its neurovasculature	Must know	C2		
			• Discuss important clinical anatomy of fallopian tubes, uterus and uterine tube	Should know	C2		
			• Understand curative and preventive health care measures	Nice to Know	C3		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3		
	M3-Repro-A-0021	Cervix	• Discuss anatomy of cervix	Must know	C2	Skill Lab	MCQS SAQS OSPE VIVA
			• Describe anatomical relations of cervix	Must know	C2		
			• Describe its neurovasculature	Must know	C2		
			• Understand curative and preventive health care measures	Must know	C3		
			• Analyze the close anatomical relationships of the supravaginal cervix to the ureters, bladder, and uterine arteries.	Should know	C4		

			• Evaluate the anatomical integrity of the transverse cervical (Mackenrodt's) to accurately assess a patient's clinical risk for uterine prolapse.	Nice to Know	C5		
			• Formulate a clinico-anatomical map that correlates the visual appearance of the external os.	Nice to Know	C6		
	M3-Repro-A-0047	Testis, Epididymis, Ductus deferens	• Identify the histological slide of testis, Ductus deferens and epididymis	Must know	P	Skill Lab	OSPE
			• Illustrate the microscopic picture of testis, Ductus deferens and epididymis	Should know	C2		
			• Enlist two points of identification of each	Must know	C1		
			• Read relevant research article	Nice to know	C3		
			• Use digital library	Nice to know	C3		
Physiology (LGIS)	M3-Repro-P-001	Physiological anatomy of male reproductivesystem & spermatogenesis	• DescribePhysiological anatomy of male reproductive system	C2	Must Know	A	LGIS	MCQ SEQ VIVA
			• Explainthestepsof spermatogenesis	C2	Must know	A		
			• Identifytheprocessof meiosis	C2	Should Know	B		
			• Describethehormonal factors that stimulate spermatogenesis	C2	Must know	A		
			• Describefunctionsof seminal vesicles	C2	Must know	A		
	M3-Repro-P-002	Physiological anatomy female reproductive system	• Describe oogenesis & follicular developmentin ovaries	C2	Must know	A	LGIS	MCQ SEQ VIVA
			• Discussfemalehormonal system	C2	Nice to know	C		
	M3-Repro-P-003	Semen, capacitation& acrosome reaction	• Explain capacitation	C2	Must Know	A	LGIS	MCQ SEQ VIVA
			• Describe acrosomal reaction	C2	Must know	A		
			• Summarize the abnormalities related to spermatogenesis: o Bilateral orchitis o Effects of temperature o Cryptorchidism	C2	Should Know	B		
	M3-Repro-P-004	MonthlyOvarian Cycle, ovulation	• Describe gonadotropic hormones & their effects on ovaries	C2	Must know	A	LGIS	MCQ SEQ VIVA
			• Explain follicular phase of ovarian cycle	C2	Must know	A		
			• Explain ovulation hormones	C2	Must know	A	LGIS	MCQ

			• Explain LH surge	C2	Nice to know	C		SEQ VIVA
			• Describe luteinizing function of Luteinizing	C 1	Nice to know	C		
Physiology (CBL)	M3-Repro-P-0014	Infertility	• Correlate basic knowledge with clinical application	C3	Should know	A	CBL	MCQ SEQ
Physiology (SDL)	M3-Repro-P-0017	Fertilization of ovum, transport, implantation, Functions of placenta	• Maturation and fertilization of ovum • Transport and Implantation • Early nutrition of the Embryo • Functions of Placenta	• 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) • https://teachmephysiology.com/reproductive- system/ • https://my.clevelandclinic.org/health/articles/11585-conception				
	M3-Repro-P-0018	Growth &functional development of fetus, Adjustments of infant to extrauterine life, Growth & development in child	• Growth & functional development of fetus • Fetal Metabolism • Changes in Fetal circulation at Birth • Adjustment of the Infant to the Extrauterine life	• 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.msdmanuals.com/home/women-s-health issues/normal-pregnancy/stages-of-development- of-the-fetus				
Physiology (SKL)	M3-Repro-P-0020	Examination of 7th Cranial nerve	• Principle • Procedure • Clinical correlation • Overview of Cranial nerves • Performance of student	Should know Should know Must know Nice to know Should know	A A B C A	C1 P3 C3 C1 P3	Skill Lab	OSPE

Biochemistry (LGIS)	M3-Repro-B-001	Gene Expression	• Explain the regulation of gene expression • Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics	Should Know	C2 C2 C3 C3	LGIS	MCQs, SAQs SEQs Viva
	M3- Repro-B-002	Digestion of nucleic acid and purine synthesis	• Explain digestion of nucleoprotein • Describe purine biosynthesis (Denovosynthesis and salvage pathway)	Must Know	C2 C2	LGIS	MCQs, SAQs SEQs Viva
			• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Must Know	C3 C3 C4 C2	LGIS	MCQs, SAQs SEQs Viva
Biochemistry (SGD)	M3-Repro-B-003	Deno synthesis of purine, describe salvage pathway (Purine Metabolism)	• Purine denovo synthesis and describe salvage pathway • Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Should Know	C2 C4 C3 C4 C2	SGD	MCQs
Biochemistry (SDL)	M3-Repro-B-004	Applied aspect of nucleic acid and purine synthesis	• Describe Role of Deficient enzymes • Relate Clinical Features & Investigation	C2 C4	• 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/		

	M3-Repro-B-005	Applied aspect of Regulation of gene expression	• Explain the regulation of gene expression • Relate with clinical disorders	C2 C4	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/		
Biochemistry (SKL)	M3-Repro-B-006	Estimation of serum Uric acid by Spectrophotometer	• Perform estimation of uric acid by spectrophometer	Should Know	P	Skill Lab	OSPE

Theme 2: Patient with Pelvic Pain & Hormonal Dysfunction. (2nd Week)

Theme	Rationale	Learning objectives
Patient with Pelvic Pain & Hormonal Dysfunction	Focus on undescended testes, scrotal swellings, sex hormone physiology, puberty disorders, BPH/prostatitis, and STDs. This knowledge supports clinical reasoning in patients presenting with pelvic pain, genital lumps, reproductive infections, and androgen/estrogen imbalance.	By the end of the session, students should be able to: • Explain pelvic pain and heavy menstrual bleeding in this case through integrated hormonal, structural, and vascular mechanisms. • Correlate the clinical presentation and examination findings with uterine fibroid. • Interpret ultrasound and laboratory findings in a patient with fibroid-related menorrhagia and anemia. • Describe the systemic consequences of chronic blood loss, particularly iron deficiency anemia and fatigue. • Discuss the effects of fibroid mass on adjacent pelvic organs and resulting pressure symptoms. • Demonstrate empathetic and patient-centered communication while addressing the patient's concerns and quality of life issues.

Case 2: "When the Uterus Speaks – Pelvic Pain as a Hormonal–Structural Disorder"

A 34-year-old woman, Mrs. S, presents to the Gynecology OPD with an eight-month history of progressive lower abdominal heaviness and excessive menstrual bleeding, accompanied by severe fatigue and difficulty performing her daily activities. She reports that her menstrual flow has become so heavy that she needs to change sanitary pads every hour and frequently passes clots. Her cycles are regular, occurring every 28 days, but the bleeding lasts for 8–10 days. She denies any intermenstrual bleeding.

In addition to menorrhagia, she complains of a persistent pelvic pressure sensation, urinary frequency, constipation, and occasional lower back pain. She feels constantly weak and states that she is unable to adequately care for her children due to her symptoms. Her obstetric history reveals three full-term vaginal deliveries with no history of miscarriages.

On general examination, the patient appears pale and mildly fatigued, with a pulse rate of 96 beats per minute. On abdominal examination, a palpable firm mass is noted in the midline of the lower abdomen. Pelvic examination reveals an enlarged, irregular uterus corresponding approximately to a 12-week gestational size. The uterus is non-tender on palpation, and no adnexal masses are detected.

Investigations:

- Hemoglobin: 8.2 g/dL
- Serum Ferritin: Low
- Thyroid profile: Normal
- Ultrasound pelvis: 6.5 cm intramural fibroid in anterior wall
- Endometrial thickness: Increased

She asks:

"Why is my uterus growing like this? Is this dangerous?"

Entrustable Professional Activities (EPAs)

EPA-1: Interpret laboratory and imaging data and apply integrated basic sciences to explain pelvic pathology. (Level 2)

EPA-2: Communicate findings clearly and compassionately in language appropriate for the patient. (Level 2–3)

EPA-3: Recognize the impact of the condition on patient quality of life and demonstrate professionalism and empathy. (Level 2)

EPAs Detail Annexure-II

Justification:

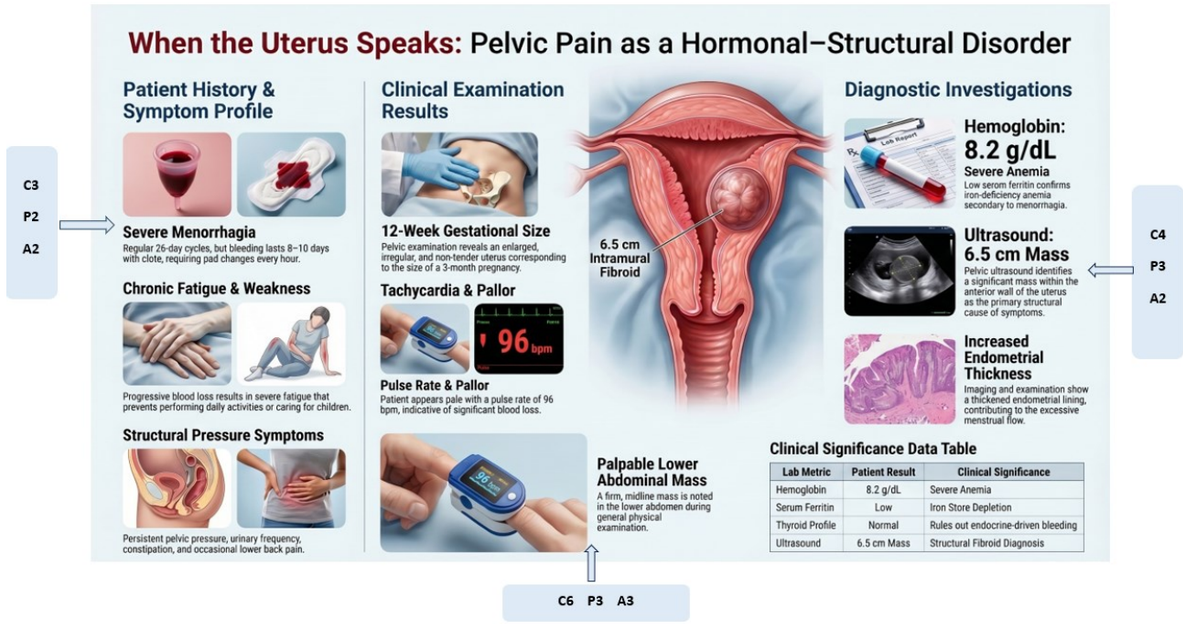
No discipline dominates the session.

Students approach pelvic pain as a biological system problem.

Hormonal, structural, vascular, systemic and psychosocial dimensions are unified.

Faculty from Anatomy, Physiology, Biochemistry and Gynae facilitate together. Learning is patient-driven, not subject-driven. This fulfills **true transdisciplinary integration**.

Theme 2 Clinico-concept connect ($C^3$6)



Harden Level 11 Transdisciplinary

Specific Learning Objective

Subject	Code	Topic	Learning Objectives At the end of lecture students should be able to	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tools
Anatomy Embryology	M3-Repro-A-004	Ovary	• Recall the process of oogenesis in female.	Must know	C2	LGIS	MCQS SAQS VIVA
			• Explain the different steps involved in early oogenesis.	Must know	C2		
			• Explain the ovarian and menstrual cycle and phases.	Must know	C2		
			• Explain the hormonal changes occurring during reproductive cycle.	Must know	C2		
			• Describe role of paramesonephric ducts, uterovaginal primordium in development of ovary	Must know	C2		
			• Analyze specific embryonic contributions of the coelomic surface epithelium, and migrating primordial germ cells to the formation of definitive ovarian follicles.	Must know	C4		
			• Understand curative and preventive health care measures	Must know	C3		
			• Practice the principles of bioethics.	Should know	P		
			• Evaluate the embryological impact of the absence of the SRY gene.	Should know	C5		
			• Link gonadal ridge development defects to the cause of congenital anomalies like gonadal dysgenesis.	Nice to know	C6		
Anatomy Embryology	M3-Repro-A-005	Vagina	• Discuss the developmental stages of vagina and female external genitalia	Must know	C2	LGIS	MCQS SAQS VIVA
			• Enlist different congenital anomalies of female reproductive system.	Must know	C3		
			• Describe different syndromes and gene defects associated with congenital anomalies	Should know	C3		
			• Understand curative and preventive health care measures	Nice to know	C3		
			• .	Nice to know	C3		
			• Apply strategic use of A.I in health care	Nice to know	C3		

			• Read a relevant research article	Must know	C3		
	M3-Repro-A-007	Male genital ducts	• Describe the histological organization of epididymis, ductus deferens and ejaculatory ducts.	Must know	C2	LGIS	MCQS SAQS VIVA
			• Describe the epithelium and microscopic features of epididymis, ductus deferens and ejaculatory ducts.	Must know	C3		
			• Understand the bio-physiological aspects of epithelium of ducts.	Should know	P		
			• Discuss the related clinical like vasectomy, epididymitis.	Nice to know	C3		
			• Understand curative and preventive health care measures.	Nice to know	C3		
			• Analyze the distinct variations in the epithelial lining and smooth muscle thickness along the progression of the male genital ducts.	Nice to know	C4		
			• Evaluate microscopic sections of the male reproductive tract to accurately differentiate the epididymis from the ductus deferens.	Nice to know	C5		
			• Formulate a clinico-histological framework that correlates specific microscopic structural anomalies in the male genital ducts	Nice to know	C6		
			• Describe microscopic features of these glands.	Must know	C2		
			• Discuss the related clinical like prostatitis.	Should know	C3		
			• Understand curative and preventive health care measures.	Nice to know	C3		
			• Practice the principles of bioethics.	Nice to know	C3		
			• Apply strategic use of A.I in health care.	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
			• Recollect knowledge of histological features of endometrium in various phases	Must know	C2		
Anatomy Histology	M3-Repro-A-0010	Ovary and Vagina	• Discuss the stages of follicular growth (primordial, primary, secondary, tertiary), as well as the changes that occur in the follicular wall.	Must know	C2	LGIS	MCQS SAQS VIVA
			• Discuss ovarian cycle and menstrual cycle.	Must know	C2		

			• Describe the histological features of corpus luteum of mensuration and pregnancy.	Must know	C2		
			• Discuss the related clinicals like PCOS, Follicular cyst, hemorrhagic cyst.	Should know	C3		
			• Analyze the histological features of ovarian cortex and medulla across different phases of the menstrual cycle.	Must know	C4		
			• Justify the use of ovarian histology in distinguishing between normal follicular development and pathological conditions like polycystic ovary syndrome.	Nice to know	C5		
			• Discuss the related clinical like vaginitis, squamous cell carcinoma of vagina.	Nice to know	C3		
			• Understand curative and preventive health care measures.	Nice to know	C3		
			• Design a labeled histological atlas entry that correlates microscopic structure of the ovary with its endocrine and gametogenic functions.	Nice to know	C6		
			• Apply strategic use of A.I in health care.	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
Gross Anatomy	M3-Repro-A-0022	Ischio-anal fossa	• Discuss the dimensions, boundaries and recesses	Must know	C2	SGD	MCQS SAQS OSPE VIVA
			• Describe the contents of Ischio anal fossa	Must know	C2		
			• Describe pudendal canal and its contents	Must know	C2		
			• Discuss important clinical anatomy of structures	Must know	C2		
			• Understand curative and preventive health care measures	Should know	C2		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3		
Gross Anatomy	M3-Repro-A-0023	Urogenital diaphragm	• Discuss the formation of diaphragm	Must know	C2		MCQS
			• Identify the relations and contents of diaphragm	Must know	C1		
			• Discuss organs piercing urogenital diaphragm	Must know	C2		

			• Discuss important clinical anatomy related to diaphragm	Should know	C2	SGD	SAQS OSPE VIVA
			• Understand curative and preventive health care measures	Nice to Know	C3		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3		
Gross Anatomy	M3-Repro-A-0024	Perineum & Superficial perineal pouches	• Identify boundaries and divisions of perineum	Must know	C2	SGD	MCQS SAQS OSPE VIVA
			• Discuss formation of perineal pouches	Must know	C2		
			• Discuss in detail the contents of superficial perineal pouches in male and female	Must know	C2		
			• Discuss important clinical anatomy related to superficial perineal pouches	Should know	C2		
			• Understand curative and preventive health care measures	Nice to Know	C3		
			• Analyze the boundaries and contents of the superficial perineal pouch in males versus females.	Nice to Know	C4		
			• Evaluate spread of infection or urine in a superficial perineal pouch injury based on its anatomical limits.	Nice to Know	C5		
			• Design a surgical approach to drain an abscess in the superficial perineal pouch while avoiding damage to neurovascular structures.	Nice to Know	C6		
Anatomy Histology	M3-Repro-A-0025	Deep perineal pouches	• Discuss in detail the contents of deep perineal pouches in male and female	Must know	C2	Skill Lab	MCQS SAQS OSPE VIVA
			• Discuss important clinical anatomy related to deep perineal pouches.	Must know	C2		
			• Understand curative and preventive health care measures	Should know	C2		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3		
	M3-Repro-A-0048		• Identify the histological slide of seminal vesicles and prostate	Must know	P		

		Seminal vesicles, prostate	• Illustrate the microscopic picture of seminal vesicles and prostate	Should know	C2	Skill Lab	OSPE
			• Analyze histological structure of the seminal vesicle and prostate gland in relation to their secretory functions.	Must know	C4		
			• Evaluate histological changes in the prostate (e.g., glandular hyperplasia or acinar atrophy)	Nice to know	C5		
			• Design a histology-based diagnostic flowchart to differentiate normal, hyperplastic, and malignant prostate tissue using microscopic features.	Nice to know	C6		
Physiology (CBL)	M3-Repro-P-0015	Menorrhagia	• Correlate basic knowledge with clinical application	Should know	A	C3	CBL	MCQ SEQ VIVA
Physiology (SGD)	M3-Repro-P-0016	Neonatal problems of Prematurity	• Correlate basic knowledge with clinical application	Should know	A	C3	SGD	MCQ SEQ VIVA
Physiology (SDL)	M3-Repro-P-0019	Hormonal factors in pregnancy, Special functional problems in neonate. Prematurity and its problems.	• Special functional problems in neonate • Prematurity • Immature development of the premature Infant • Instability of Homeostasis in Premature Infant Instability of body temperature in Infants	• 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				
Physiology (SKL)	M3-Repro-P-0021	Pregnancy Test	• Apparatus identification • Principle • Procedure • Precautions • Recall types of pregnancy test • Performance of student	Sould know Should know Shold know Must know Nice to know Should know	A A A B C A	P3/A3 C1 P3 C1 C1 P3	Skill lab	OSPE
	M3-Repro-P-0023	Examination of 3rd,4th,6th cranial nerves	• Principle • Procedure • Clinical correlation of reflexes	Should know Should know Should know Must know	A A A B	C1 P3 C3 C1	Skill lab	OSPE

			• Overview of cranial nerves				
Biochemistry (LGIS)	M3-Repro-B-007	Purine Catabolism	• Explain purine catabolism • Correlate causes and effects of disorders of purine catabolism • Reframe the mechanism of purine catabolism • Design the curative and preventive healthcare measures • Read a relevant research article • Use HEC digital library	Must Know	C2 C4 C5 C6 C2 C3	LGIS	MCQs, SAQs Viva
	M3-Repro-B-008	Male gonadal hormones	• Describe Synthesis, mechanism of action and functions of male gonadal hormones • Reframe related inherited disorders • Role play principles of bioethics • Design the curative and preventive healthcare measures. • Use HEC digital library	Must Know	C2 C5 C6 C6 C3	LGIS	MCQs, SAQs SEQs Viva
Biochemistry (CBL)	M3-Repro-B-009	Gout	• Reframe the mechanism of gout formation • Design the curative and preventive healthcare measures	Should Know	C5 C6	CBL	MCQs SAQs Viva
Biochemistry (SDL)	M3-Repro-B-010	Applied aspect of Male gonadal hormones	• Explain the Biochemical basis of Clinical Features • Relate the causes of hypersecretion & Hyposecretion Treatment	• 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/			
Biochemistry (SKL)	M3-Repro-B-011	Estimation of Cholesterol by Spectrophotometer	• Perform estimation of Cholesterol by Spectrophotometer	Should Know	P	Skill Lab	OSPE

Theme 3: Pregnancy Loss and Disorders of Sexual Development. (3rd Week)

Theme	Rationale	Learning objectives
Pregnancy Loss and Disorders of Sexual Development	Teaching includes fertilization, implantation, placentation, neonatal issues, PCOS, hypogonadism, hermaphroditism, acute scrotum and ovarian pathology. These concepts relate to presentations such as ambiguous genitalia, recurrent pregnancy loss, menstrual dysregulation, and neonatal morbidity.	By the end of the session, students should be able to: • Explain heavy menstrual bleeding and pelvic pain through integrated hormonal, structural, and vascular mechanisms. • Correlate the patient's clinical presentation and examination findings with uterine fibroid. • Interpret ultrasound and laboratory findings in a patient with fibroid-related menorrhagia and anemia. • Describe the effects of fibroid growth on the uterus and adjacent pelvic organs. • Explain iron deficiency anemia as a systemic consequence of chronic abnormal uterine bleeding. • Demonstrate empathetic and patient-centered communication while addressing the patient's concerns and quality of life.

Case 3: "When Implantation Fails – The Biology Behind Early Pregnancy Loss"

A 27-year-old woman, gravida 2 para 0, presents to the emergency department with vaginal bleeding at 10 weeks of gestation. She reports mild lower abdominal cramping for two days followed by spotting which has gradually increased. She had a previous miscarriage at 8 weeks one year ago. There is no history of diabetes, hypertension, thyroid disease, or trauma. She is deeply anxious and repeatedly asks, "Why does this keep happening? Is there something wrong with my body?" She denies fever or foul discharge. Her last menstrual period was regular, and pregnancy was confirmed with a positive home test six weeks earlier. She has been taking no medications except folic acid.

Clinical Examination

On general examination, she appears emotionally distressed but hemodynamically stable. Pulse is 84/min, blood pressure 110/70 mmHg, temperature normal. There is mild pallor but no jaundice or edema. Abdominal examination reveals mild suprapubic tenderness without guarding or rigidity. On speculum examination, minimal vaginal bleeding is noted. The cervical os appears closed. Bimanual examination shows a uterus slightly smaller than expected for gestational age, non-tender, with no adnexal masses.

Investigations

- Serum β-hCG levels are lower than expected for gestational age and show declining trend on repeat testing after 48 hours.
- Serum progesterone levels are reduced.
- Thyroid profile and prolactin levels are within normal limits.
- Complete blood count reveals mild anemia.
- Transvaginal ultrasound shows an intrauterine gestational sac without fetal cardiac activity and minimal subchorionic hemorrhage. No adnexal pathology is visualized.

Entrustable Professional Activities (EPAs)

EPA-1: Interpret laboratory and ultrasound findings and apply integrated basic sciences to explain pregnancy loss. (Level 2)

EPA-2: Communicate findings compassionately and explain the condition in a patient-centered manner. (Level 2–3)

EPA-3: Demonstrate professionalism, emotional sensitivity, and empathy in managing the patient encounter. (Level 2)

EPAs Detail Annexure-II

Justification:

Disciplines are not taught separately.

Students approach miscarriage as a unified biological and psychosocial phenomenon.

Molecular, endocrine, structural, vascular and emotional dimensions are integrated.

Faculty collaborate across departments without subject boundaries.

The patient narrative drives the learning, not the discipline. This fulfills true transdisciplinary integration under Harden Level 11.

Theme 3 Clinico-concept connect ($C^3$6)



Harden Level 11 Transdisciplinary

Specific Leaning Objective

Subject	Code	Topic	Learning Objectives At the end of lecture students should be able to	Calgary Gauge	Learning Domain	Teaching Strategy	Assessment Tools
Anatomy Embryology	M3-Repro-A-004	Ovary	• Recall the process of oogenesis in female.	Must know	C2	LGIS	MCQS SAQS VIVA
			• Explain the different steps involved in early oogenesis.	Must know	C2		
			• Explain the ovarian and menstrual cycle and phases.	Must know	C2		
			• Explain the hormonal changes occurring during reproductive cycle.	Must know	C2		
			• Describe role of paramesonephric ducts, uterovaginal primordium in development of ovary	Must know	C2		
			• Describe the descent of ovaries.	Must know	C2		
			• Understand curative and preventive health care measures	Must know	C3		
			• Practice the principles of bioethics.	Should know	P		
			• Apply strategic use of A.I in health care	Should know	C3		
			• Read a relevant research article	Nice to know	C3		
Anatomy Embryology	M3-Repro-A-005	Vagina	• Discuss the developmental stages of vagina and female external genitalia	Must know	C2	LGIS	MCQS SAQS VIVA
			• Enlist different congenital anomalies of female reproductive system.	Must know	C3		
			• Describe different syndromes and gene defects associated with congenital anomalies	Should know	C3		
			• Understand curative and preventive health care measures	Nice to know	C3		
			• Analyze embryonic origins of the upper versus lower vagina and their respective anomalies.	Nice to know	C4		
			• Evaluate type of vaginal anomaly based on the timing and site of a developmental arrest in sinovaginal bulb formation.	Nice to know	C5		
			• Design a table correlating specific embryologic defects of the paramesonephric ducts and sinovaginal bulbs.	Must know	C6		

Gross Anatomy	M3-Repro-A-0026	Blood supply of pelvis and perineum	• Identify major blood vessels & nerves of pelvis and perineum	Must know	C1	SGD	MCQS SAQS OSPE VIVA
			• Demonstrate anatomical relationships	Must know	C2		
			• Describe important clinical anatomy related to blood vessels of pelvis and perineum	Should know	C2		
			• Understand curative and preventive health care measures	Nice to Know	C3		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		
			• Read a relevant research article	Nice to Know	C3		
Gross Anatomy	M3-Repro-A-0027	Lymphatic drainage of pelvis and perineum	• Identify major lymphatic vessels of pelvis and perineum	Must know	C1	SGD	MCQS SAQS OSPE VIVA
			• Discuss lymphatic drainage of pelvis and perineum	Must know	C2		
			• Discuss important clinical anatomy	Should know	C2		
			• Understand curative and preventive health care measures	Nice to Know	C3		
			• Compare the lymphatic drainage pathways of the pelvic viscera versus the perineum.	Nice to Know	C4		
			• Evaluate pattern of lymph node metastasis from a carcinoma of the uterine cervix	Nice to Know	C5		
			• Design a clinical algorithm that traces the route of lymphatic spread from a perineal infection or malignancy.	Nice to Know	C6		
Gross Anatomy	M3-Repro-A-0028	Sacral and Coccygeal plexus	• Identify various branches of sacral and coccygeal plexus	Must know	C1	Skill Lab	MCQS SAQS OSPE VIVA
			• Discuss anatomical relations	Must know	C2		
			• Describe root values of each branch of plexus and its related applied	Should know	C2		
			• Understand curative and preventive health care measures	Nice to Know	C3		
			• Practice the principles of bioethics.	Nice to Know	C3		
			• Apply strategic use of A.I in health care	Nice to Know	C3		

			• Read a relevant research article	Nice to Know	C3		
	M3-Repro-A-0049	Ovary	• Identify the histological slide of ovary	Must know	P	Skill Lab	OSPE
			• Illustrate the microscopic picture of ovary	Should know	C2		
			• Enlist two points of identification	Must know	C1		
			• Read relevant research article	Nice to know	C3		
			• Use digital library	Nice to know	C3		
	M3-Repro-A-0050	Uterus, uterine tubes	• Identify the histological slide of Uterus and uterine tubes	Must know	P	Skill Lab	OSPE
			• Illustrate the microscopic picture of Uterus and uterine tubes	Should know	C2		
			• Compare the histological layers of the uterus and uterine tubes	Must know	C4		
			• Evaluate cyclical histological changes in the endometrium	Nice to know	C5		
			• Design a histology-based decision tree to differentiate normal endometrium (proliferative vs. secretory), and endometrial hyperplasia.	Nice to know	C6		
Physiology (CBL)	M3-Repro-P-0015	Menorrhagia	• Correlate basic knowledge with clinical application	Should know	A	C3	CBL	MCQ SEQ VIVA
Physiology (SGD)	M3-Repro-P-0016	Neonatal problems of Prematurity	• Correlate basic knowledge with clinical application	Should know	A	C3	SGD	MCQ SEQ VIVA
Physiology (SDL)	M3-Repro-P-0019	Hormonal factors in pregnancy, Special functional problems in neonate. Prematurity and its problems.	• Special functional problems in neonate • Prematurity • Immature development of the premature Infant • Instability of Homeostasis in Premature Infant Instability of body temperature in Infants	• 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				

Physiology (SKL)	M3-Repro-P-0021	Pregnancy Test	• Apparatus identification • Principle • Procedure • Precautions • Recall types of pregnancy test • Performance of student	Sould know Should know Shold know Must know Nice to know Should know	A A A B C A	P3/A3 C1 P3 C1 C1 P3	Skill lab	OSPE
	M3-Repro-P-0023	Examination of 3rd,4th,6th cranial nerves	• Principle • Procedure • Clinical correlation of reflexes • Overview of cranial nerves	Should know Should know Should know Must know	A A A B	C1 P3 C3 C1	Skill lab	OSPE
Biochemistry (LGIS)	M3-Repro-B-012	Female gonadal hormones	• Describe the synthesis, mechanism of action and functions of female sex hormones • Reframe causes related disorders • Categorize related hormonal disorders disorders • Design the curative and preventive healthcare measures. • Read a relevant research article • Use HEC digital library	Must Know	C2 C5 C4 C6 C2 C3	LGIS	MCQs, SAQs SEQs Viva	
	M3-Repro-B-013	Pyrimidine Metabolism	• Describe the synthesis and degradation of pyrimidine nucleotides • Design the curative and preventive healthcare measures for associated disorders. • Apply the use of artificial intelligence in healthcare • Read a relevant research article • Use HEC digital library	Must Know	C2 C6 C3 C2 C3	LGIS	MCQs, SAQs SEQs Viva	
Biochemistry (SGD)	M3-Repro-B-014	Synthesis, mechanism of action and functions of sex hormones	• Describe Synthesis, mechanism of action and functions of male and female gonadal hormones • Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Role play principles of bioethics • Understand the curative and preventive health care measures	Must Know	C2 C3 C2 C6 C2	SGD	MCQs	

Biochemistry (SDL)	M3-Repro-B-015	Clinical role Pyrimidine metabolism	• Explain Pyrimidine metabolism and related disorders	• 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/			
	M3-Repro-B-16	Clinical aspects Female gonadal hormones	• Describe Biochemical basis of Clinical Features • Corelate Causes of hypersecretion & Hyposecretion • Discuss Treatment options	• 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/			
Biochemistry (SKL)	M3-Repro-B-017	Interpretation of female hormonal profile	• Perform tests of female hormonal profile	Must Know	P	Skill Lab	OSPE

Physiology Syllabus of Learning Management System (LMS)

Theory					
Code	**Topics**	**Learning Objectives**	**Calgary Model**	**Mode of Assessment**	**Tool of Assessment**
M3-Repro-P-0024	Physiological anatomy of male reproductive system & spermatogenesis	• Physiological anatomy of male sexual organs • Spermatogenesis and its steps • Hormonal Factors that stimulate spermatogenesis	Nice to know (C)	SDL	MCQs
M3-Repro-P-0025	Physiological anatomy female reproductive system	• Physiological anatomy of female sex organs • Oogenesis and follicular development in the ovaries • Female hormonal system	Nice to know (C)	SDL	MCQs
M3-Repro-P-0026	Semen, capacitation & acrosome reaction	• Semen and its components • Capacitation and its role in Fertilization • Acrosome reaction and Penetration of the Ovum	Must Know (A)	LGIS&SDL	MCQs
M3-Repro-P-0027	Monthly Ovarian Cycle, ovulation	• Monthly Ovarian Cycle • Function of Gonadotropic Hormones • Three phases of Ovarian cycle • (Follicular,Ovulation and luteal phase)	Must Know (A)	LGIS&SDL	MCQs

M3-Repro-P-0028	Male sex hormones, Abnormalities of male sexual function and spermatogenesis	• Testostrone and other male sex hormones • Function of Testosterone • Role of Hypothalamus and anterior pituitary gland	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs
M3-Repro-P-0029	Monthly Endometrial Cycle and Menstruation	• Monthly Endometrial Cycle • Menstruation • Phases of Menstrual cycle • (Proliferative, Secretory and Menstrual phase)	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs
M3-Repro-P-0030	Response of mother's body to pregnancy, Parturition	• Maturation and Fertilization of Ovum • Anatomy and function of placenta • Hormonal Factors in Pregnancy • Parturition • Hormonal and Mechanical factors in Parturition	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs
M3-Repro-P-0031	Female sex hormones (oestrogen and progesterone)	• Functions of Ovarian Hormones • Estradiol and Progesterone • Effects of primary and secondary female sex characteristics	Must Know (A)/ Should know (B)	LGIS&SDL	MCQs

Biochemistry LGIS Syllabus of Learning Management System (LMS)

Theory							
Code	**Topics**	**At the end of lecture students should be able to:**	**Calgary Gauge**	**Learning Domains**	**Teaching Strategy**	**Assessment Tools**	**Learning Resources**
M3-Repro-B-0018	Male gonadal hormones	• Synthesis mechanism of action and functions of male gonadal hormones	Should Know	C2	LGIS	MCQ SEQ VIVA	Lippincott Illustrated reviews of biochemistry 8th edition
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3			
M3-Repro-B-0019	Female gonadal hormones	• Synthesis mechanism of action and functions of female gonadal hormones	Should Know	C2	LGIS	MCQ SEQ VIVA	Lippincott Illustrated reviews of biochemistry 8th edition
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3			
M3-Repro-B-0020	Digestion of nucleic acid and purine synthesis	• Explain digestion of nucleoprotein • Describe purine biosynthesis (Denovosynthesis and salvage pathway)	Should Know	C2 C2	LGIS	MCQ SEQ VIVA	Lippincott Illustrated reviews of biochemistry 8th edition
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3			
M3-Repro-B-0021	Purine catabolism and	• Explain purine catabolism • Discuss related disorders	Should Know Must Know	C2	LGIS	MCQ SEQ VIVA	Lippincott Illustrated reviews of

	related disorders			C3			biochemistry 8th edition
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3			Lippincott Illustrated reviews of biochemistry 8th edition
M3-Repro-B-0022	Pyrimidine metabolism	• Explain Pyrimidine catabolism • Related disorders	Should Know Must Know	C2 C3	LGIS	MCQ SEQ VIVA	Lippincott Illustrated reviews of biochemistry 8th edition
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3			
M3-Repro-B-0023	Regulation of gene expression	• Explain the regulation of gene expression	Should Know	C2	LGIS	MCQ SEQ VIVA	Lippincott Illustrated reviews of biochemistry 8th edition
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3			

Biochemistry SGD Syllabus of Learning Management System (LMS)

Code	Topics	At the end of tutorial students should be able to	Calgary Gauge	Learning Domains	Teaching Strategy	Assessment Tools
M3-Repro-B-0024	Purine metabolism	• Purine denovo synthesis and describe salvage pathway	Should Know	C2	SGD	MCQ SEQ VIVA
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		
M3-Repro-B-0025	Male female sex hormones	• Synthesis, mechanism of action and functions of male female gonadal hormones •	Should Know	C2	SGD	MCQ SEQ VIVA
		• Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Practice principles of bioethics • Understand the curative and preventive health care measures	Nice to know	C3		

Biochemistry SDL Syllabus of Learning Management System (LMS)

Code	Topics Of SDL	Learning Objectives	Learning resources
M3-Repro-B-0026	Applied aspect of Male gonadal hormones	• Biochemical basis of Clinical Fearures • Causes of hyersection & Hyposecretion • Treatment	• 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/
M3-Repro-B-0027	Clinical aspects Female gonadal hormones	• Biochemical basis of Clinical Fearures • Causes of hypersection & Hyposecretion • Treatment	• 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/
M3-Repro-B-0028	Applied aspect of nucleic acid and purine synthesis	• Role of Deficient enzymes • Clinical Features • Investigation	• 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/
M3-Repro-B-0029	Purine catabolism Related disorder	• Explain purine catabolism • Discuss related disorder	• 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/

M3-Repro-B-0030	Clinical role Pyrimidine metabolism	• Explain Pyrimidine catabolism and related disorders	• 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/
M3-Repro-B-0031	Applied aspect of Regulation of gene expression	• Explain the regulation of gene expression • Related clinical disorders	• 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/

Transdisciplinary, Interdisciplinary & Multidisciplinary Case Based Learning (CBL)

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

Vertical Integration LGIS

Pathology

Theory					
Code	Topics	At the end of lecture students of should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
M3-Repro-VI(Path)-001	Sexually transmitted diseases	• Enumerate the STDs • Describe the pathogenesis of syphilis and gonorrhea	C1 C2	LGIS	MCQ's
M3-Repro-VI(Path)-002	BPH/Prostatitis	• Define benign prostatic hyperplasia • Briefly discuss the morphological features of BPH & prostatitis	C1 C2	LGIS	MCQ's
M3-Repro-VI(Path)-003	Polycystic ovaries	• Define the polycystic ovaries Describe the pathophysiology of polycystic ovaries	C1 C2	LGIS	MCQ's

Surgery

Theory					
Code	**Topics**	**At the End of Lecture, Students Should Be Able To:**	**Learning Domains**	**Teaching Strategy**	**Assessment Tools**
M3-Repro-VI(S)-001	Male hypogonadism	• Discuss pathophysiology, signs and symptoms of male hypogonadism • Describe altered hormonal levels in male hypogonadism • Outline treatment plan for hypogonadism	C2 C2 C1	LGIS	MCQ
M3-Repro-VI(S)-002	Undescended Testes & Scrotal Swelling	• Define UDT • Define Retractile Testes • Define Ectopic Testes • Causes of UDT/Ectopic Testes • Differentiate between UDT and Retractile Testes • Differentiate between different scrotal swellings (Hydrocele, Spermatocele, Hemoatocele, Hernia, Tumors) • Management plan	C1 C1 C1 C2 C2 C2 C2	LGIS	MCQ
	Acute Scrotum	• 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					
Code	**Topics**	**At the end of lecture students should be able to:**	**Learning Domains**	**Teaching Strategy**	**Assessment Tool**
M3-Repro-VI(OBG)-001	Menstrual irregularities	• Calssify Menstral cucle abnormalities • Discuss each abnomality • Outline treatment plan for menstrual cycle abnormalities	C1 C2 C1	LGIS	MCQs
M3-Repro-VI(OBG)-002	Puerperium & Lactation	• Understand physiological changes in puerperium • Comprehend the hormonal control of breast development and lactation know the physiology of initiation of lactation • Enlist the differences between human and cows milk composition • Discuss the effect of lactation on menstrual cycle • Enlist advantages of breast feeding	C1 C2 C4 C1	LGIS	MCQs

Medicine

Theory					
Code	**Topics**	**At the end of lecture students should be able to:**	**Learning Domains**	**Teaching Strategy**	**Assessment Tool**
M3-Repro-VI(M)-001	Hermaphroditism	• Define Hermaphroditism (Disorders of Sex Development - DSD) and differentiate between true hermaphroditism and pseudohermaphroditism	C2	LGIS	MCQs
		• Describe the normal sexual differentiation process, including chromosomal, gonadal, and phenotypic sex development.	C2	LGIS	MCQs

Pharmacology

Theory					
Code	**Topics**	**At the end of lecture students should be able to:**	**Learning Domains**	**Teaching Strategy**	**Assessment Tool**
M3-Repro-VI(Pharm)-001	Hormonal Contraceptives	• Classify hormonal contraceptives	C1	LGIS	MCQs
		• Describe their mechanism of action	C2		
		• Describe different clinical uses of hormonal contraceptives	C2		
		• Identify the adverse effects and contraindications of different hormonal contraceptives	C2		

The Islamiyat

Theory					
Code	**Topic**	**Learning Objectives At the end of the lecture the student should be able to**	**Learning Domain**	**Teaching Strategy**	**Assessment Tool**
M3-Repro-SI(ISL)-001	7) Sharing the verses related to the unity of the Ummah and the need for unity	• Identify key Qur'anic verses that emphasize the concept of unity among Muslims (Ummah), such as Surah Al-Hujurat (49:10) and Surah Aal-e-Imran (3:103).	C2	LGIS	MCQs
		• Explain the Islamic perspective on unity, brotherhood, and cooperation, particularly as it relates to interpersonal and professional relationships.	C1	LGIS	MCQs
M3-Repro-SI(ISL)-002	8) Verses related to enjoining what is right and forbidding what is wrong, and the need for enjoining good and forbidding evil along with its principles and methods	• Identify Qur'anic verses and Prophetic traditions (Hadith) that emphasize the duty of enjoining what is right (al-ma'ruf) and forbidding what is wrong (al-munkar), such as Surah Aal-e-Imran (3:104, 3:110) and Surah At-Tawbah (9:71).	C2	LGIS	MCQs
		• Explain the Islamic ethical foundation behind this principle, including its significance in building a morally conscious and responsible society.	C1	LGIS	MCQs
M3-Repro-SI(ISL)-003	9) Qualities of successful people	• Identify key qualities of successful individuals as highlighted in the Qur'an and Sunnah (e.g., Surah Al-Mu'minun 23:1–11), such as honesty, patience, perseverance, sincerity, and humility.	C2	LGIS	MCQs

		• Explain the importance of self-discipline, time management, empathy, and teamwork as essential traits for success in medical education and practice.	C1	LGIS	MCQs

The Pak Studies

Theory					
Code	**Topic**	**Learning Objectives** **At the end of the lecture the student should be able to**	**Learning Domain**	**Teaching Strategy**	**Assessment Tool**
M3-Repro-SI(PKS)-001	6) The Ideology of Pakistan and Quaid-e-Azam	• Define the concept of the Ideology of Pakistan and its roots in Islamic principles such as unity, justice, equality, and moral integrity.	C2	LGIS	MCQs
		• Explain Quaid-e-Azam Muhammad Ali Jinnah's vision for Pakistan, particularly his emphasis on religious freedom, rule of law, and social justice.	C2	LGIS	MCQs
M3-Repro-SI(PKS)-002	8) Islamic democracy	• Define the concept of Islamic democracy and distinguish it from secular democratic systems, highlighting its basis in Shura (consultation), justice, accountability, and equality.	C2	LGIS	MCQs
		• Explain the principles of Islamic governance as derived from the Qur'an and Sunnah, including the role of mutual consultation, rule of law, and collective responsibility.	C1	LGIS	MCQs
M3-Repro-SI(PKS)-003	9) The economic system of Islam	• Define the core principles of the Islamic economic system, including justice, equity, prohibition of interest (riba), and promotion of lawful (halal) earning and spending.	C2	LGIS	MCQs
		• Explain key concepts such as Zakat (obligatory charity), Sadaqah (voluntary charity), trusteeship (amanah), and wealth distribution, and their impact on reducing poverty and promoting social welfare.	C1	LGIS	MCQs

Family Medicine

Theory					
Code	**Topic**	**At The End Of Lecture, Students Should Be Able To:**	**Learning Domain**	**Teaching Strategy**	**Assessment Tools**
M3-Repro-SI(FMed)-001	AIDS	• 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					
Code	**Topic**	**Learning Objectives** **At the end of the lecture the student should be able to**	**Learning Domain**	**Teaching Strategy**	**Assessment Tool**
M3-Repro-SI(BS)-001	Emotion	• 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
M3-Repro-SI(BS)-002	Intelligence	• To define Intelligence. • To handle situations with heightened Intelligence encountered in daily life and clinical practice	C3	LGIS	MCQs

Community Medicne (CHEPI)

Theory & Practical				
Code	**Topic**	**Time Allocated**	**Learning Objectives**	**Learning Domain**
M3-Repro-SI(CHEPI)-001	Introduction to health education and communication 1 hour	1 hour	• Define health communication and understand its types. • Explain role of sender, receiver, feedback and content of health message • Appreciate communication barriers • Explain various functions of health Communication • Understand the scope /contents of health education • Explain different approaches of health education Community awareness programs under the umbrella of CHC (Centre for Health Communication)	C1 C2 C2 C2 C3 C2 C3
M3-Repro-SI(CHEPI)-002	Preventive aspect of STDs 2 hours	1hour theory 1 hour practical	**Theory** • Define STD and its various factors • Discuss the problem statement of STD worldwide. • Enumerate different types of STDs • Discuss all host factors responsible for STDs • Discuss in detail the role of demographic factors in STD spread. • Discuss in detail the role of social factors in STDs • Discuss in detail the role of intervention strategies and planning in control of STDs **Practical** Conduct group activity on following scenarios	C1 C2 C1 C2 C2 C2 C2 P3

			• A young adult visits a clinic with symptoms but fears social stigma. • A couple seeks counseling after one partner tests positive. • A school principal resists implementing STD education; a debate follows. • A public health team designs an intervention for a rural area with limited access.	
M3-Repro-SI(CHEPI)-003	Preventive aspect of AIDS (2hours)	1hour theory 1-hour practical	**Theory** • Discuss in detail the definition of AIDS • Discuss in detail the problem statement of HIV and AIDs • Discuss its impact on the underdeveloped world • Appraise the gravity of the situation. • Discuss the key risk factors in HIV responsible • Explain agent details • Describe the effect of agent stability and its biological determinants • Detailed discussion on the host factors, reservoir of infection and transmission factors responsible • Discuss in detail the symptomology, treatment and prevention of AIDS and HIV **Practical** Conduct group activity on following scenarios • Alleviate fear, stigma, and denial in Newly diagnosed HIV-positive patient • A rural village meeting addresses rising HIV cases and poor healthcare access.	C2 C2 C2 C3 C2 C1 C2 C2 C2 P3

			• Teens reflect on risky behaviors after one tests positive for HIV. • A scientist explains how the HIV virus infects and survives in the body. • A health team debates how to prevent HIV through education and outreach. • Role of social worker for A woman in poverty struggles to get HIV treatment amid systemic barriers.	
M3-Repro-SI(CHEPI)-004	Personal hygiene (hand, eye, oral) 2 hours	1 hour theory 1 hour practical	**Theory** • Define personal hygiene • Explain importance of personal hygiene in preventing illness. • Identify common hygiene practices that contribute to personal well-being. • Explain the importance of proper handwashing . • Describe the correct technique for washing hands • Identify key times when handwashing is necessary • List the steps involved in effective toothbrushing and flossing routines. • Explain the role of diet and regular dental check-ups in maintaining oral health • Explain the importance of eye hygiene • Describe common practices for maintaining eye hygiene. • Demonstrate proper techniques for cleaning around the eyes **Practical** Conduct group activities on • Importance of personal hygiene • Importance of hand washing • Importance of oral hygiene • Importance of eye hygiene	C1 C2 C2 C2 C3 C2 C2 C2 C2 C2 C2 P3

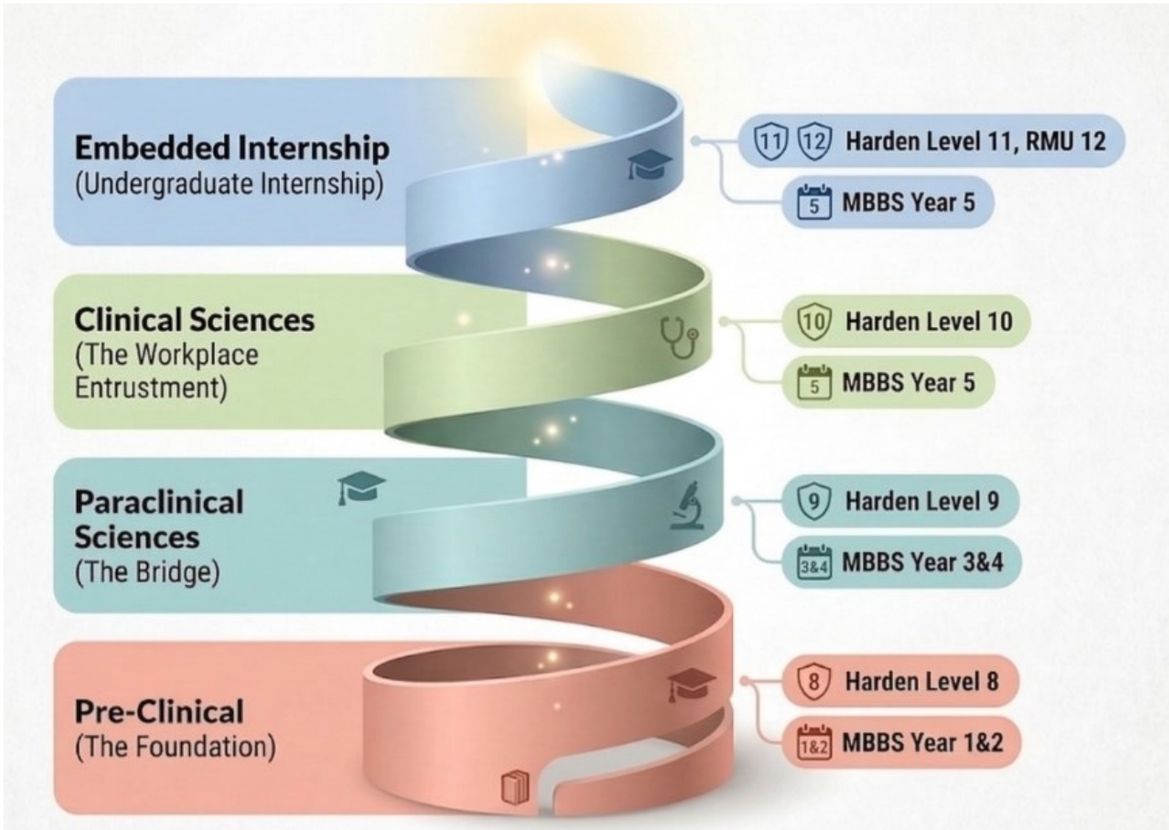
M3-Repro-SI(CHEPI)-005	Importance of vaccination 1 hour	1 hour	**Practical** Conduct group activities on • Addressing common myths associated with polio vaccine • Develop a plan for increasing COVID-19 booster uptake among health staff • Addressing vaccine hesitancy for measles vaccine • Addressing issue of Migrant Population and Missed Vaccinations • Address Religious Resistance to Vaccination • Resolve the issue of Adverse Events following immunization	P3
M3-Repro-SI(CHEPI)-006	Prevention of dengue 2hours	1-hour theory 1-hour practical	**Theory** • Define dengue fever and explain its etiological agent • Describe the epidemiology of dengue • Explain the transmission cycle of dengue • List the clinical features of dengue • Identify diagnostic tests used for dengue • Describe the management of dengue • Explain the principles of dengue prevention and control **Practical** Conduct group activities on: • Diagnosing dengue fever • Implementing preventive and control measures for dengue • Design School-Based Dengue Awareness Campaign	C1 C2 C2 C1 C2 C2 C2 P3

➢ Central Nerves System Module-I

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



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

Module Task Force Team		
1.	Coordinator	Dr. Arsalan Manzoor Mughal (Associate Professor of Anatomy)
2.	DME Focal Person	Dr. Farzana Fatima
3.	Co-coordinator	Dr. Gaiti Aara ((APWMO of Anatomy)
4.	Co-Coordinator	Dr. Rahat (Senior Demonstrator of Biochemistry)
5.	Co-coordinator	Dr. Shazia (Senior Demonstrator of Physiology)

DME Implementation Team		
1.	Director DME	Prof. Dr. Ifra Saeed
2.	Assistant Director DME	Dr Farzana Fatima
3.	DME Implementation Team	Prof. Dr. Ifra Saeed Dr. Farzana Fatima Dr. Saira Aijaz
4.	Editor	Muhammad Arslan Aslam

Themes				
Subjects	**Embryology**	**Histology**	**General Anatomy**	**Gross Anatomy**
• Anatomy	• Early CNS Development • Spinal Cord • Hindbrain & Cerebellum • Midbrain • Forebrain • Peripheral Nervous System	• Ganglia • Peripheral Nerves • Spinal Cord • Cerebellum • Cerebrum	• General Anatomy of Nervous System • General Anatomy of Autonomic Nervous System.	• 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
• Biochemistry	• Fatty acid metabolism • Cholesterol Metabolism • Ketone bodies metabolism • Lipoproteins and Phospholipids • Fatty Liver and hyper Lipidemias. • Glycerophospholipid & Sphimgo phospholipid			
• Physiology	• 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 • 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	
• The Holy Quran Translation	• Imaniyaat-5 • Imaniyaat-6 • Momalat-I • Momalat-II
• Pak Studies / Islammiyat	• Musawat • Tehreek-e-Pakistan (1940-1947) • Khwateen k hakook • Qayam e Pakistan, Ibtidai Mushkilaat
• Bioethics & Professionalism	• 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
• Radiology & Artificial Intelligence	• Skull radiograph • CT Scan & MRI
• Family Medicine	• Approach to a patient with headache
• Behavioral Sciences	• Emotions • Memory
Vertical Integration	
• Pharmacology	• Introduction to CNS
• Pathology	• Patterns of injury in nervous system • Meningitis
• Pediatrics	• Meningitis • Cerebral palsy, Polio

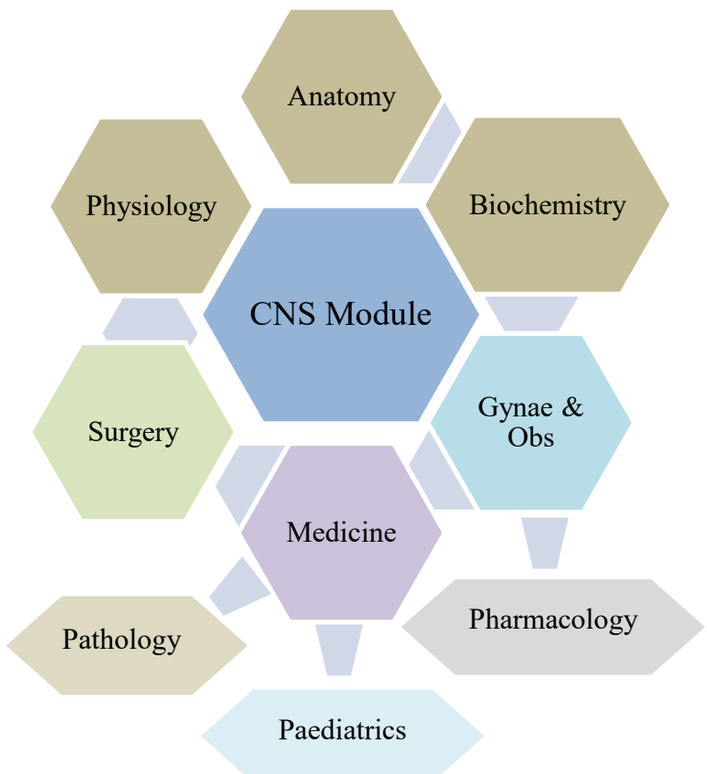
• Surgery	• Spinal injury and head injury • Management of hydrocephalus • Brain abscess • Polytrauma patient
• Medicine	• Spinal cord and peripheral nervous system • Encephalitis • Cerebellar disorders • Epilepsy and other convulsive disorders • Stroke
• Gynecology & Obs	• Seizures during pregnancy (eclampsia/ epilepsy)
Early Clinical Exposure (ECE)	
• Medicine	• Cases of stroke • Paraplegia • Vegetative state
• Surgery/ Neurosurgery	• Head injury. • Nerve injuries
• Radiology	• CT scan • Brain • Normal • Stroke • Hemorrhage • Infarction Hydrocephalus • Brain atrophy • Brain Edema • Skull/ spine Fractures • MRI Brain/ Spine
Clinical Themes	
• 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

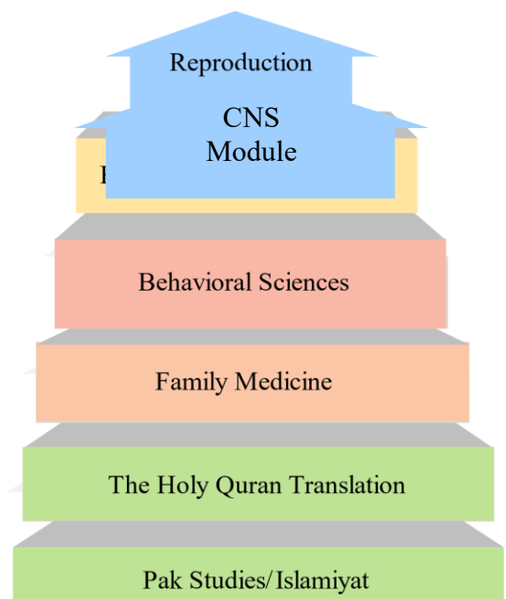
Implementation of Terms of Reference (TORS)

- 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 actin 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!

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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		

	• 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 Spinal Cord and Cerebellum	• Describe the histological structure of spinal cord	C2	LGIS	MCQs SAQs SEQs VIVA
	• Describe the histological structure of cerebellum	C2		
	• Discuss cells in each layer along with its histological morphology	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 Mesencephalon and Prosencephalon	• Describe the development of mesencephalon	C2	LGIS	MCQs SAQs SEQs VIVA
	• Describe the arrangement of neuroblasts in mesencephalon	C2		
	• Describe the development of mesencephalon	C2		
	• Describe the arrangement of neuroblasts in mesencephalon	C2		
	• Describe the development of pituitary gland	C2		
	• Discuss the anatomical basis of pharyngeal hypophysis and craniopharyngiomas	C3		
	• Discuss the anatomical basis of birth defects such as encephalocele, microencephaly, microcephaly, Chiari malformation.	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 Cerebrum	• Describe the histological structure of cerebrum	C2	LGIS	MCQs SAQs SEQs 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		
	• Describe the development cranial nerves	C2		
	• 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 viscero cranium 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	• Identify and describe meninges and their reflections on specimens and models	C2	Skills lab	• MCQs • SAQs • SEQ • OSPE VIVA
	• Describe the attachments and relations of dural venous sinuses of brain with the help of models and specimens	C2		
	• Discuss the clinical importance of facial vein connection with dural venous sinuses.	C3		
	• Differentiate between various types of intracranial hemorrhages	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		
	• Differentiate between different types of headaches	C3		
Spinal cord	• Describe the internal and external structure of spinal cord	C2	Skills lab	• MCQs • SAQs • SEQ • OSPE VIVA
	• Compare the arrangement of white and gray matter in different regions of the spinal cord	C2		
	• Enumerate the major ascending and descending tracts of spinal cords	C1		
	• Illustrate the arrangements of ascending and descending tracts in the spinal cors	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		
Ascending tracts and their clinicals	• List the ascending tracts of the spinal cord	C1	Skills lab	• MCQs • SAQs • SEQ • OSPE VIVA
	• Tabulate the sensation, receptor, first to third order neurons, pathways and destinations	C2		
	• Describe and illustrate the pathways of lateral spinothalamic tract, anterior spinothalamic tract, anterior spinocelebellar tract and posterior spinocerebellar tracts	C2		
	• Describe and illustrate the pathways of spinotectal tract, spinoreticular tract and spino-olivary tracts	C2		
	• 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	• 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	• 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	• 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	• 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	• 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	• 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	• 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 3rd Ventricle	• Enlist nuclei of thalamus, epithalamus & subthalamus and describe their functions	C1	Skills lab	• 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	• 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		

	• Discuss the anatomical basis of lesions of internal capsule and alzheimer's disease	C3		• OSPE • VIVA
	• 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		
	• Discuss the anatomical basis of schizophrenia and frontal lobectomy	C3		
	• Discuss the basis cerebral dominance, consciousness, persistent vegetative state, sleep and epilepsy.	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		
Lateral Ventricle &CSF	• Describe the relations and boundaries of lateral ventricle	C2	Skills lab	• MCQs • SAQs • SEQ • OSPE • VIVA
	• Describe the formation of choroid plexus in ventricles	C2		
	• Explain the function, production, circulation, and absorption of cerebrospinal fluid	C2		
	• Explain the causes of overproduction and blockage of CSF	C2		
	• Discuss the anatomical basis of various types of hydrocephalus and papilledema.	C3		
	• Discuss the formation and clinical significance of blood brain barrier, blood CSF barrier and CSF Brain interface.	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 I,II,II,IV,VI	• Identify the nuclei and connections of CN I,II,II,IV,VI	C2	Skills lab	• MCQs • SAQs • SEQ • OSPE
	• Trace the pathway and perform reflexes associated with of CN I,II,II,IV,VI	C2		
	• Describe the anatomical basis of lesions of visual pathway and ophthalmoplegias	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		• VIVA
	• Read relevant research article.	C3		
Cranial nerves V,VII	• Identify the nuclei and connections of CN V,VII	C2	Skills lab	• 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	• 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	• 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	• 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	• 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 o Normal radiographs o MRI o CT scan	C2	Skills lab	• 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 • Identify different structures of female pelvis at different levels; S5, coccyx, Symphysis pubis, ischial tuberosity, anal verge	C2 C2 C3	Skill Lab	• MCQs • SAQs

	• Practice the principles of bioethics. • Apply strategic use of A.I in health care • Read a relevant research article •	C3 C3 C3		• SEQ • OSPE • VIVA

Topics	Learning objectives	Learning Resources
Anterior And middle Cranial Fossa	• 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	• 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	• 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	• 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	• 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	• 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	• 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 spinocelebellar tract and posterior spinocerebellar tracts • Describe and illustrate the pathways of spinotectal tract, spinoreticular tract and spino-olivary tracts	• 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

	• Describe the anatomical basis of the signs and symptoms in lesions of the ascending tracts	
Medulla Oblongata, Pons& Cerebellum	• 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	• Snell's Clinical Neuroanatomy 8th Edition, pg no. 185-247 • https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9z https://link.springer.com/chapter/10.1007/978-1-61779-779-8_13
Midbrain and Diencephalon	• 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.	• Snell's Clinical Neuroanatomy 8th Edition, pg no. 209, 363-372 • https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9z https://link.springer.com/chapter/10.1007/978-3-319-60187-8_8
Cerebrum & Ventricular system	• 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	• Snell's Clinical Neuroanatomy 8th Edition, pg no. 249-277, 436-462 • https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9z • https://link.springer.com/article/10.1007/BF00344224 • https://www.tandfonline.com/doi/full/10.1080/10255840701492118
Canial Nerves 1-7	• 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	• Snell's Clinical Neuroanatomy 8th Edition, pg no. 323-361 • https://www.youtube.com/watch?v=auogbJFitmI&pp=ygUSY25zIGFuYXRvbXkgdmlkZW9z • https://link.springer.com/referenceworkentry/10.1007/978-3-540-29678-2_1315

Cranial Nerves 8-12, Basal Ganglia, Limbic system and Reticular Formation	• 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	• 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

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		

	• 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		
Spinal cord	• Identify histological slide of spinal cord	P	Skills lab	OSPE VIVA
	• Illustrate histological picture of spinal cord	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		
Cerebellum	• Identify the microscopic features of cerebellum	P	Skills lab	OSPE VIVA
	• Illustrate histological picture of cerebellum	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		

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				
	• Enumerate the important neurotransmitters of nervous system	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				

	• Describe transmission of thermal signals in nervous system	C1				
Sensory pathways for transmitting somatic signals	• Classify somatic senses	C2	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 the sensory pathways for transmission of somatic sensations to central nervous system	C1				
	• Enumerate sensations carried by dorsal column system and anterolateral system	C1				
	• Describe the characteristics of transmission in the dorsal column medial lemniscal system and anterolateral system	C1				
	• Compare and contrast dorsal column medial lemniscal system and anterolateral system	C2				
Introduction to autonomic nervous system Basic Characteristics of sympathetic & parasympathetic function	• Describe general organization of autonomic nervous system	C1	LGIS	MCQ SEQ VIVA	• 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) 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 https://youtu.be/7pGKa-1tSJw https://youtu.be/gBOAYgMxq-Q
	• Describe transmission of thermal signals in nervous system	C1				
	• 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				
	• Explain cortical mapping & association cortex	C2			• 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/ascending-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	• 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
	• 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	• 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
	• 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: o Vegetative function o Endocrine function Behavioral function o 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	• Explain mechanism of short term, intermediate and long-term memory	C2	LGIS	SEQ VIVA	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://www.sciencedirect.com/topics/psychology/learning-and-memory
	• Describe mechanism of consolidation of memory	C1				
	• Enumerate specific parts of brain involved in memory	C2				
	• Explain the role of each part	C2				
Reticular activating system and sleep	• Describe activating driving system of the brain	C1	LGIS	MCQ SEQ VIVA	• 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
	• Explain the reticular activating system	C2				
	• Discuss the control of cerebral activity by signals from brain stem	C2				
	• Explain neurohormonal system of the brain	C2				
	• Define sleep and enumerate types of sleep	C1				
	• Compare and contrast between two types of sleep	C2				
	• Describe the basic theories of sleep in detail	C1				
	• Explain physiological effects of sleep	C2				
	• Describe sleep and wakefulness cycle	C1				
	• Describe brain waves	C1			• Ganong's Review of Medical Physiology.25TH Edition. Section 02 (Chapter 14, Page	https://www.webmd.com/epilepsy/guide/types-epilepsy
	• Enumerate different types of brain wave	C2				
	• 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/T7MKlPYiL48
	• 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 MedicalPhysiology.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/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		
	• Briefly explain physiological actions of ANS, vasomotor tone, vagal tone & sympathetic stress response	C2	LGIS	MCQ SEQ VIVA
	• 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. • 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 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 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 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		

	treatment			
	• Explain Huntington‘s Chorea regarding its causes, signs and symptoms	C2		
Limbic system Functions of hypothalamus	• 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: o Vegetative function o Endocrine function Behavioral function • Reward and punishment function	C2		

Topics	Learning objectives	Learning Resources
Pathways for transmitting somatic signals	• 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	• 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	• Explain cortical mapping & association cortex • Describe lesions of somatosensory areas • Summarize role of thalamus in somatic sensations • Interpret the importance of dermatomes	• 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/ascending-tracts-sensory/
	• 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	• 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		• 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	• 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	• 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	• 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	• 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	• Describe the concept of limbic system	• Textbook of Medical Physiology by Guyton & Hall.14th Edition • https://youtu.be/h3K9RfGw8sI • https://www.endocrineweb.com/endocrinology/overview-hypothalamus
Learning and memory	• 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	• 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	• 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	• 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	• 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	• 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
	• Describe brain waves • Enumerate different types of brain wave • Explain the origin of different brain waves • Describe EEG • Define epilepsy	• 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	• 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	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/T7MKlPYiL48
Reticular activating system and sleep	• 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	• 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	• 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	• 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_organs https://youtu.be/CzeAcc39Cyo

Motor cortex & physiological importance of neocortex, Corticospinal or pyramidal tract, Extra pyramidal system	• 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	• 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/B88BNYWVkWE
Basal Ganglia & Lesions	• 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	• 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			

	• Clinical Correlation	C3			
Recording of body temperature	• Apparatus identification	C1	Skill lab	OSPE	Practical Notebook of Physiology Second year MBBS by Dr Saqib Sohail
	• Principle	C1			
	• Procedure	A,P			
	• Precautions	P			
	• Record oral, axillary & rectal temperature	C1			
	• Recall abnormalities of body temperature	C1			
Examination of superficial & deep reflexes	• 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 reflex arc	C1			
	• Recall effects of UMNL & LMNL on reflexes	C1			
Examination of 3rd, 4th & 6th cranial nerves	• 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 & pathways of various cranial nerves	C1			
	• Recall effects of lesions of cranial nerves	C1			
Examination of 5th, & 7th cranial nerves / Examination of 8th , 9th, 10, 11th, 12th cranial nerves	• 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 SAQs Viva
	• Explain entry of fatty acid into mitochondria (carnitine shuttle)	C2		
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	• Describe the steps of biosynthesis of Glycerophospholipids with its regulation and clinical significance	C2	LGIS	MCQs SAQs Viva
Metabolism of Sphingophospholipids	• Explain the steps of biosynthesis of sphingophospholipids with its regulation and clinical significance	C2	LGIS	MCQs SAQs Viva
Introduction to Lipoproteins	• Discuss the functions and roll of Lipoproteins & apolipoprotein	C2	LGIS	MCQs SAQs Viva

LDL& HDL	• Explain the composition, functions and clinical significance of LDL& HDL	C2	LGIS	MCQs SAQs Viva
	• Illustrate the mechanism of reverse cholesterol transport	C3		
Disorders of lipoprotein metabolism	• Classify and explain the disorders of lipoprotein metabolism. • (hyper & hypo lipoproteinemia)	C2	LGIS	MCQs SAQs Viva
Fatty Liver & Adipose Tissue	• Interpret conditions leading to Fatty liver	C3	LGIS	MCQs SAQs Viva
	• Describe metabolism of adipose tissue & Brown fat	C2		
Disorders of lipoprotein metabolism	• Classify and explain the disorders of lipoprotein metabolism. • (hyper & hypo lipoproteinemia)	C2	LGIS	MCQs SAQs Viva

Topics	Learning objectives	Learning Resources
Chylomicron metabolism	• Describe synthesis of chylomicron, its breakdown and factors affecting it	• Lippincott Biochemistry Chapter. 18 page 253 https://www.ncbi.nlm.nih.gov/books/NBK305896/
HDL & LDL metabolism	• Explain composition functions and clinical significance of LDL & HDL • Illustrate mechanism of revise cholesterol synthesis	• Lippincott Biochemistry Chapter. 18 page 253 • https://www.alilamedicalmedia.com/-/g...

Fatty acid oxidation	• Describe steps enzymes energy calculation of Beta oxidation of saturated fatty acid	• Lippincott Biochemistry Chapter. 16 page 213 • https://ninjanerd.org
Synthesis &Interconversion of Ketone Bodies, Regulation of Ketogenesis, Ketolysis	• Explain synthesis and breakdown of ketone bodies and related disorders	• Lippincott Biochemistry Chapter. 27 page 411 • https://youtu.be/GuSqOsm3QV8
Synthesis of Cholesterol and its regulation	• Describe steps regulation and related disorders of cholesterol synthesis	• Lippincott Biochemistry Chapter. 18 page 244 • https://youtu.be/y9zsDFdMvZY

	• Principle	C1		
	• Procedure	A,P		
	• Precautions	P		
	• Recall functions & pathways of various cranial nerves	C1		
	• 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	• List the major neurotransmitters in the CNS	C1	LGIS	MCQ
	• List the major classes of receptors for each of the primary neurotransmitters and their associated relevant disorders	C1		
	• Identify the special considerations associated with CNS drug delivery	C1		
	• 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	• 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	• 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	• 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	• Define and discuss pathophysiology and discuss symptoms and signs	C1	LGIS	MCQs
	• Discuss the causes	C2		
	• Describe the management	C2		
Epilepsy and other convulsive disorders	• Define and discuss pathophysiology	C1	LGIS	MCQs
	• Discuss the causes	C2		

	• Describe the management	C2		
Encephalitis	• Define and discuss and discuss pathophysiology, symptoms and signs	C1	LGIS	MCQs
	• Discuss the causes	C2		
	• 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	• Classify Brain Tumors	C1	LGIS	MCQ
	• Outline clinical features of brain tumors. • Approach towards a SOL brain	C1		
Brain abscess	• Define Brain Abscess	C1	LGIS	MCQ
	• Outline clinical features of brain abscess	C1		
Head injury	• Define head injury	C1	LGIS	MCQ
	• Mechanism of Head injury	C1		
	• Clinical features of head injury	C1		
	• Glassgow coma Scale	C1		
Poly trauma Patient	• Define polytrauma	C1	LGIS	MCQ
	• Describe triage	C1		
	• 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/epilepsy)	• Enumerate common neurological disorders during pregnancy (eclampsia, epilepsy)	C1	LGIS	MCQs
	• Understand neurological changes leading to eclampsia and epilepsy	C1		
	• Understand the effects of epilepsy and anti-epileptic drugs on mother and fetus	C1		
	• 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
	• Define meningitis.	C1		
	• Discuss Epidemiology &Pathophysiology	C1		
	• Discuss Etiological organisms at different ages	C1		
	• Discuss Clinical features	C1		
	• Discuss Diagnosis & Management	C1		
	• Discuss Complications & prognosis	C1		
	• Discuss Prevention of meningitis	C1		
	• Scenario of a Cerebral Palsy patient			
	• Student will be able to know			
	• Discus Brief anatomy of brain	C2		

Cerebral Palsy	• Definition of cerebral palsy	C1	LGIS	MCQs
	• Discuss Epidemiology	C2		
	• Discuss Etiology	C2		
	• Discuss Pathophysiology	C2		
	• Discuss Clinical presentation & anatomic classification of Cerebral Palsy	C2		
	• Discuss Associated problems	C2		
	• Discuss Management & Prevention	C2		
Polio	• Scenario of a patient with acute flaccid paralysis	C1	LGIS	MCQs
	• Student will be able to know	C1		
	• AFP definition	C1		
	• Discuss Etiology & Epidemiology of Polio	C2		
	• Discuss Pathogenesis	C2		
	• Discuss Clinical features	C2		
	• Discuss Management	C2		
	• Discuss Complications & sequel	C2		
	• 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	• Interprat Normal Skull Radioghraph	C1	LGIS	MCQs
	• Discuss fractures and other diseases with their clinical significance	C2		
CT- scan brain	• Interpret normal anatomical structures	C2	LGIS	MCQs
MRI & CT Scan	• List some indications for contrast enhanced MRI and CT	C1	LGIS	MCQs
CT scan	• 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	• 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	• Discuss in detail the clinical features and management	C2	LGIS	MCQs
Strabismus	• 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	1st Week	Introduction to CNS pharmacology	Dr. Omaima Asif (Even)
					Dr Arsheen (Odd)
02-08-2024 Friday	Pediatrics (LGIS)	08:00AM – 09:00 AM	1st Week	Meningitis	Dr. Mamoona Qudrat (Even)
					Dr. Tanzeela Rani (Odd)
03-08-2024 Saturday	Pathology (LGIS)	10:30AM – 11:20 AM	1st 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	2nd Week	Patterns of injury in nervous system	Dr. Nida Fatima (Even)

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

Behavioral Sciences				
Theory				
Topic	**At The End Of Lecture Students Should Be Able To**	**Learning Domain**	**Teaching Strategy**	**Assessment Tool**
Emotions	• To be able to define emotions.	C1	LGIS	MCQs
	• To understand the neuroanatomy and neurochemistry of emotion way to deal with emotion	C2		
Memory	• To be able to outline the types of memory.	C2	LGIS	MCQs
	• 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	• 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	• 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	• 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	• Assignment based assessment involving real life case scenarios under aggregate Marks

	challenging situations • 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) • Assignment to be uploaded on LMS
Ethical dilemmas practice involving breach in principle of justice	• 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	• Assignment based assessment involving real life case scenarios under aggregate Marks (Internal Assessment) • 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	• Describe presenting complains of patients with Headache • Discuss complications of Headache • Describe initial treatment of patients with Headache • Know when to refer patient to consultant/ Hospital	C3	LGIS-1	MCQs

Early Clinical Exposure (ECE)		
Rotation to Department of Medicine		
Session	**Learning Objectives**	**Teaching Strategy**
I Cases of stroke	At the end of the session students will be able to • 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	• Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit
II Paraplegia	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
III Vegetative state	• 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.	• 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	At the end of the session students will be able to • 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.	• Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit
II Nerve injuries	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
	• 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.	• Bedside teaching • Duration 1 hrs

	• 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.	• Conducted by senior faculty member of unit

Rotation to Department of Radiology		
Session	**Learning Objectives**	**Teaching Strategy**
I CT scan Brain • Normal • Stroke • Hemorrhage • Infarction	At the end of the session students will be able to • 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.	• Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit
II Hydrocephalus	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit

	• Describe the treatment options available, including surgical interventions like ventriculoperitoneal shunt placement and endoscopic third ventriculostomy.	
III Brain atrophy	• 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.	• Bedside teaching • Duration 1 hrs • Conducted by senior faculty member of unit
IV Brain Edema	• 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.	• Bedside teaching • Duration 1 hrs • Conducted by senior faculty member of unit
	• 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	• 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.	• Bedside teaching • Duration 1 hrs • Conducted by senior faculty member of unit
VI MRI Brain/ Spine	• 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.	• Bedside teaching • Duration 1 hrs Conducted 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	1st Week	Imaniyaat-5	Mufti Naeem Sherazi (Odd)
02-08-2024 Friday	Quran Translation	11:00AM – 12:00 PM	1st Week	Imaniyaat-6	Mufti Naeem Sherazi (Even)
09-08-2024 Friday	Quran Translation	10:00AM – 11:00 AM	2nd 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	2nd 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	3rd 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	3rd 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	5th Week	Approach to a patient with neuronal disease	Dr. Sadia
27-08-2024 Tuesday	Behavioral Sciences (LGIS)	11:20AM – 12:10 PM	5th Week	Memory & Emotions	Dr. M. Azeem Rao (Even)
					Dr. Zarnain Umar (Odd)
29-08-2024 Thursday	Behavioral Sciences (LGIS)	11:20AM – 12:10 PM	5th Week	Metacognition	Dr. Zarnain Umar (Even)
					Dr. Ali Tasaddaq (Odd)
30-08-2024 Friday	Quran Translation IV	08:00AM – 09:00 AM	5th Week	Momalat-I	Mufti Naeem Sherazi (Odd)
	Quran Translation V	09:00AM – 10:00 AM		Momalat-II	Mufti Naeem Sherazi (Even)

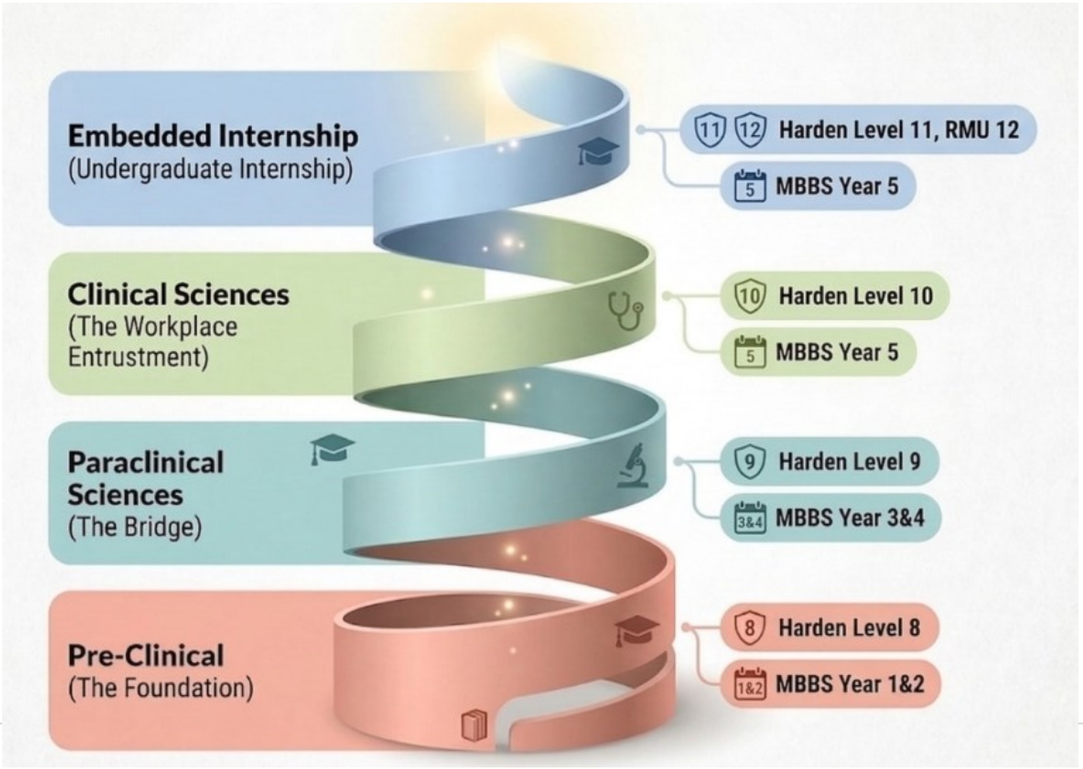
SECTION – VII

- **Block-VI**
  - **Special Senses Module**
  - **Endocrinology Module-I**

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

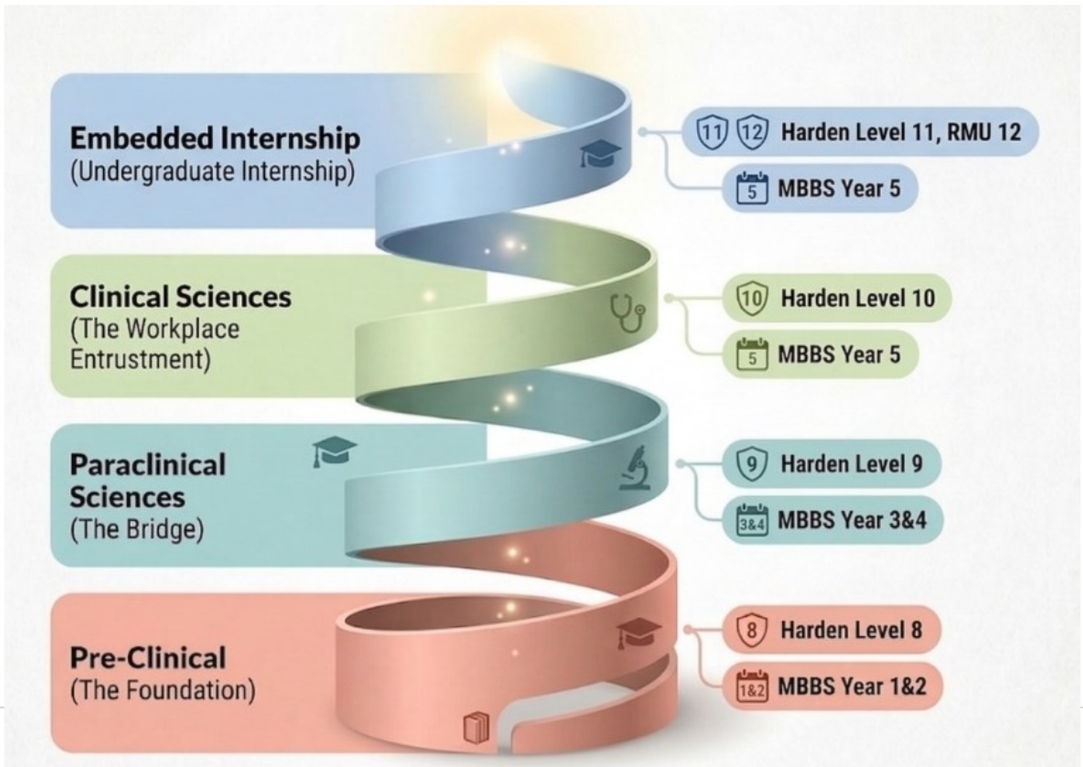


➢ Special Senses Module

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



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

Module Task Force Team		
1.	Coordinator	Dr. Minahil Haq (Senior Demonstrator of Anatomy)
2.	DME Focal Person	Dr. Farzana Fatima
3.	Co-coordinator	Dr. Sadia Baqir (Senior Demonstrator of Anatomy)
4.	Co-Coordinator	Dr. Romessa (Demonstrator of Biochemistry)
5.	Co-coordinator	Dr. Fareed Ullah Khan (Senior Demonstrator of Physiology)

DME Implementation Team		
1.	Director DME	Prof. Dr. Ifra Saeed
2.	Assistant Director DME	Dr Farzana Fatima
3.	DME Implementation Team	Prof. Dr. Ifra Saeed Dr. Farzana Fatima Dr. Saira Aijaz
4.	Editor	Muhammad Arslan Aslam

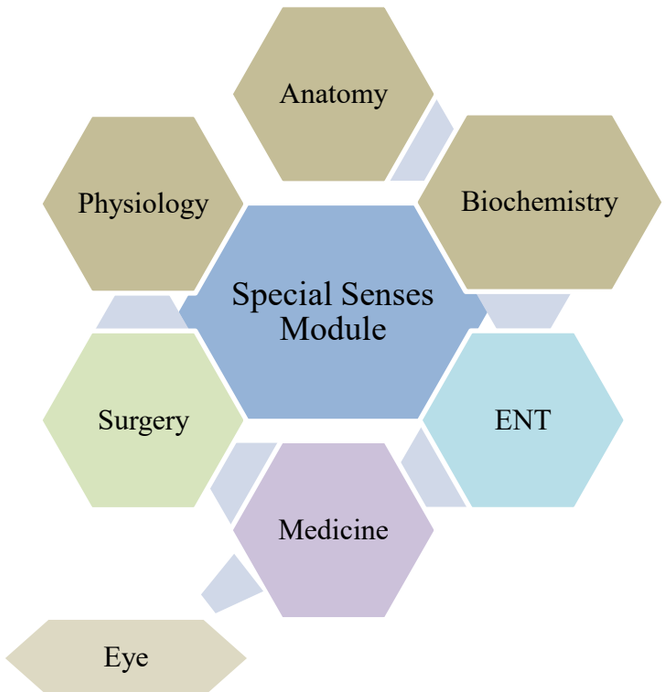
Themes							
Block	**Subjects**	**Embryology**	**Histology**	**Histology Practical SKL. Lab.**	**Gross Anatomy**	**CBL**	**SDL**
\ III	• Anatomy	• Development of Eye • Development of Pharyngeal arches • Development of Ear	• Histology of Eye • Histology of Ear	• Cornea • Retina • External and Internal ear	• 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) • Mandible • Temporomandibular joint • Face • Scalp • Orbit boundaries and Extraocular muscles • Vessels and nerves of orbit • Eyeball • Eyelid and lacrimal apparatus • Parotid and temporal region • Infratemporal fossa • Pterygopalatine fossa • External and middle ear • Inner ear • Nose and paranasal sinuses	• Oculomotor nerve palsy • Extra Dural hemorrhage	• Norma frontalis, verticalis and basalis • Lateralis and occipitalis, TMJ & Mandible Orbit boundaries • Extraocular muscles • Vessels and Nerves of orbit • Temporal and Infra temporal region, Pterygopalatine fossa • External and middle ear
	• Physiology	• Physiology of Ear & Eye					
	• Biochemistry	• Receptors, Second messengers, Neurotransmitters, Vitamin A role in vision					
	Spiral Courses						
	• The Holy Quran Translation	•					
	• Islamiayat	• Imaniat (Hadith) • Zimidaari aur taluqaat • Uswa-e-hasna					

	• Pak Studies	• Pakistan ki jughrafiyai ahmiyat aur difai haisiyat • Pakistan k hamsaya mumalik se taluqaat • Pakistan k qudrati wasail-maadniyaat
	• Biomedical Ethics / Professinalism	• Ethical dilemmas Involving breach in Justice
	• Behavioral Sciences	• Perception
	• Radiology & Artificial Intelligence	• General radiologic concepts
	• Family Medicine	• Approach to a patient with earache
	Vertical Integration	
	• Surgery	• Plastic surgery
	• ENT	• Nasal polyp & Sinusitis & Diseases of External Nose • Otitis Media Ear Discharge &Hearing Problems in Children • Facial fractures
	• Medicine	• Management Of Covid-19 Sense of Smell
	• Eye	• Refractive Errors Strabismus • Ocular trauma & Ocular Procedures • Conjunctivitis Chalazion • Cataract & Glaucoma & Anti glaucoma drugs
	Early Clinical Exposure (ECE)	
	• Medicine	• 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 of Cataracts and Management Options • Glaucoma: Types, Mechanisms, and Treatment	

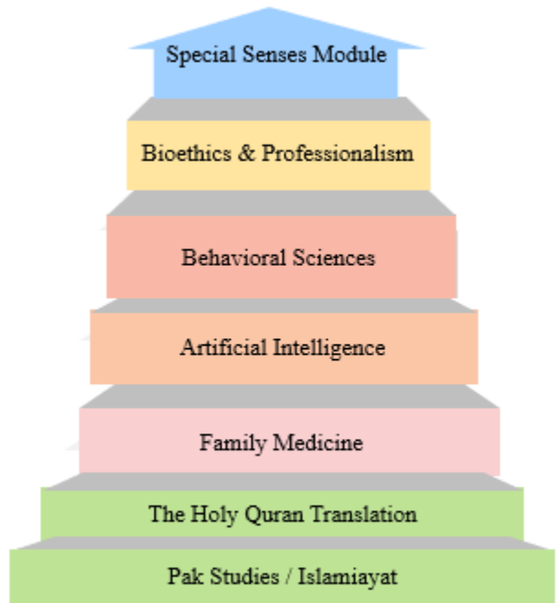
	● Otitis Media and Externa: Causes and Management ● Hearing Loss: Types and Clinical Evaluation ● Pathophysiology of Rhinitis and Sinusitis ● Diagnosis and Management of Nasopharyngeal Carcinoma ● Vertigo: Peripheral vs. Central Causes ● Retinal Detachment: Diagnosis and Surgical Management ● Disorders of Taste and Smell: Causes and Clinical Features ● Basics of Audiometry in Hearing Assessment

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 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 ones 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 phayngitis, 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.
- Demostrate awareness of ethical, legal and social implecation of issues related to bioethics.

Attitude

- Demonstrate effective communication skill strategies while interacting with patients.
- Demonstrate teamwork and positive interaction with colleges.
- Demonstrate self learning attitude and problem-solving skills.

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	• 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 derivates 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	• 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

	• 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 C2 C3 C3		
Development of palate	• 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	• 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)	• 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)	• 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 C3	LGIS	MCQ SAQ VIVA OSPE

Development of Ear	• 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 commom 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	• 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 fuction of sensory hair cells. • Describe the appearance and function of spinal ganglia.	C2 C2 C2 C2 C2	LGIS	MCQ SAQ VIVA

	• 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 C3		OSPE
Histology of Eye I (Fibrous & Vascular coat)	• 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 C3	LGIS	MCQ SAQ VIVA OSPE
	• Describe layers of retina • Discuss retinal pigment epithelium	C2 C2		

Histology of Eye II (Retina & Photoreceptors)	• Discuss histology& functions of neuronal retina. • Describe photoreceptors & rod cells. • Understand the bio-physiological aspects of Palate. • Correlate with the clinical conditions like retinal detachment • 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 C3 C2 C3 C3 C3	LGIS	MCQ SAQ VIVA OSPE

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.)	• Define boundaries of Norma frontalis and verticalis.	C1	Skills Lab	MCQ SAQ VIVA OSPE
	• Enumerate their muscle attachment.	C1		
	• Describe and features of its structure	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 Surface of Cranial Base (Norma Basalis)	• Describe bones forming the base of skull	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Explain the details of anterior, middle and posterior part of base of skull	C2		
	• Identify different foramina and structures passing through them.	C1		
	• Explain the attachments and relations of base of skull.	C2		
	• Fracture of cranial base	C2		
	• Head injuries and intracranial hemorrhage	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		
Lateral & Occipital Aspect of Cranium (Norma Lateralis. & Occipitalis)	• Enlist various bones in normal lateralis. Describe the cranial and facial subdivision. Define external acoustic meatus,	C1	Skills Lab	MCQ SAQ VIVA OSPE
	• Discuss attachments of mastoid and styloid process.	C2		
	• Explain the boundaries of Norma occipitalis.	C2		
	• Identify different foramina and structures passing through them at the base.	C1		
	• Explain its attachments and relations.	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		
Mandible	• Describe the anatomical features of mandible	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Describe parts of mandible	C2		
	• Explain structural features of each part	C2		
	• Enlist attachments of each part	C1		
	• Describe blood and nerve supply of mandible.	C2		
	• Interpret applied anatomy of mandible.	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		
Temporomandibular joint (TMJ)	• Discuss the temporomandibular joint, its type, formation and neurovascular supply.	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Describe the movement's axis and muscles involved.	C2		
	• Correlate clinically disorders of the temporo- mandibular joint.	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		
Face	• Discuss limits of face.	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Tabulate the muscles of face. (Superficial and deep) origin, insertion, nerve supply and action.	C2		
	• Discuss their role in facial expression.	C2		
	• Describe facial nerve palsy upper and lower motor neuron.	C3		
	• Discuss nerve supply of face.	C1		
	• Discuss superficial and deep vasculature of face.	C1		
	• Map the outline of facial artery and vein on simulated patient / model.	P+A		
	• 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		
Scalp and temple	• Explain the extent of scalp	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Describe the Scalp layers, nerves &vessels	C2		
	• Discuss the clinical correlates like scalp injuries and scalp wounds.	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		
Orbit	• Discuss its location, surfaces and borders	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Describe its muscular and ligamentous attachment.	C2		
	• Describe eyeball movements in relation to recti and oblique muscles.	C2		
	• Discuss role of levator palpebrae superioris	C2		
	• Discuss clinical correlations of different coats of eyeball.	C2		
	• Explain extent and subdivisions of pharynx	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		
Eyeball	• Describe anatomy of eyeball with suspensory apparatus.	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Discuss different coats of eyeball with their nerve and blood supply.	C2		
	• Discuss refractive media and compartments of eyeball.	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		
Eyelid & lacrimal app	• Discuss the different components of lacrimal apparatus	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Describe the lacrimal gland and its neurovascular supply	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		
Parotid & Temporal Region	• Describe boundaries of parotid region.	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Discuss surfaces, innervation and relations of parotid gland.	C2		
	• Understand the bio-physiological aspects of arches	C2		
	• Map the outline of parotid gland and duct on simulated patient / model.	P+As		
	• 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		
Infra temporal Fossa	• Discuss the boundaries and contents of temporal region.	C2	Skills Lab	MCQ SAQ VIVA OSPE
	• Describe the temporalis muscle and its relations	C2		
	• Enumerate the boundaries and contents of infratemporal region.	C1		
	• Discuss muscles of mastication	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		

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 & Medal 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 pharynges tympanic 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 carious sinuses in radiographs	C1		
	• Describe anatomy of external nose and features of nasal septum, side and anatomical position.	C2		

	• Describe details of olfactory receptors and formation of olfactory nerve.	C2		OSPE
	• Discuss blood and nerve supply of external nose and nasal septum.	C2		
	• Explain functions of nose.	C2		
	• Discuss in detail clinical correlates of external nose and nasal septum. Lateral nasal wall and their importance.	C2		
	• Discuss on clinical importance of nasal cavity.	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		
Cross Sectional Anatomy	Identify the structures at • 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.	• Define boundaries of Norma frontalis and verticalis. • Enumerate their muscle attachment. • Describe and features of its structure • Read relevant research article	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 823-8291). • https://youtu.be/rr3-V7Qhf8E • https://youtu.be/35Y71cRBqs8
External Surface of Cranial Base Norma Basalis.	• Describe bones forming the base of skull • Explain the details of anterior, middle and posterior part of base of skull • Identify different foramina and structures passing through them. • Explain the attachments and relations of base of skull. • Fracture of cranial base • Head injuries and intracranial hemorrhage • Read relevant research article	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, P829-836). • https://youtu.be/6ZjJPLOJ0N8 • https://youtu.be/75lLaDFJTP4 • https://youtu.be/fteiKT_wQDE
Lateral & Occipital Aspect of Cranium Norma Lateralis. Norma Occipitalis	• Enlist various bones in normal lateralis. Describe the cranial and facial subdivision. • Define external acoustic meatus, • Discuss attachments of mastoid and styloid process. • Explain the boundaries of Norma occipitalis. • Identify different foramina and structures passing through them at the base.	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 827-829). • https://youtu.be/tkpzPMXzwiM • https://youtu.be/9Msvtw5CjFY

	• Explain its attachments and relations. • Read relevant research article	
Mandible	• Define location of mandible • Describe parts of mandible • Explain structural features of each part • Enlist attachments of each part • Describe blood and nerve supply of mandible. • Interpret applied anatomy of mandible. • Read relevant research article	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Pae 827). • https://youtu.be/_lHosB-c_fQ • https://youtu.be/Qc0yscwMJg4
Temporomandibular joint	• Discuss the temporomandibular joint, its type, formation, and neurovascular supply • Describe the movement's axis and muscles involved. • Correlate clinically disorders of the temporo- mandibular joint. • Read relevant research article	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 916-920). • https://youtu.be/6tJsi5oghNY • https://youtu.be/0BKU04QLzV0
Orbit	• Discuss its location, surfaces and borders • Describe its muscular and ligamentous attachment. • Describe eyeball movements in relation to recti and oblique muscles. • Discuss role of levator palpebrae superioris • Discuss extraocular muscles of orbit. • Supporting apparatus of eyeball. • Nerves of eye ball • Vasculature of orbit • Read relevant research article	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 889-906). • https://youtu.be/HKEA4p5k66U • https://youtu.be/Oz4kGGiJNrA
Temporal Region	• Describe boundaries of parotid region. • Discuss surfaces, innervation and relations of parotid gland. • Understand the bio-physiological aspects of arches • Read relevant research article	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 914-916). • https://youtu.be/HB6bN-rs2NU • https://youtu.be/zo7DDK-h1Mg

Infra temporal Fossa	• 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 • Read relevant research article	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 916-926). • https://youtu.be/z2GlluoOtMY • https://youtu.be/ixCCX46XWHA
Pterygopalatine Fossa	• Discuss the boundaries and contents of pterygopalatine fossa. • Discuss the communications of pterygopalatine fossa. • Understand the bio-physiological aspects of arches • Read relevant research article	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 951-954) • https://youtu.be/9taW-Th3ycc • https://youtu.be/o_JbDynMZjo
External & Middle Ear	• Describe parts of the ear. • Discuss walls and contents of external and middle ear , • Discuss their blood and nerve supply. • Explain pharyngo tympanic tube, mastoid antrum and air cells. • Relation of chorda tympani and facial nerve. • Discuss Mastoiditis and tubal blockage • Read relevant research article	• Clinical Oriented Anatomy by Keith L. Moore.6TH Edition. (Chapter 7, Page 966-973). • https://youtu.be/VRLm7cpmZSk • https://youtu.be/unDpXRE_PPA

Practicals				
Topics	**At the End of Demonstration Student Should Be Able To**	**Learning Domains**	**Teaching Strategy**	**Assessment Tools**
Cornea	• Identify the histological slide cornea. • Illustrate the microscopic picture of Cornea. • Enlist two points of identification of each • Read a relevant research article	P C2 C1 C3	Skill Lab	OSPE
Retina	• Identify the histological slide of retina. • Illustrate the microscopic picture of retina • Enlist two points of identification • Read a relevant research article	P C2 C1 C3	Skill Lab	OSPE
Ear	• Identify the histological slide of ear • Illustrate the microscopic picture of ear • Enlist two points of identification of each • Read 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	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	• 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)	• https://www.britannica.com/science/human-eye • https://youtu.be/laEFdlxW0rA	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	1.Describe physiology of external ear 2.Describe physiology of middle ear 3. Explain structure of middle ear	• 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	• https://youtu.be/VRLm7cpmZSk • https://www.sciencedirect.com/science/article/pii/S0378595522002192	1. C2 2. C2 3. C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment)

		364-371) • 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	• 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)	• https://youtu.be/CKtLlOSh8o4 • 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	• 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)	• 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	3. Describe the mechanism of activation of Rods 4. Explain the photochemistry of color vision	• 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)	Vision_19676/ 2. https://youtu.be/k9lrM5iPNuY	4. C2		SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
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.	• 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&topicKey=PC%2F15359&source=see_link	1. C2 2. 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	1. Explain the neural circuitry of the Retina 2. Describe the physiology of visual pathway 3. Name the optic lesion associated with visual pathway	• 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)	**1.** https://youtu.be/wiYmTAuVimg 2. https://youtu.be/cG5ZuK0_qtc 3. https://teachmeanatomy.info/head/cranial-nerves/optic-cnii/	1.C2 2.C2 3.C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Vestibular system	1. Describe the function of the organ of corti 2. Explain vestibular system	• 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)	1. https://www.physio-pedia.com/Vestibular_System 2. https://youtu.be/ryGMI3SpxCE 3. https://youtu.be/mcp7qLh8_5c	1. C2 2. C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Lesions of visual pathway and its effects on field of vision, Movements of eye ball along with neural control	1. Explain the muscular control of eye movement 2. Describe the fixation movements of eye 3. Define accommodation reflex and pupillary light reflex 4. Name the optic lesion associated with visual pathway	• 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)	1. https://youtu.be/evLyI35m8xU 2. https://teachmeanatomy.info/head/organs/eye/extraocular-muscles/	1. C2 2. C2 3. C2 4. C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Sense of Taste and pathophysiology	• List the primary sensation of taste • Explain the mechanism of taste perception and its transmission into central nervous system	• 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)	1. https://youtu.be/K9JSBzEEA0o 2. https://youtu.be/mFm3yA1nslE 3. https://www.sciencedirect.com/topics/nursing-and-health-professions/taste	1. C1 2. C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Physiology of accommodation and clinical abnormalities	1. Define accommodation reflex and pupillary light reflex 2. Explain Clinical abnormalities associated with accommodation	• 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)	1. https://youtu.be/xj0blrAx3_s 2. https://teachmephysiology.com/nervous-system/ocular-physiology/ocular-accommodation/	1. C1 2. C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Sense of Smell and pathophysiology	1. List the primary sensation of smell 2. Describe the stimulation of olfactory cells and its transmission into central nervous system	• 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)	1. https://www.alimentarium.org/en/fact-sheet/senses-smell 2. https://youtu.be/mFm3yA1nslE	3. C1 4. 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	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	• 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)	1. https://www.britannica.com/science/human-eye 2. https://youtu.be/laEFdlxW0rA	1.C2 2. C2 3. C2 4.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	• 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 impendence matching and attenuation reflex 3. Explain the conduction of sound waves in the cochlea	• 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 Aseessment, 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	• 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/mFm3yA1nslE 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/mFm3yA1nslE	1.C1 2.C2 3.C1 4.C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Topics Of SDL	Learning Objective	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools

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	• 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 Aseessment, 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 impendence matching and attenuation reflex 3. Explain the conduction of sound waves in the cochlea	• 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 Aseessment, 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.	• 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 Aseessment, MST based Assessment) OSPE SDL Evaluation

			Key=PC%2F15359&source=see_link			
OFF CAMPUS Introduction to Physiology of Eye & Optics of vision. General Principles of optics, Physiological basis for errors of refraction	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	• 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)	• https://www.britannica.com/science/human-eye https://youtu.be/laEFdlxW0rA	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	1.Describe the formation and circulation of aqueous humor 2.Explain the mechanism of regulation of intraocular pressure 3.Define glaucoma and its treatment	• 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)	• https://youtu.be/CKtLlOSh8o4 • https://youtu.be/7CFY4gxLnMY • https://my.clevelandclinic.org/health/body/24611-aqueous-humor-vitreous-humor	1. C2 2. C2 3. C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Photochemistry of vision	1. Describe the physiology of retinal layers 2. Explain photochemistry of vision (rhodopsin - retinal)	• Ganong's Review of Medical Physiology.25TH Edition.Section 02,Vision (Chapter 09, Page 182)	3. https://www.brainkart.com/article/Photochemistry-of-Eye-Vision_19676/	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	• 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			Aseessment, MST based Assessment) OSPE SDL Evaluation
Vestibular system	1. Describe the function of the organ of corti 2. Explain vestibular system	• 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)	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 Aseessment, 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	• 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)	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 Aseessment, MST based Assessment) OSPE SDL Evaluation
	1. List the primary sensation of smell	• 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	• 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)	7. sheet/senses-smell https://youtu.be/mFm3yA1nslE		SDL	MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation

Practicals					
Topic	**Learning Objectives**	**Reference**	**Learning Domains**	**Learning Strategy**	**Assessment Tools**
Estimation of Visual Acuity	• 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 Assissted Assessment
Examination of 8th Cranial Nerve (vestibular function)	• 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 Assissted Assessment

Performance of Hearing Test (cochlear function)	• 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 Assissted Assessment

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. Classify Receptors	C1 C2	LGIS	MCQs, SAQs& Viva
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. Discuss related clinical disorders	C2 C3	LGIS	MCQs, SAQs & Viva
Role of vitamin A in vision	Explain the role of vitamin A in vision. Discuss related clinical abnormalities	C2 C3	LGIS	MCQs, SAQs & Viva

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	• Explain synthesis & functions of neurotransmitters • Discuss related clinical disorders	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 13, 21 page 166 & 317 - 319) • Use digital library ◦ 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%C2%A0%2D%20Scientific%20American%2C%201974%20%2D%20JSTOR
Receptors	• Define receptors • Classify Receptors	• Text book of Biochemistry Lehninger 8th edition (Chapter 12, page 439- 440) • Use digital library ◦ 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	• Explain the structure and function of G proteins	• Harper's Illustrated Biochemistry 32th edition (Chapter 42, page 503 – 505) • Use digital library

		• 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	• Explain the role of vitamin A in vision • Discuss related clinical abnormalities	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 28, page 433-434) • Use digital library • 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	• Describe different types of second messengers	• 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	• Introduction to Plastic Surgery	C2	LGIS	MCQ
Burn	• Define Burn	C1	LGIS	MCQ
	• Types of Burns	C2		
	• Classification of Burns			
	• Percentages of Burn			
Burn Managment	• Approach toward Burn patient?	C1	LGIS	MCQ
	• Physiological changes because of Burn	C2		
	• Importance of Fluid Management in burn			
Foot Ulcer	• Classify Foot Ulcer	C1	LGIS	MCQ
	• Differentiate among Venous/Arterial /Traumatic and Diabetic Ulcer	C2		
	• Grading of Diabetic foot ulcers	C3		
Skin ulcer	• Classify Skin Ulcers	C1	LGIS	MCQ
	• Differentiate between marjolin ulcer, basal cell carcinoma and squamous cell carcinoma	C2	LGIS	MCQ

Peadiatrics				
Theory				
Topic	**At the End Of Lecture, Students Should Be Able To:**	**Learning Domain**	**Teaching Strategy**	**Assessment Tools**
Preventive Pediatrics	• Classify the degree of malnutrition in a malnourished child	C1	LGIS	MCQs
	• 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	• 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	• Know various cases of deafness	C1	LGIS	MCQs,
	• 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	• Should define the turns	C1	LGIS	MCQs,
	• Know various causes of DNS and Rhinitis	C1		
	• Must be able to know treatment of all.	C1		
	• Know definition of polyp	C1		

Nasal polyp	• Know different types of nasal Polyps, their etiology, pathophysiology and treatment	C1	LGIS	MCQs,
	• Know latest management	C1		
Diseases of External Nose	• Know various diseases of external nose, their etiology	C1	LGIS	MCQs,
	• Pathophysiology and know how to treat them	C1		
Ear Discharge	• Know Various cases of ear discharge	C1	LGIS	MCQs,
	• Understand the etiology, Pathology of various cases of ear discharge in external and middle ear.	C2		
	• Know how to treat these causes.	C1		
Dizziness and Vertigo.	• Recognise signs and symptoms of acoustic neuroma.	C1	LGIS	MCQs,
	• Identify treatment options and risks	C2		
Facial fractures	• Classify facial fractures	C1	LGIS	MCQs,
	• Enumerate treatment options for facial fractures	C2		
Sinusitis	• Classify Sinusitis	C1	LGIS	MCQs,
	• Enlist clinical features of sinusitis.	C2		
Hearing Problems in Children	• Define deafness	C1	LGIS	MCQs,
	• State the aetiology of hearing loss	C1		
	• Elaborate the types of hearing loss	C1		
	• Discuss the investigations of hearing loss	C2		
	• 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,
	• Types			
	• Treatment			
	ColourVison			
	• Types			
	• Inheritence			
	• Gender Predisposition			
	Night Blindness	C1		
	• Etiology			
	• Treatment			
Glaucoma	Glaucoma	C1	LGIS	MCQs,
	• What is Glaucoma			
	• Classification			
	• Treatment			
Cataract	Cataract	C1	LGIS	MCQs,
	• Define			
	• Types of cataract			
	• Surgical procedures			
	Ocular Trauma	C1		
	• Blunt			
	• Penetrating			

Ocular trauma & Ocular Procedures	• Chemical Burns		LGIS	MCQs,
	• Laceration			
	Ocular Procedures	C1		
	• Cataract surgeries			
	• Glaucoma Surgeries			
	• Laser And refractive Surgeries			
Cornea	Corneal Ulcer	C1	LGIS	MCQs,
	• Bacterial			
	• Viral			
	• Fungal			
Conjunctivitis	• Define conjunctivitis	C1	LGIS	MCQs,
	• Discuss the causes & types			
	• 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	• 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	• Assignment based assessment involving real life case scenarios under aggregate Marks. (Internal Assessment) • Assignment to be uploaded on LMS

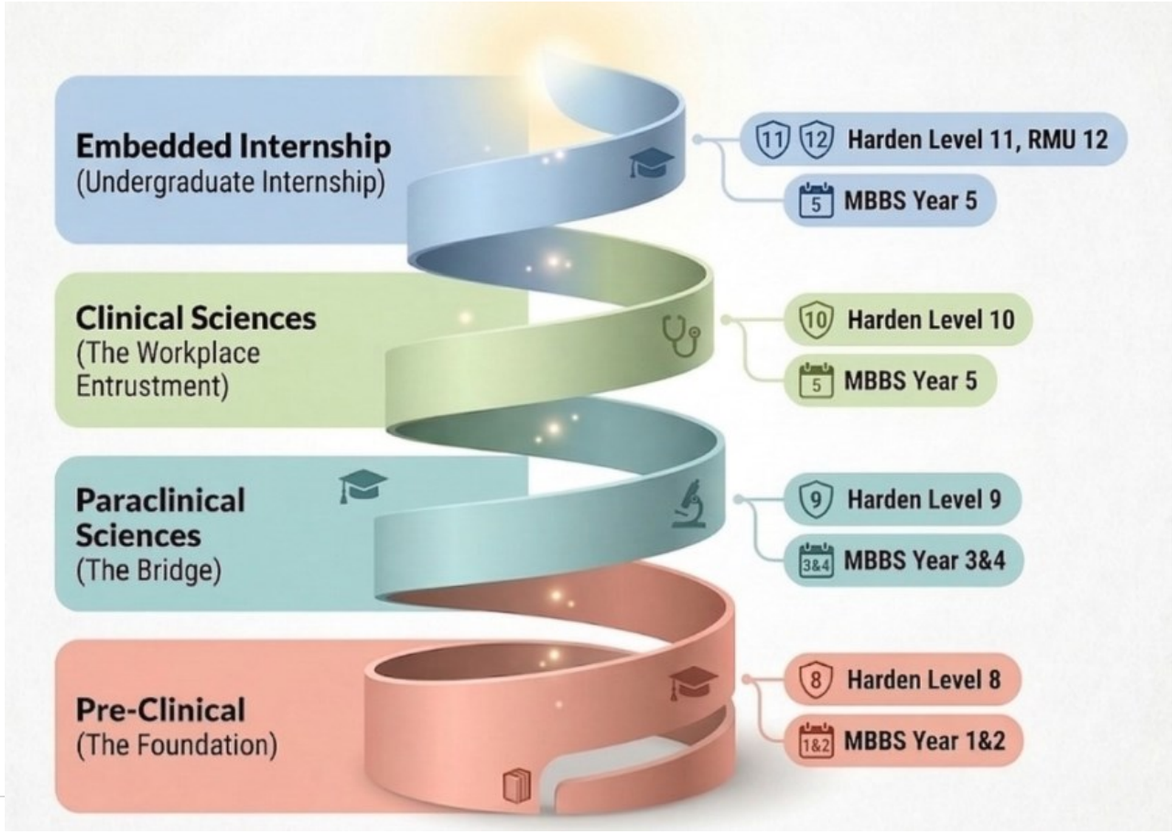
Behavioural Sciences				
Theory				
Topic	**At The End Of Lecture, Students Should Be Able To:**	**Learning Domain**	**Teaching Strategy**	**Assessment Tools**
Perception	• To be able to define perception and basic perceptual abilities. • To identify abnormalities of perceptions and their role in disease causation	C2	LGIS	MCQs,
Sleep and arousal	• To be able to understand the physiology of sleep. Disorders of sleep and their management	C2	LGIS	MCQs,

➢ **Endocrinology Module-I**

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



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

Module Task Force Team		
1.	Coordinator	Dr. Sidra Hamid (Assistant Professor of Physiology)
2.	DME Focal Person	Dr. Farzana Fatima
3.	Co-coordinator	Dr. Sadia Baqir (Senior Demonstrator of Anatomy)
4.	Co-Coordinator	Dr. (Demonstrator of Biochemistry)
5.	Co-coordinator	Dr. Aneela Yasmeen (Senior Demonstrator of Physiology)

DME Implementation Team		
1.	Director DME	Prof. Dr. Ifra Saeed
2.	Assistant Director DME	Dr Farzana Fatima
3.	DME Implementation Team	Prof. Dr. Ifra Saeed Dr. Farzana Fatima Dr. Saira Aijaz
4.	Editor	Muhammad Arslan Aslam

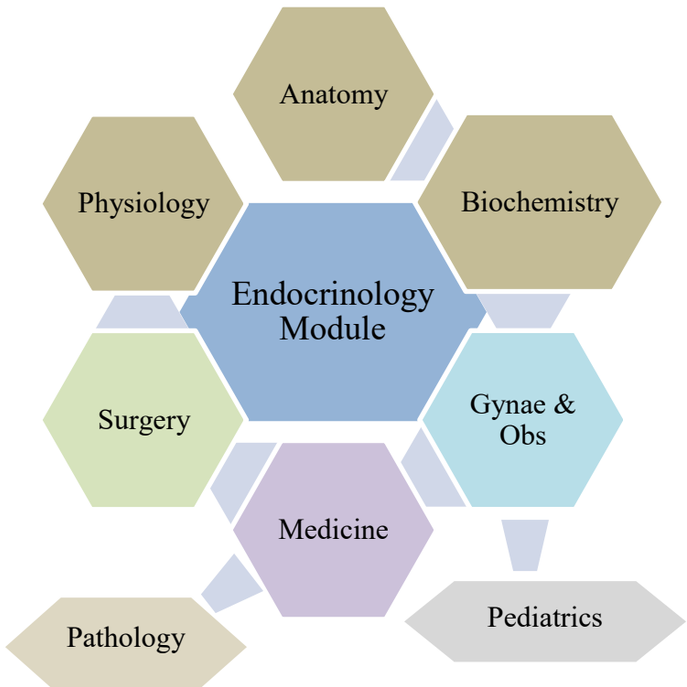
Themes							
Block	**Subjects**	**Embryology**	**Histology**	**Histology Practical SKL. Lab.**	**Gross Anatomy**	**CBL**	**SDL**
III	• Anatomy	• Development of pituitary & pineal gland • Developmnt of thyroid & parathyroid gland • Developmnt adrenal gland and pancreas	• Pituitary & pineal gland • Thyroid & parathyroid gland • Adrenal gland and pancreas	• Pituitary Gland • Thyroid & parathyroid gland • Adrenal gland • Pancreas	• Bones of neck. Hyoid Bone & Cervical vertebrae • Fascias of Neck • Superficial structurs of neck • Lateral-cervical region (muscles & triangles) • Latera-cervical-region (neurovascular organization) • Interior-cervical region(muscles) • Interior-cervical region (vessels of neck & cervical plexus) • Submandular region • Soft palate • Deep structures of neck • Root of neck • Thyroid&Parathyroid gland • Larynx • Pharynx • pancreas		• Bones of neck • SCM region & superficial & deep fascia • lateral cervical region • Anterior Triangle of neck & its subdivisions • Thyroid and para thyroid gland • Online SDL Evaluation • soft palate, larynx
	• Physiology	• 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					
	• Biochemistry	• Classification of hormones, Thyroid hormones, Adrenal hormones, Insulin and glucagon, Blood glucose regulation, Calcium revisit					
	Spiral Courses						
	• The Holy Quran Translation	•					
	• Islamiayat	•					
	• Biomedical Ethics	• 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	

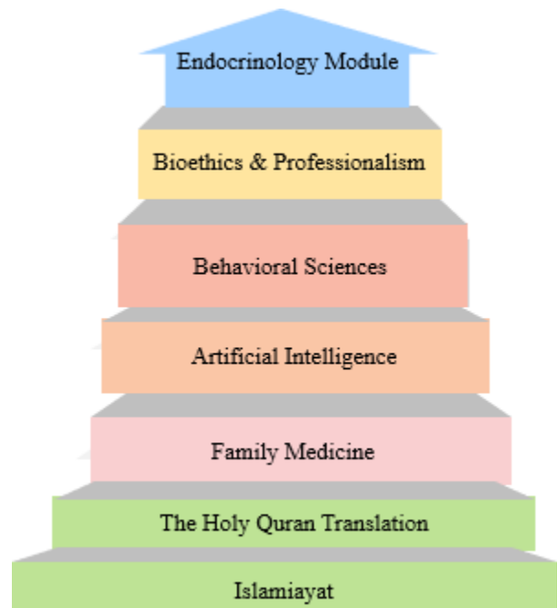
Implementation of Terms of Reference (TORS)

- 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

s

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	• 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	• MCQS • SEQS • VIVA
Histology of thyroid and parathyroid glands	• 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	• MCQS • SEQS • VIVA
Histology of adrenal gland	• 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	• MCQS • SEQS • VIVA
Development of pituitary and pineal gland	• 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	• MCQS • SEQS • VIVA

Development of thyroid and parathyroid glands	• 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	• MCQS • SEQS • VIVA
Development of adrenal gland	• 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	• 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	• Describe the borders and surfaces of body and the two cornuas of hyoid bone.	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss the attachments on the hyoid bone.	C2		
	• Discuss the related applied of hyoid.	C2		
	• Describe anatomical features of cervical typical & atypical vertebrae .	C2		
	• Discuss the intervertebral joints& movements of cervical region of vertebral column.	C2		
	• Discuss the anatomical basis of cervical pain & injuries of cervical vertebral column	C2		
	• Read relevant research article	C3		
	• Use digital library.	C3		
Fascias of Neck.	• Understand cervical subcutaneous tissue & platysma.	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss the deep cervical fascia and the formation of layers due to its condensation.	C2		
	• Discuss the attachments and special features of the investing layer.	C2		
	• Describe the attachments and special features of prevertebral fascia.	C2		
	• Describe the attachments and special features of pretracheal fascia.	C2		
	• Discuss the carotid sheath formation, contents and relations.	C2		
	• 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		

	• Use digital library	C3		VIVA OSPE
Thyroid and para thyroid glands	• Discuss anatomy & functions of thyroid & parathyroid gland	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss blood supply of thyroid gland	C2		
	• Discuss lymphatic drainage & nerve supply of thyroid gland	C2		
	• Discuss related clinicals.	C3		
	• Read a relevant research article	C3		
	• Use digital library	C3		
larynx	• Discuss larynx in detail with its cartilages and muscles.	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss blood supply of larynx	C2		
	• Discuss functions of larynx • Discuss trachea (revisit).	C2		
	• Discuss related clinicals	C3		
	• Read a relevant research article	C3		
	• Use digital library	C3		
Pharynx	• Tabulate muscles of pharynx with origin, insertion, nerve supply and actions	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Discuss nerve supply of Pharynx	C2		
	• Discuss blood supply of larynx	C2		
	• Discuss esophagus (revisit)	C2		
	• Discuss related clinicals	C3		
	• Read a relevant research article	C3		
	• Use digital library	C3		
Pancreas & Adrenal gland	• Describe location of pancreas & Adrenal gland	C2	Skill lab	MCQS SEQS VIVA OSPE
	• Enlist different parts of pancreas	C2		
	• Describe relations of pancreas	C2		
	• Discuss blood supply of pancreas	C2		
	• Discuss the clinical Anatomy of pancreas	C3		
	• Discuss related clinicals	C3		
	• Read a relevant research article	C3		
	• 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	• 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	• 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)	• 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	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	• 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	• 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)	• 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

	hormone in soft tissue and bone growth • Discuss role of somatomedins in relation with growth hormone • Explain regulation of secretion	• 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	• 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 Differentiate different classes of hormones	• 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)	• 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	C2 C1 C2 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Abnormalities of growth hormone secretion	• Enlist abnormalities of GH secretion • Describe pan hypopituitarism • Discuss in detail dwarfism & its treatment • Explain gigantism & acromegaly • Differentiate gigantism & acromegaly	• 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	1. https://youtu.be/0GuRf5YPGiA 2. 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. 8TH Edition.(Chapter 23,Page 775) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 76, Page 936)				
Insulin and glucagon: Structure and metabolic functions	• 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	• 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)	• 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	• 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

		Practice by Best & Taylor's.13th Edition. Section 07(Chapter 51,Page 849) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 76, Page 938)				
Regulation of blood Glucose & Diabetes mellitus	• 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	• 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)	1. https://youtu.be/KY85BUcQZew 2. https://www.pharmaguideline.com/2022/01/hormonal-regulation-of-blood-glucose-level.html 3. https://www.medicalnewstoday.com/articles/316427	C1 C2 C2 C2 C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Aldosterone and cortisol	• 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	• 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)	1. https://youtube/2-Z3Q6BZuBY 2. https://journals.physiology.org/doi/abs/10.1152/ajplegacy.1964.207.1.109 3. 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

	• 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	• 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	• 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	• 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)	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	• Discuss in detail Cushing's syndrome • Differentiate between Cushing disease and Cushing's syndrome • Discuss adrenogenital syndrome • Discuss the physiological anatomy of adrenal medulla	• Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 20, Page 364-373) • Physiology by Linda S. Costanzo 6th Edition. Endocrine	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	• 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	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.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	• Describe mechanism of action of thyroid hormone • Explain physiological functions of thyroid hormone	• 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)	1. https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/thyroid-hormone-release 2. https://youtu.be/IXjRsX50JB4 3. 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	• Discuss normal levels and metabolism of calcium and phosphate • Describe the effects of hypocalcemia & hypercalcemia • Explain the absorption and	• Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 21, Page 375-386) • Physiology by Linda S.	1. https://youtu.be/JYQL7JEsF_4 2. https://teachmephysiology.com/biochemistry/electrolytes/calcium-regulation	C2 C1 C2 C2 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS

hormone and calcitonin)	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	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.14th Edition..Section 14. (Chapter 80, Page 991)		C1 C1 C2 C1		based Aseessment, MST based Assessment) OSPE
Abnormalities of thyroid hormone (Goiter, hypothyroidism and hyperthyroidism)	• 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	• 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)	1. https://www.hopkinsmedicine.org/health/conditions-and-diseases/disorders-of-the-thyroid 2. https://youtu.be/0vnpmaSI57c	C1 C2 C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Bone pathophysiology	• Discuss in detail hypoparathyroidism • Describe hyperparathyroidism	• Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 21,	1. https://www.orthobullets.com/basic-science/9031/rickets 2. https://youtu.be/Srm2GH1dus	C2 C1 C1		MCQ SEQ

(rickets, osteomalacia, osteoporosis, hypo and hyperparathyroidism)	• Describe osteoporosis	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)	g 3. https://www.webmd.com/osteoporosis/what-is-osteomalacia		LGIS	VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Topic	At The End Of Lecture Students Should Be Able To	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
Signal transduction & Growth hormone.	• 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	• 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)	• 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	1. C1 2. C1 3. C1 4. C2 5.C1 6.C2 7.C1	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Thyroid Hormones	• 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	• 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)	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	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Insulin and Glucose Metabolism	• 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	• 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	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Bone pathophysiology (rickets, osteomalacia, osteoporosis, hypo and hyperparathyroidism	• Discuss in detail hypoparathyroidism • Describe hyperparathyroidism Describe osteoporosis	• 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)	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)	• 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	• 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)	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	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Adrenal gland and its hormones (Fourth week)	• 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	• 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) 5. Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 14. (Chapter 78,Page 955)	1. https://youtube/2-Z3Q6BZuBY 2. https://journals.physiology.org/doi/abs/10.1152/ajplegacy.1964.207.1.109 3. 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

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	• 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	• 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	1. https://youtu.be/KY85BUcQZew 2,https://www.pharmaguideline.com/2022/01/hormonal-regulation-of-blood-glucose-level.html 3.https://www.medicalnewstoday.com/article	C1 C2 C2 C2 C2 C2 C2 C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS

	mellitus • Differentiate between type I & type II diabetes mellitus • Differentiate between diabetes mellitus & diabetes insipidus	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)	s/316427			based Aseessment,MST based Assessment) OSPE SDL Evaluation
Abnormalities of adrenocortical hormone	• 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	• 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.14th 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,MST based Assessment) OSPE SDL Evaluation
Bone pathophysiology (rickets, osteomalacia, osteoporosis, hypo and hyperparathyroidism)	• Discuss in detail hypoparathyroidism • Describe hyperparathyroidism • Describe osteoporosis	• 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

		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)				Aseessment,MST based Assessment) OSPE SDL Evaluation
(OFF CAMPUS) Hypothalamic–pituitary axis & GH	• 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	• 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)	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/	1. C1 2. C1 3. C2 4. C1 5. C1 6. C2 7. C2 8. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment,MST based Assessment) OSPE SDL Evaluation
Introduction to endocrinology & Signal transduction	• Classify hormones according to solubility and chemical nature • Describe the nature& synthesis of hormones • Differentiate different classes of hormones • Describe the secretion, transport,	• 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	https://youtu.be/QLcxQT1fb_c https://www.khanacademy.org/science/ap-biology/cell-communication-and-cell-cycle/cell-	C2 C1 C2 C1 C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS

	feedback control& clearance of hormones • Differentiate different classes of hormones	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)	communication/a/introduction-to-cell-signaling https://youtu.be/GHwMJnxaiys			based Aseessment,MST based Assessment) OSPE SDL Evaluation
Insulin and glucagon:	• 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	• 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	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment,MST based Assessment) OSPE SDL Evaluation
	• Describe physiological anatomy of adrenal gland • Enumerate its various hormones • Describe synthesis, transport & metabolism of adrenocortical hormones	• Ganong's Review of Medical Physiology.25TH Edition.Section 03 (Chapter 20, Page 351-364) • Physiology by Linda S. Costanzo 6th Edition. Endocrine	1. https://youtube/2-Z3Q6BZuBY https://journals.physiology.org/doi/abs/10.1152/ajplegacy.1964.207.1.109	C1 C1 C1 C1 C2 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS

Aldosterone and cortisol	• 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	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)	https://www.britannica.com/science/aldosterone	C1 C2 C2 C1 C2 C1 C2		based Aseessment,MST based Assessment) OSPE SDL Evaluation
Thyroid hormone:	• 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	• 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,MST based Assessment) OSPE SDL Evaluation
	• Enlist disorders of thyroid gland	• Ganong's Review of Medical	https://www.hopkinsm	C1		

Abnormalities of thyroid hormone (Goiter, hypothyroidism and hyperthyroidism)	• 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.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)	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 Aseessment,MST based Assessment) OSPE SDL Evaluation
Calcium homeostasis (Vitamin D, parathyroid hormone and calcitonin)	• 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	• 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.14th Edition..Section 14. (Chapter 80, Page 991)	1. https://youtu.be/JYQL7JEsF_4 2.https://teachmephysiology.com/biochemistry/electrolytes/calcium-regulation	C2 C1 C2 C2 C1 C2 C1 C1 C2 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment,MST 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	• 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 Assissted Assessment
Checking for color vision	• 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 Assissted Assessment
Revision of practical	• Revision	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	A3/P3	Practicals/skill lab	Viva Voce Ospe Video Assissted Assessment

Biochemistry				
Theory				
Topic	**Learning Objectives** **At The End Of Lecture Students Should Be Able To**	**Learning Domain**	**Teaching Strategy**	**Assessment Tool**
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, 8th 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	• Elaborate the nature, formation, mechanism of action and related diseases of Thyroxin	C2	SDL	MCQs SAQs Viva	1. Harper's Illustrated Biochemistry 32nd edition, chapter 41, pages 492-493 and 498 2. 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	• Describe synthesis, mechanism of action and functions of Aldosterone, Cortisol and Adrenal androgens • Discuss related clinical disorders	C2	SDL	MCQs SAQs Viva	1. Harper's Illustrated Biochemistry 32nd edition, chapter 41, pages 485-488, 491- 492, and 495-496, 498-499 2. Lippincott Illustrated Reviews, Biochemistry, 8th Edition, chapter 18, pages 262-266 https://www.ncbi.nlm.nih.gov/books/NBK470339/
	• Describe mechanism of action and role of Adrenal Medullary Hormones • Discuss related diseases	C2			

					https://www.youtube.com/watch?v=JlI5N2N4d-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	• 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, 8th 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	• 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	1. Harper's Illustrated Biochemistry 32nd edition, chapter pages 719-720, 136-138 & 469-470 2. Lippincott Illustrated Reviews, Biochemistry, 8th Edition, chapters 23 & 25, pages 350-354 & 375-387 https://www.ncbi.nlm.nih.gov/books/NBK532915/ https://www.youtube.com/watch?v=SRZlYdQWO3g https://www.ncbi.nlm.nih.gov/books/NBK279052/ https://www.youtube.com/watch?v=jCf7W1U4JKE https://www.ncbi.nlm.nih.gov/books/NBK534841/

Practicals				
Topic	**At The End Of Practical Students Should Be Able To**	**C/P/A**	**Teaching Strategy**	**Assessment Tool**
Estimation of Blood Glucose	• Perform estimation of glucose by spectrophotometer	P	Skill lab	OSPE
GTT	• 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 ableto**	**Learning Domains**
Anatomy	• Multi Nodular Goitrewith Hypothyroidism	Apply basic knowledge of subject to study clinical case.	C3
	• Torticollis	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• AdrenocorticalHormone	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 of should be able to:**	**LearningDomain**	**TeachingStrategy**	**AssessmentTool**
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 • Hyperparathyroidism (primary and secondary)	C2		
	• Describe the pathogenesis of Rickets and • Osteomalacia	C2		
	• Describe the pathological features of Osteoporosis andosteopetrosis	C2		
Adrenocortical disorders	• Define and discuss pathogenesis of	C2	LGIS	MCQ's
	• Addison's disease and Conn's syndrome	C2		
	• Describe the pathogenesis of Cushing syndrome	C2		

	• Explain dexamethasone suppression test and its role in diagnosis	C2		
Diabetesmellitus	• Define diabetes	C1	LGIS	MCQ's
	• Classify diabetes	C2		
	• Discuss pathogenesis of type I and type II diabetes mellitus	C2		
Diagnosis of Thyroid	• Define hypothyroidism and hyperthyroidism	C1	LGIS	MCQ's
	• Extract lab diagnosis of hypothyroidism and hyperthyroidism	C2		
	• 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	• Discuss discuss pathophysiology, clinical manifestations of hypothyroidism and hyperthyroidism	C2	LGIS	MCQ
	• Workup and management	C2		
Hypocalcemia and hypercalcemia	• Discuss pathophysiology, clinical manifestations of hypocalcemia and hypercalcemia	C2	LGIS	MCQ
	• Workup and management	C2		
Diabetes mellitus	• Discuss pathophysiology, clinical manifestations of type I and type II diabetes mellitus	C2	LGIS	MCQ
	• Discuss Workup and management	C2		
Syndrome of inappropriate ADH secretion (SIADH).	• Define and discuss pathophysiology	C2	LGIS	MCQs
	• Discuss the causes	C2		
	• Describe clinical features	C2		
	• Describe the management	C2		
Cushing syndrome	• Define and discuss pathophysiology	C1	LGIS	MCQs
	• Discuss the causes	C2		
	• Describe clinical features	C2		
	• Describe the management	C2		

Surgery				
Theory				
Topic	**At the end of this LGIS students of should be able to:**	**Learning Domain**	**TeachingStrategy**	**AssessmentTool**
Thyroid	• Enlist swellings infront of neck	C1	LGIS	MCQ
	• How to differentiate swellings in neck	C2		
	• Explain What is Hyperthyroidism	C2		
	• What is Hypothyroidism	C2		
	• Appreciate MNG	C2		
	• Appreciate Solitary Nodule	C2		
	• Appreciate Toxic Nodule	C2		
	• Outline the investigations for Thyroid pathologies	C2		
	• Outline the Management of different thyroidPathologies	C2		
AdrenalTumours	• Enlist hormones secreted by Adrenal Gland	C2	LGIS	MCQ
	• Describe Clinical Manifestations of differentadrenal disease	C2		
	• Outline the management plan	C2		
Diabetic foot	• Describe Diabetic Foot	C2	LGIS	MCQ
	• Classify Diabetic foot	C1		
	• Describe Pathophysiology of Diabetic foot	C2		
	• 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: • Know why pregnancy is a diabetogenic state	C2	LGIS	MCQs
	• Define gestational diabetes mellitus (GDM)	C1		
	• Correlate clinical features with pathophysiology of GDM	C2		
	• Outline brief management plan for these conditions	C2		
	• Know the methods for screening of diabetes in pregnancy	C2		
	• Thyroid disorders:	C1		
	• Know pathophysiology of common thyroid disorders	C2		
	during pregnancy			
	• Understand clinical presentation of thyroid disorders inpregnancy	C2		
	• Comprehend effects of thyroid disorders on mother andfetus	C2		
Primary amenorrhoea/ delayed puberty	• Define primary amenorrhea, secondary amenorrhea andoligomenorrhoea.	C1	LGIS	MCQs
	• Enumerate the causes of amenorrhea: ➢ Hypothalamic ➢ Pituitary ➢ Ovarian ➢ Endometrial ➢ Structural	C1		
	• Understand physical and hormonal changes at puberty /secondary sexual characteristics	C2		
	• Know basic pathophysiology of disorders of puberty ➢ Precocious puberty ➢ Delayed puberty	C2		
	• 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)**

Radiology & Artificial Intelligence				
Theory				
Topic	**At The End Of Lecture Students Should Be Able To**	**Learning Domain**	**Teaching Strategy**	**Assessment Tool**
Basics of Radiology	• Categorize different tissues from most to least opaque on x-ray including: bone,soft tissue, air, metal, and fat	C2	LGIS	MCQs
	• Distinguish between the different types of contrast used in imaging exams and thepotential diagnostic benefits of each	C2	LGIS	MCQs

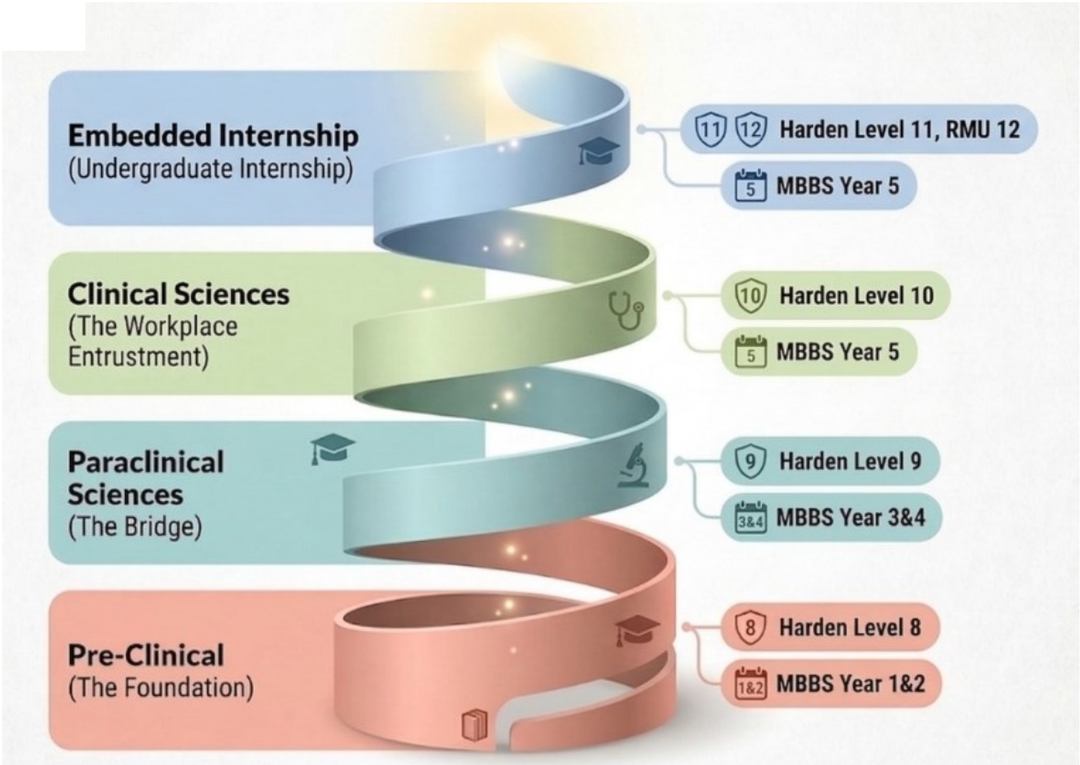
Behavioral Sciences				
Theory				
Topic	**At The End Of Lecture Students Should Be Able To**	**Learning Domain**	**Teaching Strategy**	**Assessment Tool**
Psychosocial Assessment	• To be able to do a detailed interview keeping in mind the psychological and socialaspects in predisposing, precipitating and maintaining diseases.	C2	LGIS	MCQs
Psychosocial Assessment	• 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	Discussion on Health Research ethics focusing; •Historical perspective of Tuskegee studies,Willow brook Experiment •Codes of medical ethics: traditional foundationsand contemporary practice •Nuremburg code, Belmont report, Declarationof 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 andjustice. - Interpretation research ethics for; - Informed consent and confidentiality inresearch HR	At the end of the session students should be able to; • Explain the meaning of the term "'ethics'".**C1** • Describe the historical perspective of global development of medical ethics. **C1** • Describe the codes of medical ethics and their implications.**C1** • Recognize ethical issues relevant to the case situation and apply the ethical codes as appropriate. **C2** • Discuss the development of indigenous ethical codes in the South-East Asian Region. **C2.** • Demonstrate sensitivity to cultural diversity in medical care.**C3**	LGIS 1hr contact session in 2-4 parallelclasses, Conducted by Senior faulty.	1 MCQs of level C1 to C3 will cover this session teachings in relevant block examination in pool of total04 MCQs. Result / marks obtained will contribute towards Internal assessment (IA) in 1st Prof. MBBS exam.	Guidelines and Teachers Handbook for Introducing Bioethics to Medical and Dental Students http://nbcpakistan.org.pk/assets/may-16-bioethics-facilitator-book---may-16%2C-2017.pdf The Nuremberg Code: http://www.hhs.gov/ohrp/archive/nurcode.html 10 WMA Declaration of Helsinki: http://www.wma.net/en/30publications/10policies/b3/ CIOMS Guidelines: http://www.cioms.ch/publications/layout_guide2002.pdf . Nuffield Council on Bioethics Guidelines: http://www.sirc.org/news/nuffield.shtml

SECTION – VIII

- **General Education Cluster Module (GEC)**

RMU – 12
Integrated Modular MBBS Curriculum 2026
Isolation to Beyond Boundaries



General Education Cluster Module

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.

Leadership: In an era where the healthcare landscape is rapidly evolving, effective leadership is crucial. This component aims to develop strategic thinking, management skills, and the ability to inspire and lead multidisciplinary teams with confidence and ethical integrity.

Information Technology and Artificial Intelligence: With the growing influence of technology in medicine, proficiency in IT and AI is essential. This section will cover the latest advancements in health informatics, digital health tools, and AI applications, preparing students to harness these technologies for enhanced patient care and research.

Entrepreneurship: Cultivating an entrepreneurial mindset will empower students to innovate and drive change within the healthcare sector. This segment will focus on business acumen, strategic planning, and the creation of impactful healthcare solutions.

Expository Writing: Effective communication is key to successful medical practice. This part of the module will refine students' writing skills, enabling them to articulate complex ideas clearly and persuasively, which is vital for academic publications and patient documentation.

Art and Humanities: The integration of art and humanities fosters empathy, cultural awareness, and ethical sensitivity, all of which are integral to holistic patient care. This section aims to broaden perspectives and deepen understanding of the human experience.

Research and Bioethics: Building on the foundation of research and bioethics covered earlier in the program, this module will advance students' ability to conduct ethical research and address complex bioethical issues in clinical practice and beyond.

Quran Translation and Islamiyat: As part of our commitment to cultural and religious literacy, the module will continue the study of Quran Translation and Islamiyat, emphasizing the integration of these teachings with medical ethics and practice.

By integrating these diverse yet complementary fields into the General Education Cluster, we aim to cultivate a generation of medical professionals who are not only skilled clinicians but also visionary leaders, adept communicators, and ethical practitioners. This holistic approach will prepare our graduates to meet the challenges of a dynamic healthcare environment with competence, compassion, and innovation.

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. The 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.

Outcomes

The General Education Cluster Module is designed to cultivate a comprehensive set of competencies across the domains of Knowledge, Skills, and Attitudes. The following general learning objectives outline the intended outcomes for students within this framework:

Domain of Knowledge

1. **Leadership and Management**
    - **Understand** the principles of effective leadership and management in healthcare settings, including team dynamics, strategic planning, and decision-making processes.
    - **Apply** leadership theories to real-world healthcare scenarios, demonstrating an understanding of how to lead and manage multidisciplinary teams effectively.
2. **Information Technology and Artificial Intelligence**
    - **Comprehend** the fundamental concepts of information technology and artificial intelligence as they pertain to healthcare.
    - **Analyze** the impact of digital health tools, electronic health records, and AI technologies on patient care and healthcare delivery.
3. **Entrepreneurship**
    - **Grasp** the basics of entrepreneurship, including business planning, innovation, and the healthcare market landscape.
    - **Evaluate** opportunities for entrepreneurial ventures within the healthcare sector, considering factors such as feasibility, impact, and sustainability.
4. **Expository Writing**
    - **Master** the conventions of expository writing, including structure, clarity, and argumentation.
    - **Understand** the importance of effective written communication in academic, clinical, and professional contexts.
5. **Art and Humanities**
    - **Recognize** the role of art and humanities in understanding human experiences and perspectives, and their influence on medical practice and patient care.
    - **Integrate** insights from art and humanities into a holistic approach to medicine that values cultural and emotional dimensions.
6. **Research and Bioethics**
    - **Acquire** knowledge of research methodologies, including qualitative and quantitative approaches, and their application in medical research.
    - **Understand** the ethical principles and guidelines governing medical research and clinical practice, and apply these principles to real-world scenarios.
7. **Quran Translation and Islamiyat**
    - **Understand** the key concepts and teachings of the Quran as they relate to ethical and moral decision-making in medicine.
    - **Apply** principles from Islamiyat to enhance ethical practice and cultural competence in a diverse healthcare environment.
8. **Pakistan Studies**

- Incorporating Pakistan Studies into the MBBS curriculum fosters a deeper understanding of the country's healthcare needs and cultural context. It enhances medical professionals' ability to address local health issues effectively and engage with diverse patient populations.

Domain of Skills

1. **Leadership and Management**
   - **Demonstrate** effective leadership and management skills by leading projects, resolving conflicts, and making informed decisions in healthcare settings.
   - **Develop** strategic plans and initiatives to address healthcare challenges and improve organizational outcomes.
2. **Information Technology and Artificial Intelligence**
   - **Utilize** information technology tools and AI applications effectively to enhance patient care, research, and operational efficiency.
   - **Assess** and implement technological solutions to address specific healthcare needs and challenges.
3. **Entrepreneurship**
   - **Create** and present business plans for innovative healthcare solutions, demonstrating entrepreneurial thinking and problem-solving skills.
   - **Evaluate** the feasibility and impact of entrepreneurial ventures through market research and strategic analysis.
4. **Expository Writing**
   - **Compose** clear, coherent, and well-organized expository texts, including research papers, case reports, and clinical documentation.
   - **Critique** and revise written work to improve clarity, accuracy, and effectiveness.
5. **Art and Humanities**
   - **Analyze** and interpret artistic and humanistic works to gain insights into diverse perspectives and experiences relevant to medical practice.
   - **Incorporate** humanistic approaches into patient interactions and healthcare delivery.
6. **Research and Bioethics**
   - **Conduct** rigorous and ethical research, including designing studies, collecting and analyzing data, and interpreting results.
   - **Navigate** ethical dilemmas in research and clinical practice with a well-founded understanding of bioethical principles.
7. **Quran Translation and Islamiyat**
   - **Translate** and interpret Quranic texts accurately and thoughtfully, applying relevant teachings to medical practice.
   - **Integrate** Islamic ethical perspectives into clinical decision-making and patient care practices.

Domain of Attitudes

1. **Leadership and Management**
   - **Cultivate** a proactive and collaborative attitude towards leadership and team management.
   - **Demonstrate** commitment to ethical leadership and continuous improvement in healthcare settings.
2. **Information Technology and Artificial Intelligence**
   - **Embrace** a positive attitude towards the adoption and integration of new technologies in healthcare.
   - **Show** openness to continuous learning and adaptation in response to technological advancements.
3. **Entrepreneurship**
   - **Foster** an entrepreneurial mindset characterized by creativity, resilience, and a willingness to take initiative.
   - **Commit** to ethical practices and social responsibility in entrepreneurial ventures.
4. **Expository Writing**
   - **Adopt** a meticulous and reflective attitude towards written communication, valuing clarity, accuracy, and engagement.
   - **Strive** for excellence in written expression and its impact on professional and academic success.
5. **Art and Humanities**

- **Appreciate** the significance of art and humanities in enriching medical practice and enhancing patient care.
- **Respect** diverse cultural and emotional perspectives and integrate them into medical interactions.

6. **Research and Bioethics**
   - **Adopt** a principled attitude towards ethical research and practice, emphasizing integrity, transparency, and respect for human subjects.
   - **Demonstrate** a commitment to ongoing ethical reflection and professional development.
7. **Quran Translation and Islamiyat**
   - **Show** respect for Islamic teachings and their relevance to ethical practice in medicine.
   - **Commit** to cultural and religious sensitivity in patient care and professional interactions.
8. **Pakistan Studies**
   - Promotes a sense of national identity and responsibility among future doctors.

These learning objectives are designed to ensure that graduates of the MBBS program are not only proficient in medical knowledge and clinical skills but also equipped with the critical thinking, ethical reasoning, and leadership abilities necessary to excel in a complex and evolving healthcare environment.

Alignment of RMU curriculum as per HEC Undergraduate Policy 2023 and guidelines of PMDC 2024

Title	Hours recommended by HEC/PMDC (to be covered from 1st to 4th year)	Teaching hours in RMU Curriculum
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

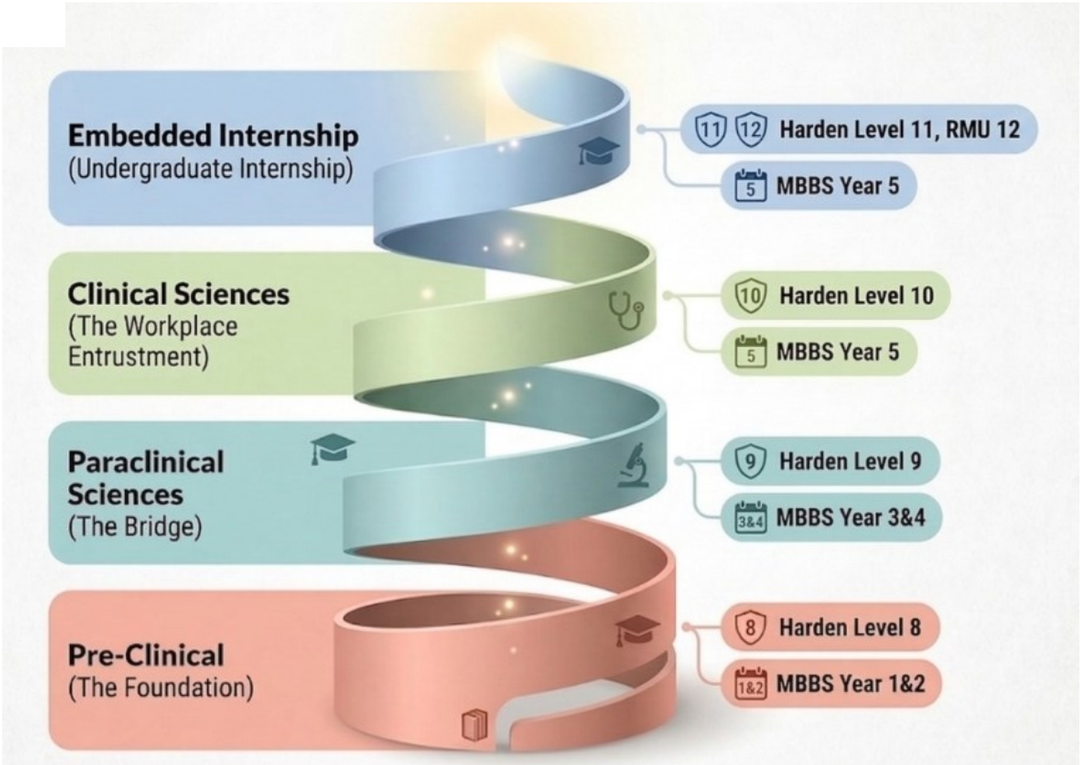
- 1 credit hour = 16 teaching hours
- The minimum requirement for the general education component is 30 credits in all the undergraduate/equivalent degree programs including associate degree.

References: undergraduate-policy-2023-1pdf/261474627

SECTION – IX

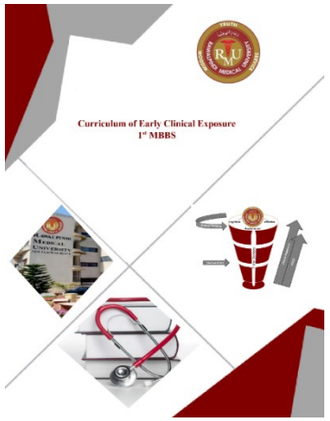
- Early Clinical Exposure (ECE)

RMU – 12
Integrated Modular MBBS Curriculum 2026
Isolation to Beyond Boundaries



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 • Enlist causes of epigastric pain, • Gain insight into the various causes and presentations of this symptom.	• 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 • 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 • 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	• 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**
I Acute Abdomen	At the end of the session students will be able to • 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	Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit
II See cases of Intestinal Obstruction	By the end of the session, students will be able to • 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.	Bedside Teaching Duration 1 hour Conducted by senior faculty member of unit
III Observe cases Peritonitis	At the end of session, students will be able to • Explain the pathophysiology of peritonitis • Identify common causes of peritonitis, such as perforation of the gastrointestinal tract,	Bedside Teaching Duration 1 hour Conducted by senior faculty member of unit

	pancreatitis, and pelvic inflammatory disease	
IV Henias • Incisional Hernia • Inguinal Hernia	At the end of session, students will be able to • 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	Bedside Teaching Duration 1 hour Conducted by senior faculty member of unit

Rotation to Department of Radiology

Early Clinical Exposure Second Year MBBS		
Session	**Learning Objectives**	**Teaching Strategy**
I Ultrasound of Liver/ Ascites	At the end of the session students will be able to • 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.	Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit
II Plain X-Ray Abdomen/ Fluid level/ Air under diaphragm	At the end of the session students will be able to • Describe the indications for ordering a plain X-ray of the abdomen. • List the basic steps in interpreting these images.	SGD Duration 1 hrs Conducted by senior

	• Identify Fluid Levels and their clinical significance: • Recognize Air under the Diaphragm and its implications:	faculty member of unit
III Barium swallow/ Meal/Enema	By the end of the session, students will be able to • 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:	SGD Duration 1 hrs Conducted by senior faculty member of unit
IV CT Scan Abdomen	At the end of session, students will be able to • 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,	SGD Duration 1 hour Conducted by senior faculty member of unit

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 • 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 • Duration 1 hour • Conducted by senior faculty member of unit
II Dialysis	• 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 • Understand the basics and	

	significance of Kidney Transplantation • Familiarize with the Transplant Process • Appreciate the patient perspective and post-Transplant care.	SGD Duration 1 hrs Conducted by senior faculty member of unit

Rotation to Department of Radiology

Early Clinical Exposure Second Year MBBS		
Session	**Learning Objectives**	**Teaching Strategy**
I Ultrasound of Kidney	At the end of the session students will be able to • 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 thekidney , including its size, texture, and vascular structures.	Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit
II Plain X-Ray KUB	• 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	SGD Duration 1 hrs Conducted by senior faculty member of unit

	• 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)	• 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.	• 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	At the end of the session students will be able to • 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.	Bedside Teaching • 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**
I **Ovarian Tumors**	At the end of the session students will be able to • 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	Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

	effectively and empathetically with patients dealing with serious diagnoses.	
II **Uterine Tumors**	• 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**	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
	• 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	symptoms. • 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.	

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**	At the end of the session students will be able to • 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	Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

	information from pregnant patients, including history of substance use, domestic violence, and mental health concerns. • Emphasize the importance of building rapport, maintaining confidentiality, and providing nonjudgmental support during history-taking.	
II **Obstetrics** **Trimesters**	• 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,	Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit

	immunizations, and glucose screening for gestational diabetes. • 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.	
III **Fetal heart sounds**	• 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	Bedside Teaching • 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**	At the end of the session students will be able to • 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.	Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

II **Hydrocele**	• 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.	Bed side teaching • Duration 1 hour • Conducted by senior faculty member of unit
III **Undescended Testis**	• 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.	Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

	• 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**	• 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	Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

	associated with hypospadias/epispadias repair • Discuss the importance of long-term follow-up care.	

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	At the end of the session students will be able to • 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	• Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

II Paraplegia	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
III Vegetative state	• 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	• 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.	

Rotation to Department of Surgery/ Neurosurgery

Early Clinical Exposure Second Year MBBS CNS Module		
Session	**Learning Objectives**	**Teaching Strategy**
I Head injury	At the end of the session students will be able to • 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	• 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	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit

	• 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.	• Bedside teaching • Duration 1 hrs • Conducted by senior faculty member of unit

Rotation to Department of Radiology

Early Clinical Exposure Second Year MBBS CNS Module		
Session	**Learning Objectives**	**Teaching Strategy**
I **CT scan** **Brain** • **Normal** • **Stroke** • **Hemorrhage** • **Infarction**	At the end of the session students will be able to • 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	• Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

	preliminary diagnoses and understand potential management strategies. This objective aims to integrate their radiographic findings with clinical reasoning to enhance their diagnostic acumen.	
II Hydrocephalus	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit

III **Brain atrophy**	• 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.	• Bedside teaching • Duration 1 hrs • Conducted by senior faculty member of unit
	• Define brain edema • Distinguish between the two main types of brain edema: cytotoxic edema, which involves fluid	•Bedside teaching

IV **Brain Edema**	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.	•Duration 1 hrs •Conducted by senior faculty member of unit
V **Skull/ spine Fractures**	• 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	• Bedside teaching • Duration 1 hrs • Conducted by

	from skull fractures and spinal cord injury from spine fractures. They will examine how the location and severity of the fracture impact neurological outcomes. • 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.	senior faculty member of unit
VI **MRI Brain/ Spine**	• 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	• Bedside teaching • Duration 1 hrs Conducted by senior faculty member of unit

	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.	

Special Senses and Endocrinology Module
Rotation to Department of Medicine

Early Clinical Exposure Second Year MBBS Special senses and Endocrinology Module		
Session	**Learning Objectives**	**Teaching Strategy**
I **Thyroid disorders**	At the end of the session students will be able to • 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	• Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

	and procedures used to evaluate thyroid function, including TSH levels, T3 and T4 tests, ultrasound, and fine-needle aspiration biopsy. • Discuss the general management strategies for thyroid disorders, focusing on pharmacological treatments such as synthetic thyroid hormones and anti-thyroid medications.	
II **Hyperthyroidism**	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
III	• Describe the various causes of hypothyroidism, including autoimmune thyroiditis (such as Hashimoto's thyroiditis), iatrogenic factors, and iodine deficiency.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty

Hypothyroidism	• 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**	• 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.	•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**	At the end of the session students will be able to • 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.	• Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

II **Multi nodular Goiter**	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
III **CA Thyroid**	• 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	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit

	the use of ultrasound-guided fine needle aspiration biopsy, and the roles of other imaging modalities and laboratory tests. • 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	
IV **Graves Diseases**	• 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.	•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**	At the end of the session students will be able to • 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.	• Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit
II **Visual field defect**	• 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	

	pathway. • 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
III **Cataract**	• 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.	•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**	At the end of the session students will be able to • 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..	• Bedside Teaching • Duration 1 hour • Conducted by senior faculty member of unit

II **Hearing tests**	• 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.	• Bedside teaching • Duration 1 hour • Conducted by senior faculty member of unit
III **Nasal Obstruction**	• 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	•Bedside teaching •Duration 1 hour •Conducted by senior

	otoscope for visualization of the nasal passages.. • 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

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:_____

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Proforma For Early Clinical Exposure for Second Year MBBS

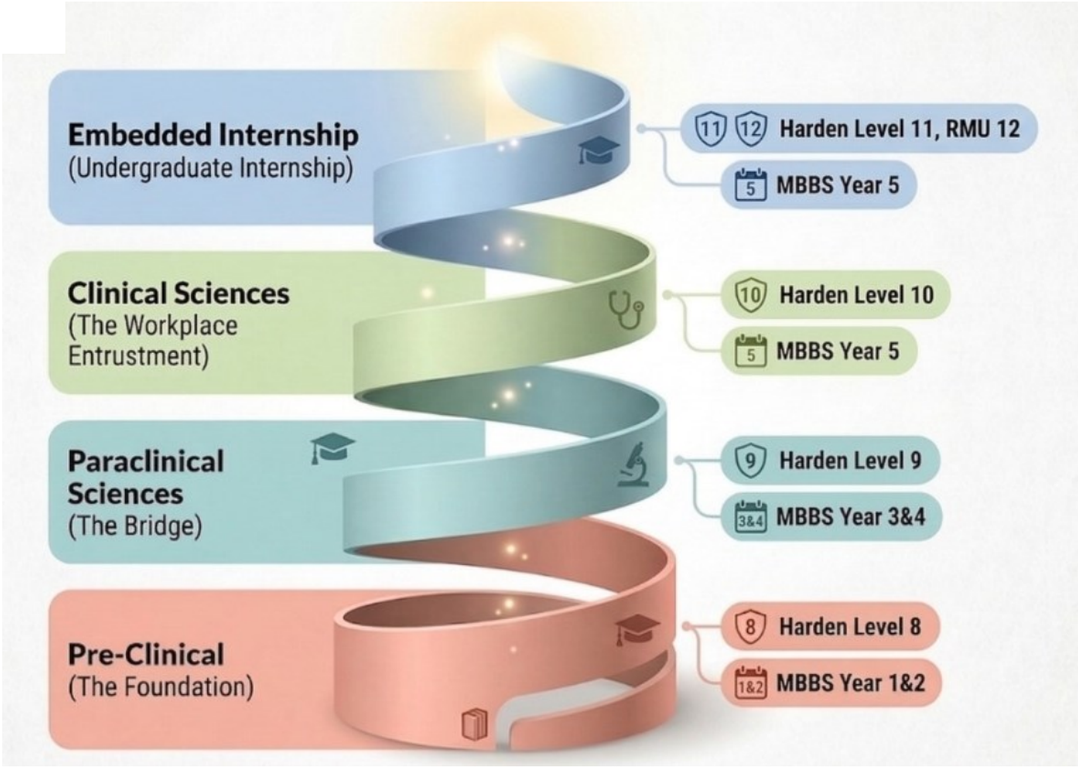
Roll Number: _____

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

SECTION – X

- Learning Resources

RMU – 12
Integrated Modular MBBS Curriculum 2026
Isolation to Beyond Boundaries



Learning Resources

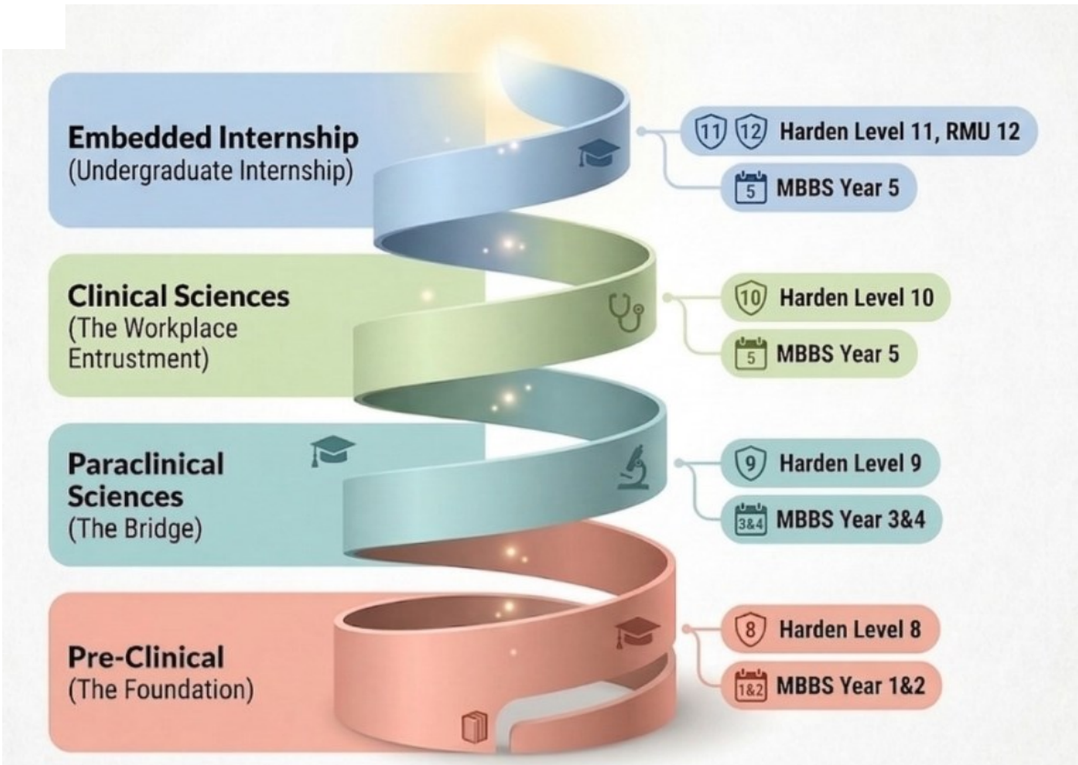
Subjects	Resources
Core Subjects & Horizontal Integration Subjects	
Anatomy	**Gross Anatomy** Gray's Anatomy by Prof. Susan Standring 42th edition, Elsevier. Clinical Anatomy for Medical Students by Richard S. Snell 10th edition. Clinically Oriented Anatomy by Keith Moore 9th edition. Cunningham's Manual 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 IIlustrated Reviews: Biochemistry – Wolters Kluwer Harper's Illustrated Biochemistry 32th edition. Lehninger Principle of Biochemistry 8th edition. Biochemistry by Devlin 7th edition.
Community Medicine	**Textbooks** Community Medicine by Parikh 25th edition. Community Medicine by M Illyas 8th edition. Basic Statistics for the Health Sciences by Jan W Kuzma 5th edition.
Pathology/Microbiology	**Textbooks** Robbins & Cotran, Pathologic Basis of Disease, 10th edition. Rapid Review Pathology, 5th edition by Edward F. Goljan MD. http://library.med.utah.edu/WebPath/webpath.html
Pharmacology	**Textbooks** 1. Lippincot Illustrated Pharmacology 9th edition.

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

SECTION – XI

- Assessments

RMU – 12
Integrated Modular MBBS Curriculum 2026
Isolation to Beyond Boundaries



RMU – 12 Assessment Framework of Integrated Modular MBBS Curriculum 2026

Isolation to **Beyond Boundaries**

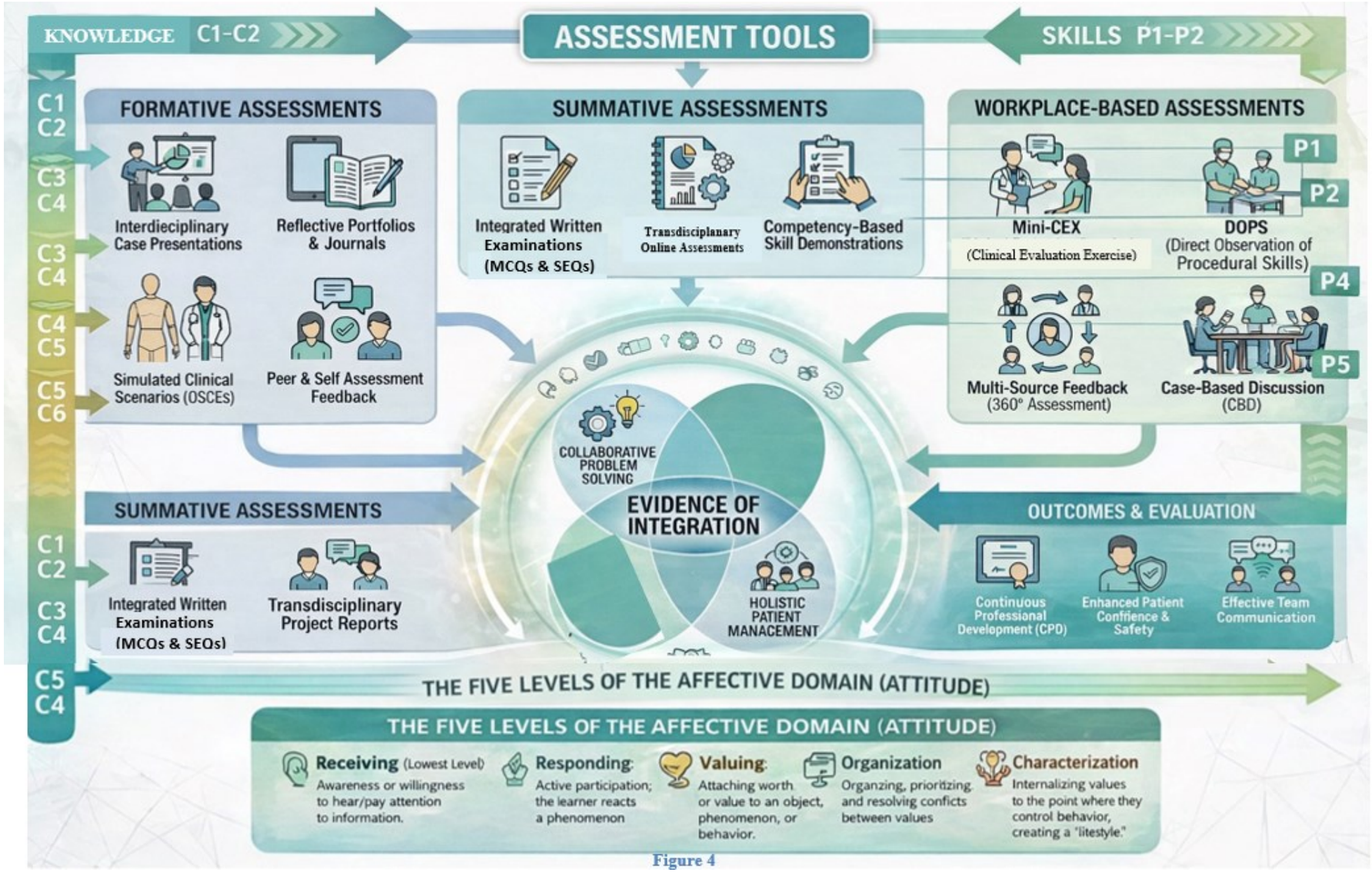


Figure 4

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 assessmentinstrument 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 andfaculty 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. Formative assessment is conducted at both mid-module and end-module stages for clinical lectures and joint multidisciplinary sessions. These assessments are carried out through an on-campus online assessment platform to monitor students' ongoing learning and progress.

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
- 85% 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 Assessmen tof 30 MCQs (10 MCQs per Subject)																																	

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

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

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

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

Marks per Item

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

OSPE Time=1 Round of 40 Students =80 min

3 Round of 40 Students =240 min

OSVE=Time per student=5mins

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.

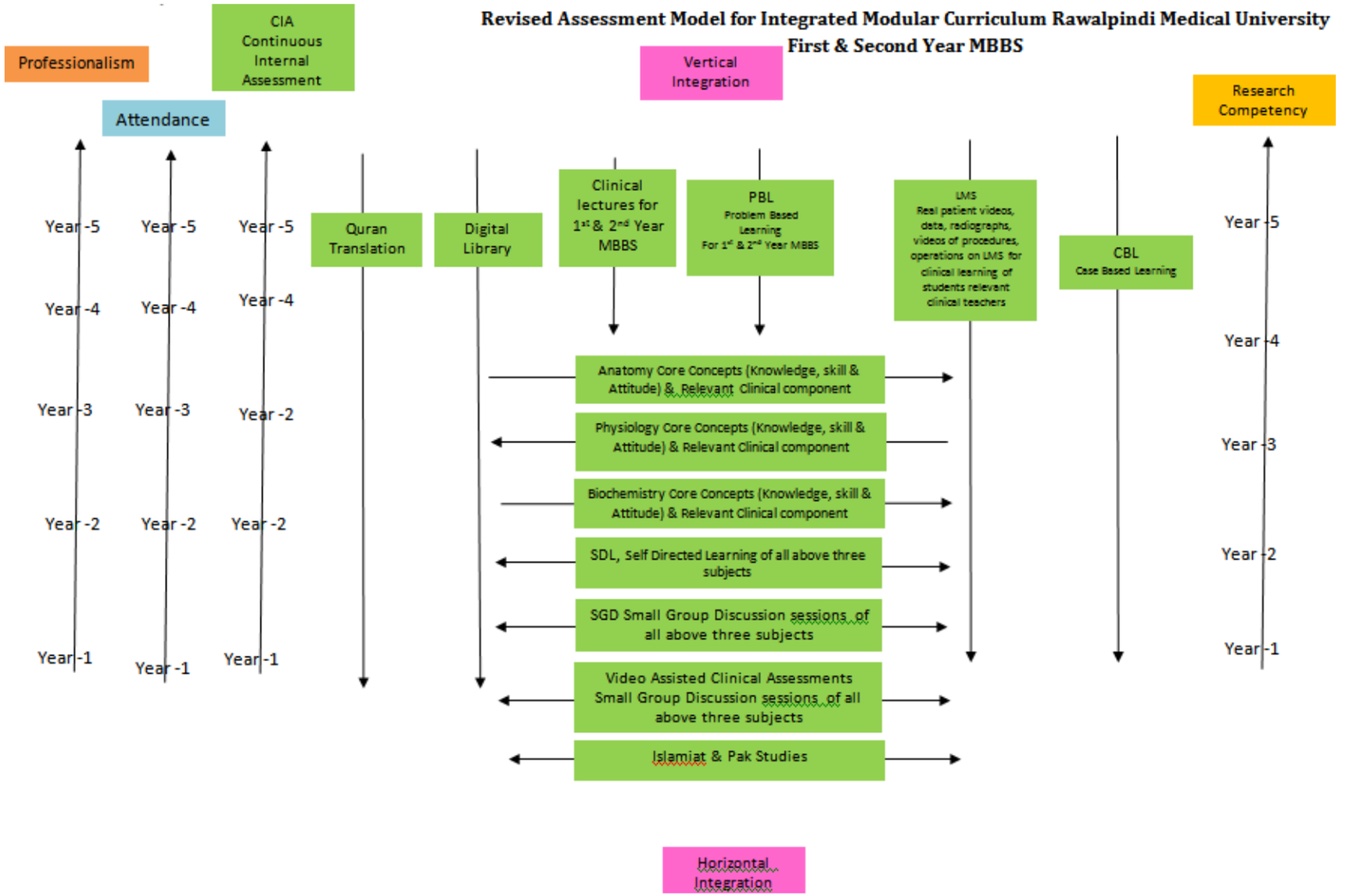
Break up of internal assessment is as follows:

Table 4: Block wise and subject wise distribution of CIA marks = 360Marks (40%)

Subjects	Block-I			Block-II			Block-III			Total CIA (40%)
	On campus assessments (30%)	Online LMS based Summative assessments (10%)	Total (40%)	On campus assessments (30%)	Online LMS based Summative assessments (10%)	Total (40%)	On campus assessments (30%)	Online LMS based Summative assessments (10%)	Total (40%)	
Anatomy	30	10	40	30	10	40	30	10	40	40+40+40=120
Physiology	30	10	40	30	10	40	30	10	40	40+40+40=120
Biochemistry	30	10	40	30	10	40	30	10	40	40+40+40=120
Total Marks of CIA	**90**	**30**	**120**	**90**	**30**	**120**	**90**	**30**	**120**	**120+120+120= 360**

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

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



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

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

Block	Sr. #	Module – 1 GIT Module - I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – IV	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 – 2 Renal Module-I 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 – IV 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- V):

Block	Sr. #	Module – 3 Reproduction Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – V	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-I 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 – V 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- VI):

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 – VI	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-IComponents**	**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 – VI 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 - I	2 Hours & 35 minutes	30 Minutes	**3 Hours & 05 Minutes**
Renal Module-I	2 Hours & 35 minutes	60 Minutes	**3 Hours & 35 Minutes**
Block -IV	**5 Hours & 30 Minutes**		**5 Hours & 30 Minutes**
Reproduction Module-I	2 Hours & 35 minutes	30 Minutes	**3 Hours & 05 Minutes**
CNS Module-I	2 Hours & 35 minutes	60 Minutes	**3 Hours & 35 Minutes**
Block -V	**5 Hours & 30 Minutes**		**5 Hours & 30 Minutes**
Special Senses Module	2 Hours & 35 minutes	30 Minutes	**3 Hours & 05 Minutes**
Endocrinology-I Module	2 Hours & 35 minutes	60 Minutes	**3 Hours & 35 Minutes**
Block -VI	**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 Physiology for Second Year MBBS (Block- IV):

Block	Sr. #	Module – 1 GIT Module - I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – IV	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-I 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 – IV 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- V)

Block	Sr. #	Module – 3 Reproduction Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – V	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-I 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 –V 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- VI):

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 – VI	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-I 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 – VI 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 - I	2 Hours & 35 minutes	30 Minutes	**3 Hours & 05 Minutes**
Renal Module-I	2 Hours & 35 minutes	60 Minutes	**3 Hours & 35 Minutes**
Block -IV	**5 Hours & 30 Minutes**		**5 Hours & 30 Minutes**
Reproduction Module-I	2 Hours & 35 minutes	30 Minutes	**3 Hours & 05 Minutes**
CNS Module-I	2 Hours & 35 minutes	60 Minutes	**3 Hours & 35 Minutes**
Block -V	**5 Hours & 30 Minutes**		**5 Hours & 30 Minutes**
Special Senses Module	2 Hours & 35 minutes	30 Minutes	**3 Hours & 05 Minutes**
Endocrinology-I Module	2 Hours & 35 minutes	60 Minutes	**3 Hours & 35 Minutes**
Block -VI	**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 Biochemistry for Second Year MBBS (Block- IV):

Block	Sr. #	Module – 1 GIT Module - I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – IV	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-I 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 – IV 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-V):

Block	Sr. #	Module – 3 Reproduction Module-I Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block – V	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-I 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 – V 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- VI):

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 – VI	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-I 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 – VI 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 - I	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Renal Module-I	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -IV	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Reproduction Module-I	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
CNS Module-I	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -V	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Special Senses Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Endocrinology-I Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -VI	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- IV):

Block	Sr. #	Module – 1 GIT Module - I Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
Block – IV	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-I 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- V):

Block	Sr. #	Module – 3 Reproduction Module-I Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
Block –V	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-I 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- VI):

Block	Sr. #	Module – 5 Special Senses Module Components	Type of Assessments	Total Assessments Time		No. of Assessments
				Assessment Time	Formative Assessment Time	
Block – VI	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-I 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 - I	45 Minutes	45 Minutes
Renal Module-I	45 Minutes	45 Minutes
Block -IV		
Reproduction Module-I	45 Minutes	45 Minutes
CNS Module-I	45 Minutes	45 Minutes
Block -V		
Special Senses Module	45 Minutes	45 Minutes
Endocrinology - I Module	45 Minutes	45 Minutes
Block -VI		
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 2025

- 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 Opthalmology Otorhinolaryngology	14 %	115 Marks
	Early Clinical Exposure (ECE)	1%	5 Marks
	ALPHA(Artificial Intelligence, Leadership, Professionalism, Humanities & Arts) GEC (General Education Cluster)	1%	5 Marks
	Total Marks		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 IV Marks	BLOCK V Marks	BLOCK VI Marks	Total Marks
845 Marks	285 Marks	285 Marks	275 Marks	845 Marks

B - Subject wise marks breakup in Blocks

Subjects	Block IV	Block V	Block VI	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 -IV

Block	Subjects	Theory (Knowledge)	Practical (Skill/attitude)	Total marks	Total marks (Core subjects + Integrated Subjects)
Block IV	Anatomy	50	30	80 marks	240+ 45 = 285 marks
	Physiology	50	30	80 marks	
	Biochemistry	50	30	80 marks	

(Core subjects + Integrated Subjects) 285 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			
	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 marks		240+ 45 = 285 marks			

D - Subject wise Break up of Marks for Second year MBBS - Block -V

Block	**Subjects**	**Theory (Knowledge)**	**Practical (Skill/attitude)**	**Total marks**	**Total marks (Core subjects + Integrated Subjects)**
Block V (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				

285 Marks	Community Medicine /Research	4 Marks		45 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 marks		240+ 45 = 285 marks			

E - Subject wise Break up of Marks for Second year MBBS - Block -VI

Block	**Subjects**	**Theory (Knowledge)**	**Practical (Skill/attitude)**	**Total marks**	**Total marks (Core subjects + Integrated Subjects)**
Block VI	Anatomy	50	30	80 marks	
	Physiology	50	30	80 marks	
Total marks (Core subjects + Integrated Subjects)	Biochemistry	50	30	80 marks	
	Total			240 marks	240+35 = 275 marks
	Integrated Subjects			35 Marks	
	Community Medicine	2 Marks			
	Behavioural Sciences	2Marks			
	Medicine	3 Marks			
	Family medicine	3 Marks			
275 Marks	Gynae & Obs	2 Marks			
	Radiology	2 Marks			

	Pediatrics	2 Marks			
	Otorhinolaryngology	3 Marks			
	Opthalmology	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 - I) & Module 2(Renal Module-I) - Block -IV

Block -IV 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 -IV 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-I) & Module 4(CNS Module-I) - Block -V

Block -V 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 -V 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 -VI

Block -VI 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 -VI 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 2025

Block -IV	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 -V	Theory component (Knowledge)	Practical component (Skill & Attitude)	

	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	Total time required for Block – II pre-annual assessment is 8 hrs and 25 minutes
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 -VI	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 -IV	Block -IV
Paper-2	Block- V	Block- V
Paper-3	Block-VI	Block-VI
Paper-4	-------	GEC (Islamic Studies C Pakistan Studies)

a. **Second Professional Examination Total Marks = G00***
   i. Block I Assessment Total Marks = 300
   ii. Block II Assessment Total Marks = 300
   iii. Block III Assessment Total Marks = 300
b. **Second Professional Examination- 1000 Marks***
   i. Block I Assessment Total Marks = 300

ii. Block II Assessment Total Marks = 300

iii. Block III Assessment Total Marks = 300

iv. GEC Assessment (Islamic Studies C Pakistan Studies) Total Marks = 100

*Marks Adopted from University of Health Sciences (UHS)

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

- **Continuous Internal Assessment (CIA):**

Continuous Internal Assessment shall carry total marks = 270 (30% of the total allocated marks= 900) for 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 -IV	75	6
Block -V	75	6
Block -VI	75	6
Second Year MBBS	**Number of MCQs**	**Number of SEQs**
Block -IV	70	7
Block -V	75	6
Block -VI	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 carries15 marks.

Second year MBBS	**Number of LabOSPE Stations**	**Number of iOSPE Stations**	**Number of OSCE Stations**	**Number of tables VIVA**
Block -IV	5	3	4	3
Block -V	5	3	4	3
Block -VI	4	3	5	3
Second Year MBBS	**Number of LabOSPE Stations**	**Number of iOSPE Stations**	**Number of OSCE Stations**	**Number of tables VIVA**
Block -IV	4	3	5	3
Block -V	5	3	4	3
Block -VI	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 C Biochemistry).

- **Supplementary Examination Criteria:** The student who fails in any component of a block assessment will have to appear in the supplementary examination of the entire block.

Table of Abbreviation

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

Annual Assessment Plan of Second Year MBBS 2025 (Batch 52)

- 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 IV 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 V 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	
BlockVI 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**

B: Extrapolated marks to be calculated from Summative assessments throughout the Academic Year 2025

Blocks	Modules	Anatomy	Physiology	Biochemistry	Total
Block IV 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**
	Module 1	200	200	200	600

BlockV 1470 Marks	Module 2	200	200	200	600
	Block Exam	90	90	90	270
	Total	**490**	**490**	**490**	**1470**
Block VI 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 2025

- 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 • Community Medicine C Public Health/Research • Behavioural Sciences • Pathology • Pharmacology • Radiology • Family Medicine • Surgery • Medicine • Gynae C Obs • Orthopedics • Pediatrics • Surgery • Opthalmology • Otorhinolaryngology	11%	73 Marks

• Early Clinical Exposure • ALPHA and General Education Cluster (GEC)	2%	10 Marks
Total Marks		**630 Marks**

B: Blockwise Distribution of Marks

Total Annual Professional Marks (70%)	**BLOCK IV Marks**	**BLOCK V Marks**	**BLOCK VI 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 IV**	**Block V**	**Block VI**	**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
Block IV 210 Marks	Anatomy	45 marks	40 marks	85 marks	183+27 = 210 marks
	Physiology	20 marks	25 marks	45 marks	
	Biochemistry	23 marks	30 marks	53 marks	
	Total	88	95	**183 marks**	
	Integrated Subjects			27 Marks	
	• Community Medicine/Research	4 Marks			
	• Behavioural Sciences	2 Marks			
	• Pathology	2 Marks			
	• Pharmacology	3 Marks			
	• Radiology	1 Marks			
	• Gynae C Obs	1 Marks			
	• Medicine	1 Marks			
	• Family Medicine	1 Marks			
	• Paediatrics	1 Marks			
	• Surgery	1 Marks			
	• ECE		5 Marks		
	• ALPHA and GEC		5 Marks		
Total marks		**183+27 = 210 marks**			

Block	Subjects	Theory	Practical	Total marks	Total marks Core Subject + Integrated Subjects
Block V	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				

210 Marks	• Community Medicine /Research	4 Marks		**29 Marks**	
	• Family Medicine	1 Marks			
	• Orthopedics	2 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**
Block VI	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			
210 Marks	• Otorhinolaryngology	1 Marks			
	• Opthalmology	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 52) (Annual Professional Marks + CIA)

Subject	**Theory**			**Practical**			**Total Marks**
	Component	**No of Items**	**Marks**	**Component**	**No of Items**	**Marks**	
Block IV (GIT / Renal) Total Annual marks=210	Section I- MCQ Section II- SEQ 6	75	75 30	LabOSPE iOSPE OSCE OSVE	5 3 4 3	25 15 20 45	210
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 V (Reproduction, CNS) Total Annual marks=210	Section I- MCQ Section II- SEQ 6	75	75 30	LabOSPE iOSPE OSCE OSVE	5 3 4 3	25 15 20 45	210
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 VI (Special Senses, Endocrinology) Total Annual	Section I- MCQ Section II- 6	75	75 30	LabOSPE iOSPE OSCE	4 3 5	20 15 25	210

marks=210	SEQ			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: 2nd Professional Examination 2025 (Batch 52)

Block IV Assessment Breakup (GIT, Renal Module-I)

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 iOSPE (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	Community 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	
	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: 2nd Professional Examination 2025 (Batch 52)

Block V Assessment

Reproduction, CNS Module-I

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**	**%**
Cores 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: 2nd Professional Examination 2025 (Batch 52)
Block VI Assessment
Special Senses, Endocrinology Modules

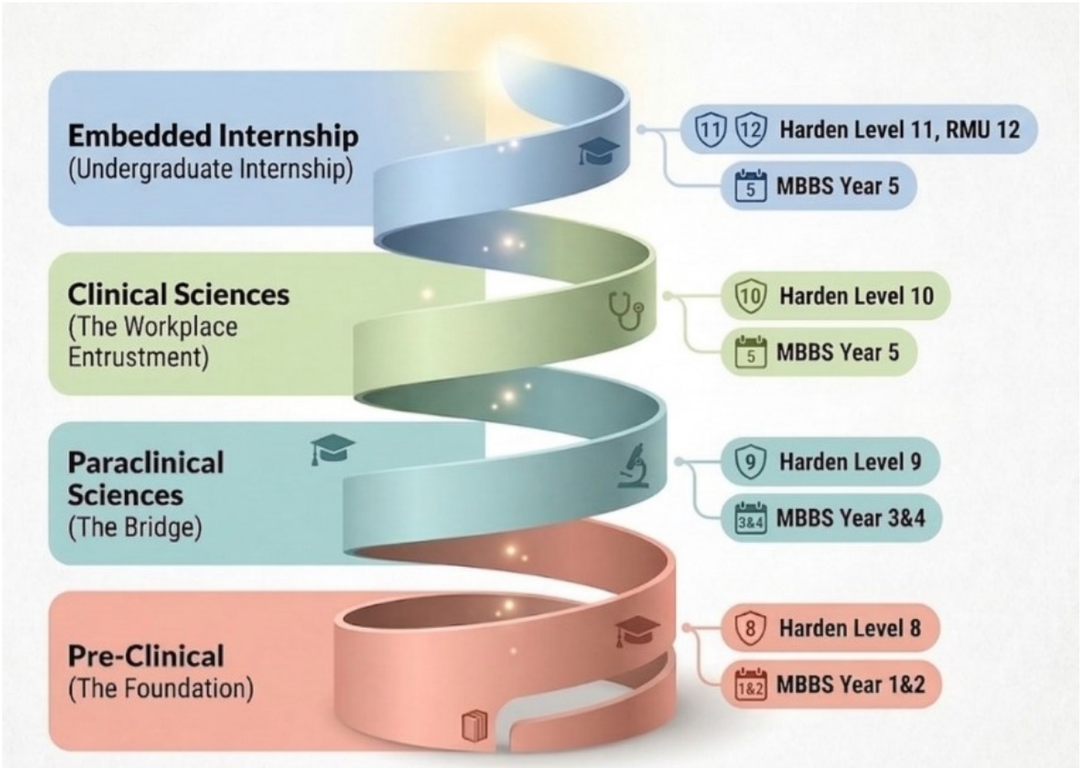
Themes	**Discipline**	**Theory**			**Practical**			**OSVE**		**Total Marks per subject**	
		No of MC Qs (1 marks each)	**No of SEQs (5 marks each)**	**Marks**	**No of Stations of LabOSPE (5 marks each)**	**No of Stations of iOSPE (5 marks each)**	**No of Stations of OSCE (5 marks each)**	**OSVE (15 Marks)**	**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	
	Opthalmology	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

- Feedbacks & Evaluation

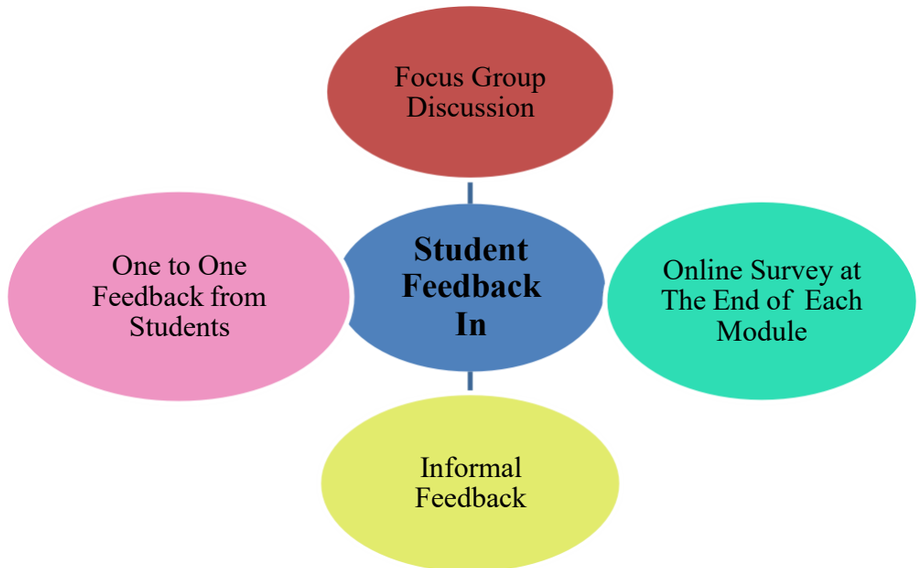
RMU – 12
Integrated Modular MBBS Curriculum 2026
Isolation to Beyond Boundaries



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 wasavailable.					
The module workload was manageable.					
The pace of the module was manageable.					
The module was well organized.					
Module started and ended on time.					
End of block feedback was taken					

Learning Environment and Teaching Methods

Questionnaire	Strongly Agree	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	StronglyDisagree
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.					

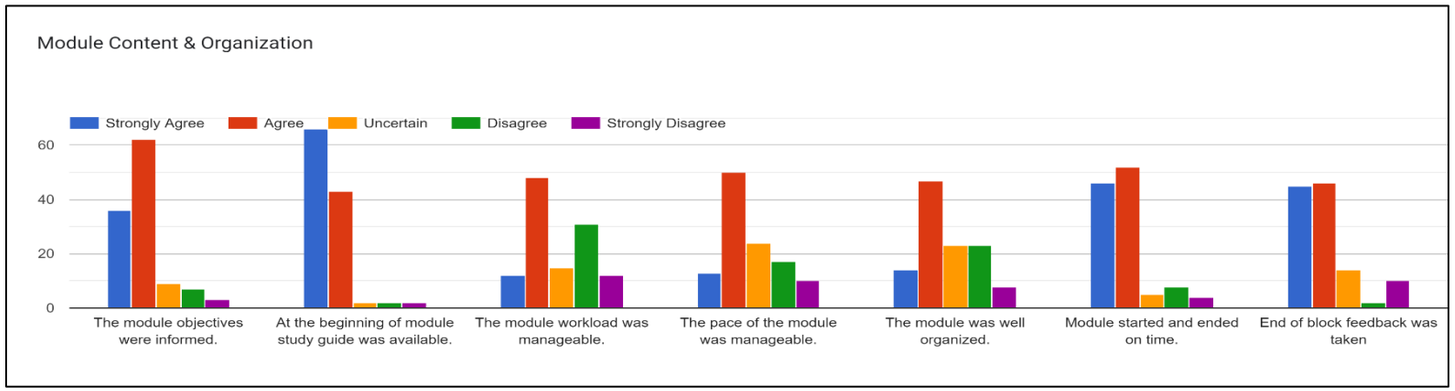
Assessments

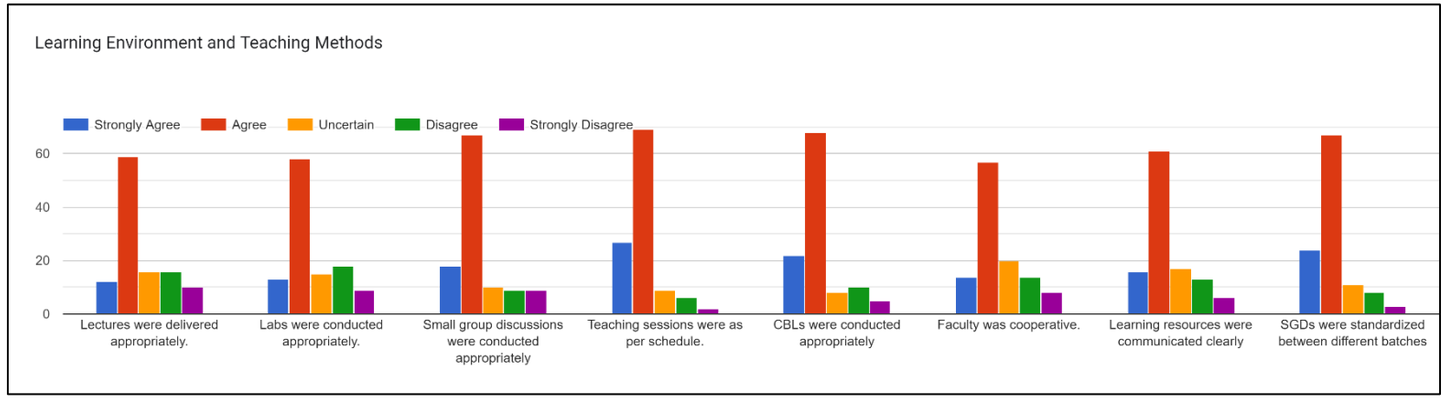
Questionnaire	Strongly Agree	Agree	Uncertain	Disagree	StronglyDisagree
Class tests were conducted regularly.					
Class tests were helpful					
Test difficulty was appropriate.					
Written Assessment was as per Table ofSpecifications.					
OSPE Exam was as per Table ofSpecification					
Table of Specification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

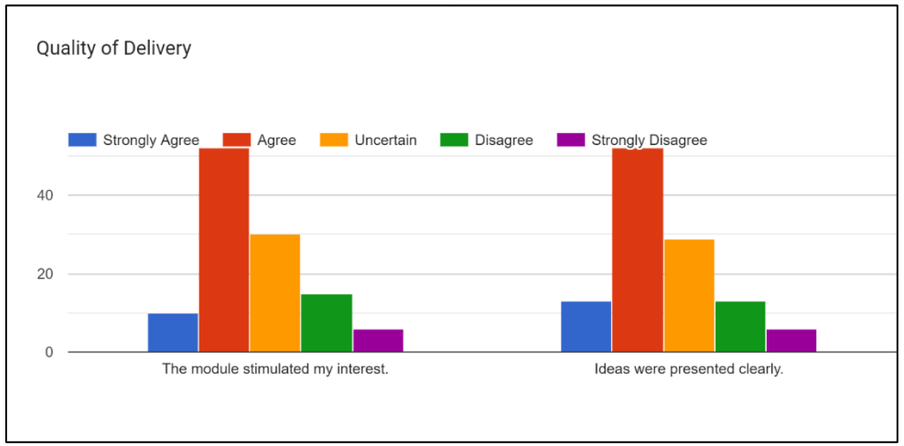
LMS and its working

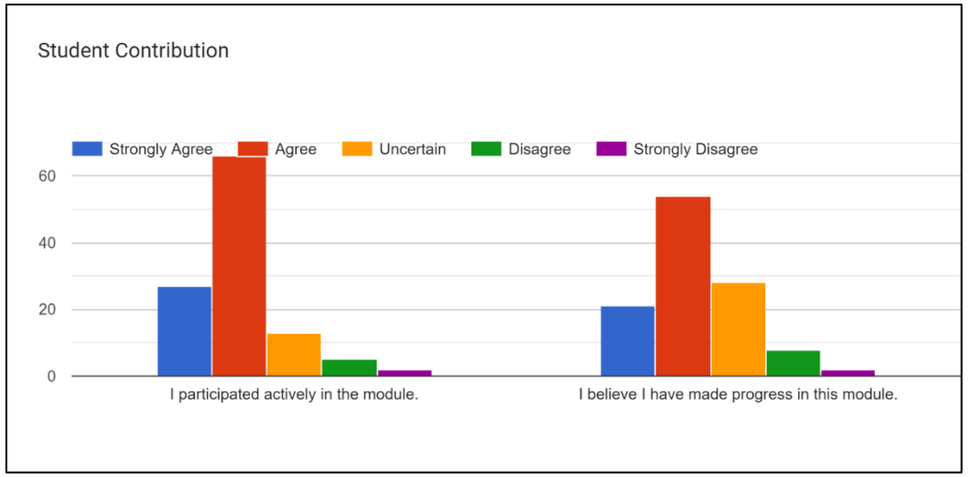
Questionnaire	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
Easy Access to LMS					
Module Content was Available					

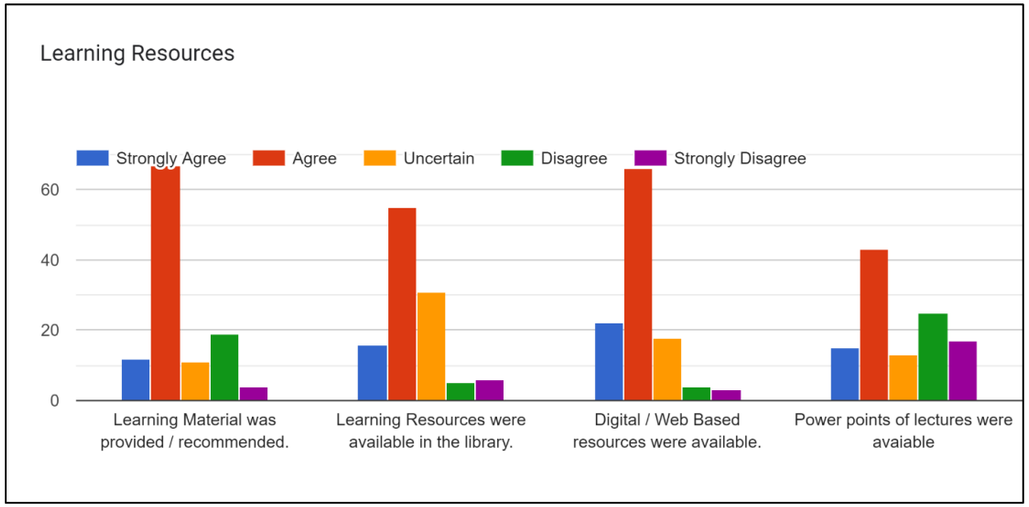
Student Feedback Report

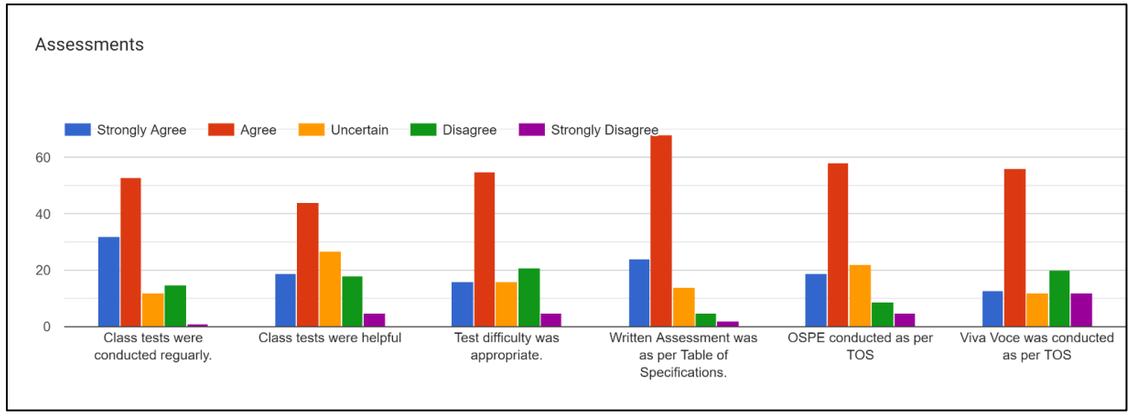


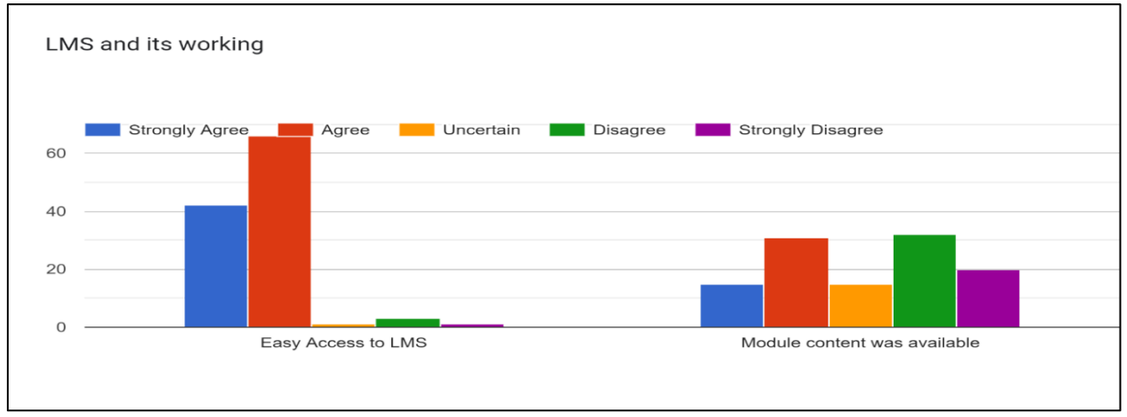







Learning Resources
Strongly Agree
Agree
Uncertain
Disagree
Strongly Disagree
60
40
20
0
Learning Material was provided / recommended.
Learning Resources were available in the library.
Digital / Web Based resources were available.
Power points of lectures were avaiable

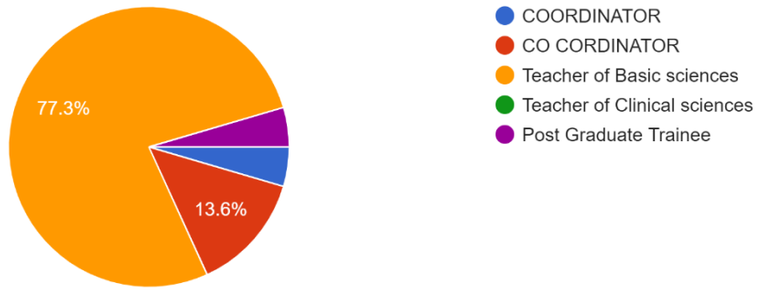

Assessments
Strongly Agree
Agree
Uncertain
Disagree
Strongly Disagree
60
40
20
0
Class tests were conducted reguarly.
Class tests were helpful
Test difficulty was appropriate.
Written Assessment was as per Table of Specifications.
OSPE conducted as per TOS
Viva Voce was conducted as per TOS


LMS and its working
Strongly Agree
Agree
Uncertain
Disagree
Strongly Disagree
60
40
20
0
Easy Access to LMS
Module content was available

Faculty Feedback Report

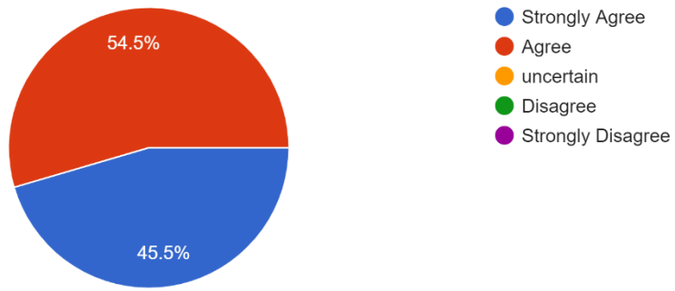
Role In Module

22 responses



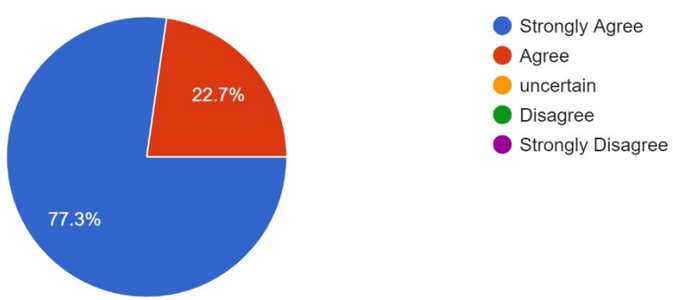
Timetable was timely conveyed to faculty

22 responses



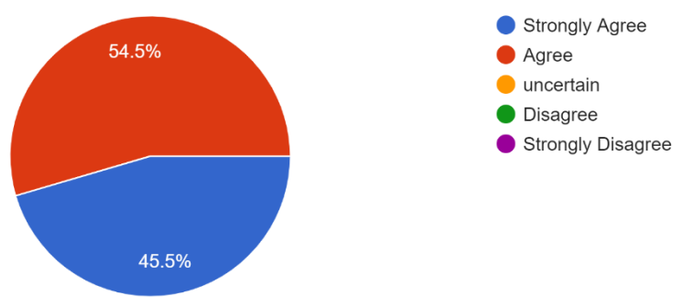
Study Guide was available

22 responses



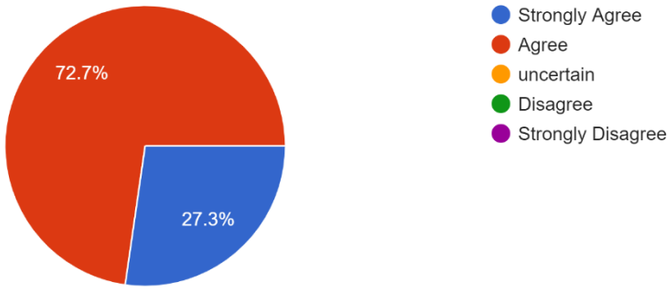
All the module objectives were covered

22 responses



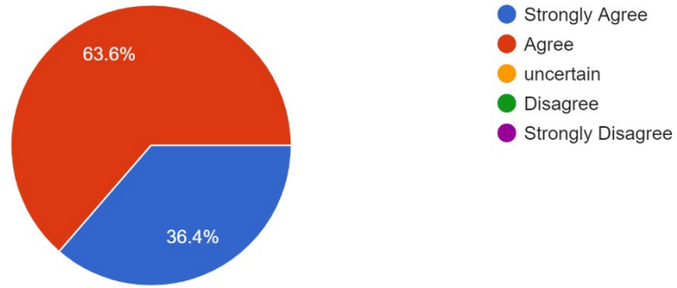
The module duration was appropriate

22 responses



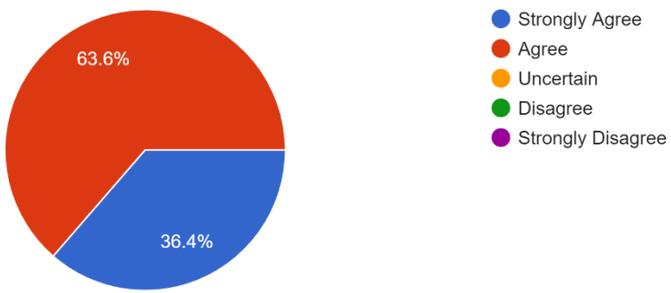
The module started and ended on time

22 responses



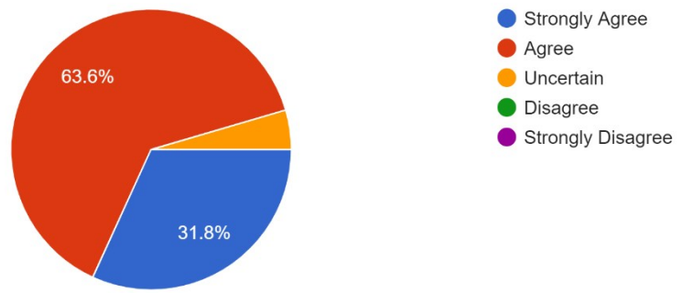
Teaching sessions were as per schedule

22 responses



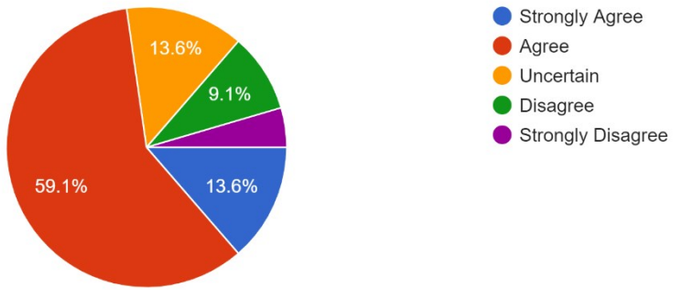
Faculty was cooperative

22 responses



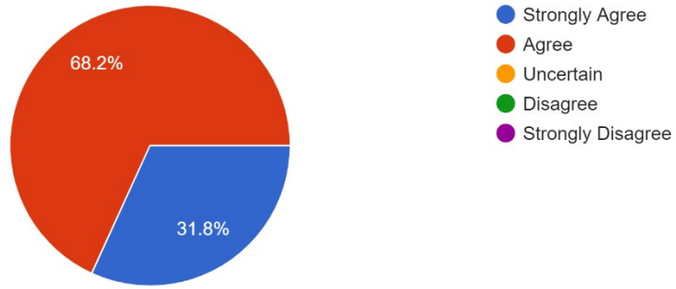
Workload was manageable

22 responses



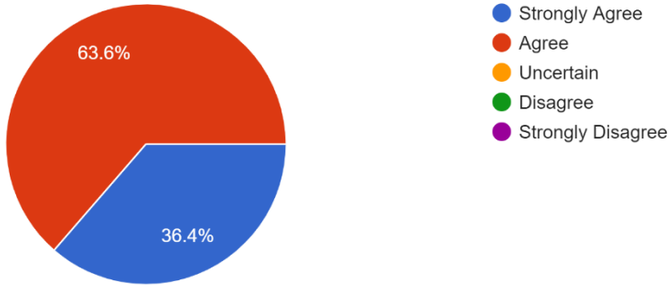
Lectures were conducted appropriately

22 responses



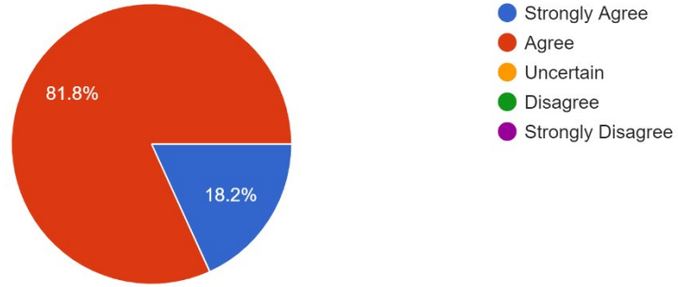
Practicals were conducted appropriately

22 responses



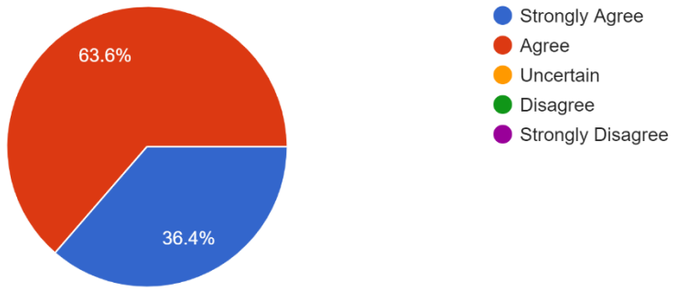
Small Group Discussion (including PBLs) were conducted appropriately

22 responses



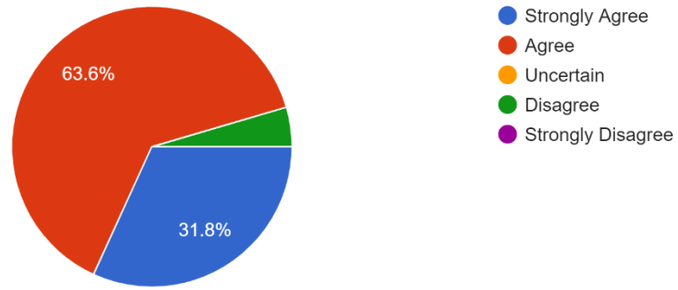
LMS & clinical evaluation were conducted regularly

22 responses



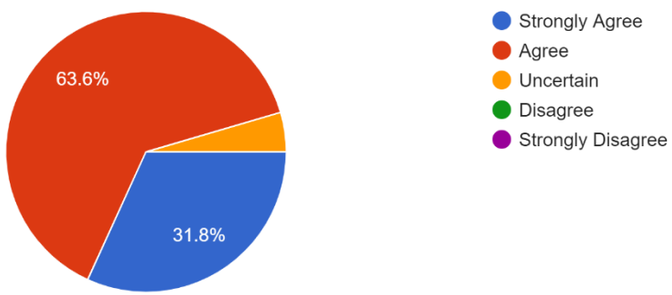
Module / Block exam was conducted as per schedule

22 responses



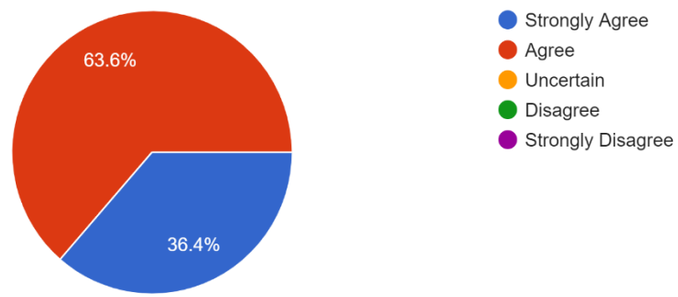
Written assessment was as per Table of Specifications

22 responses



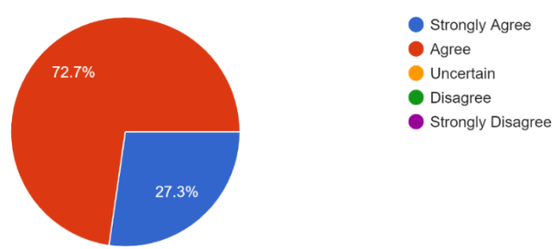
Practical assessment was as per Table of Specifications

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 5th 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**

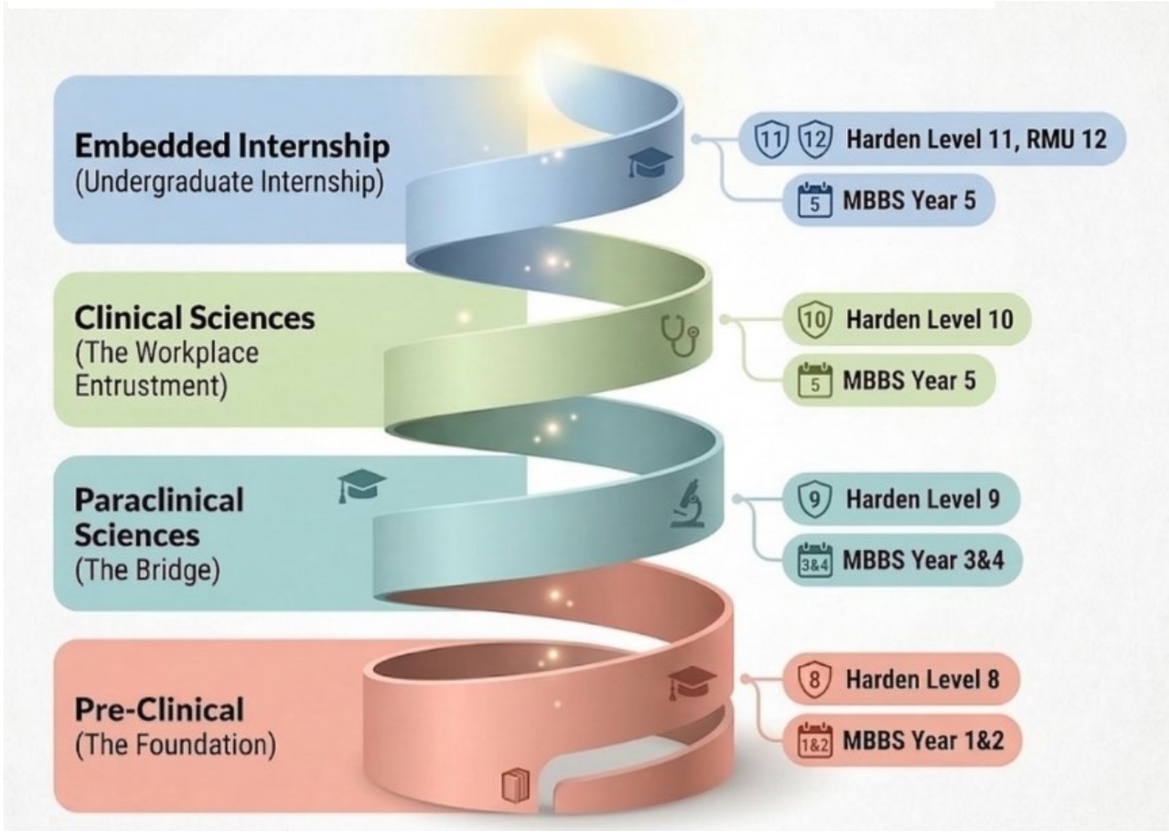
- We plan on taking the curriculum to excellence and improving the ladder of curriculum according to Harden's ladder of curriculum

➢ **Study Guides (Annexure-I)**

RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries





RMU – 12

Integrated Modular

MBBS Curriculum 2026

Isolation to Beyond Boundaries

Study Guide

Gastrointestinal Module-I

Department of Medical Education

2026

Second Year MBBS



RMU – 12

Integrated Modular

MBBS Curriculum 2026

Isolation to Beyond Boundaries

Study Guide

Renal Module-I

Department of Medical Education

2026

Second Year MBBS



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Integrated Modular

MBBS Curriculum 2026

Isolation to Beyond Boundaries

Study Guide

Reproduction Module-I

Department of Medical Education

2026

Second Year MBBS

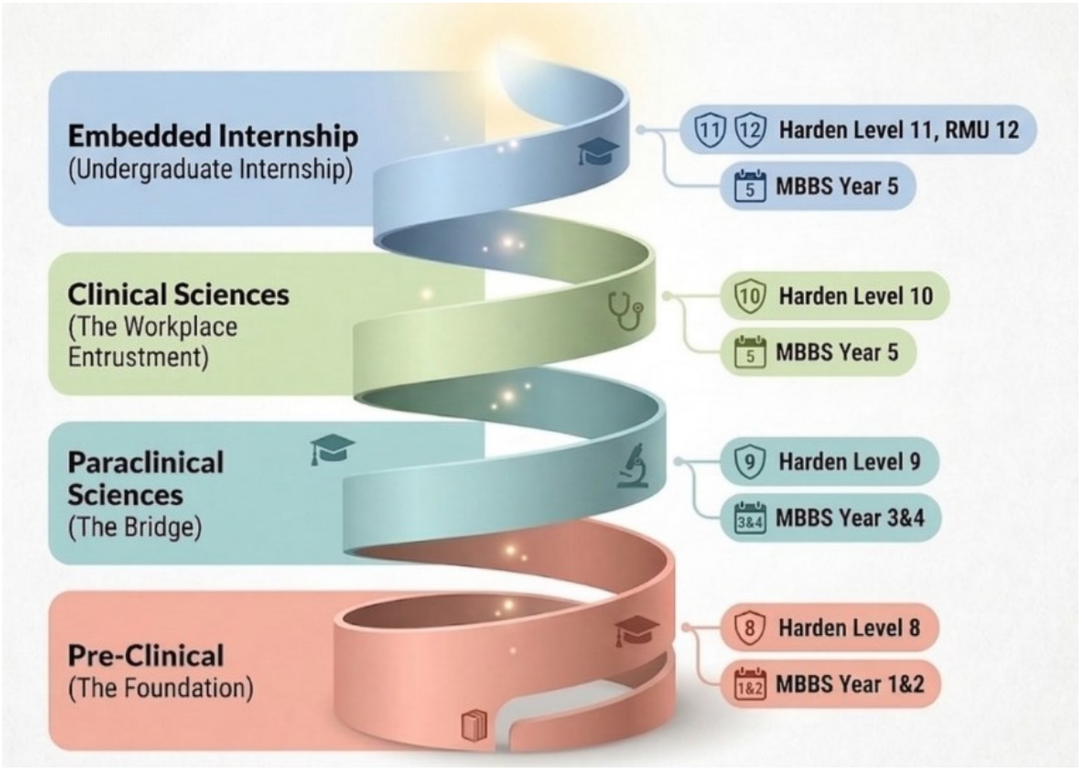
➢ **Spiral Curriculum**

(Annexure-II)

RMU – 12

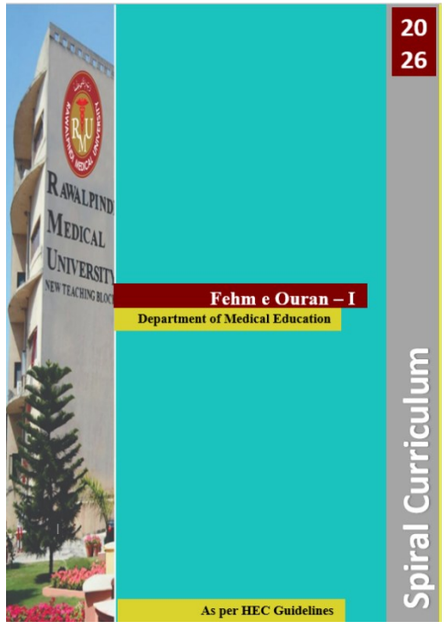
Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries



Preamble of Spiral Curriculums

Fehme-e-Quran-I

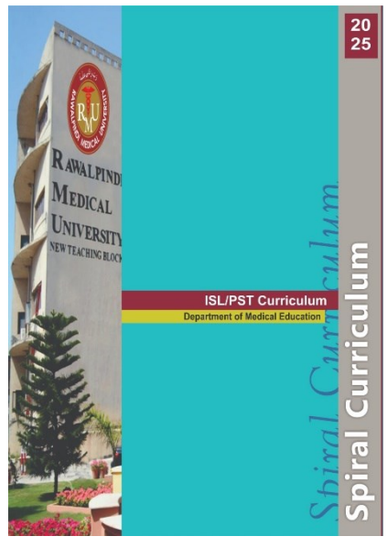


Preamble:

In pursuance of the directives issued by the Higher Education Commission of Pakistan and in line with national educational reforms aimed at strengthening value-based education in higher learning institutions, courses on Understanding of the Holy Quran (Fehm-e-Quran) have been introduced as a compulsory component of undergraduate and graduate degree programs at RMU across Pakistan.

In compliance with these national guidelines, Rawalpindi Medical University has incorporated Fehm-e-Quran I and Fehm-e-Quran II into its academic programs .The university is committed to ensuring the effective implementation of these courses through appropriate curriculum integration, faculty training, and academic oversight, thereby promoting the ethical, moral, and spiritual development of its students.

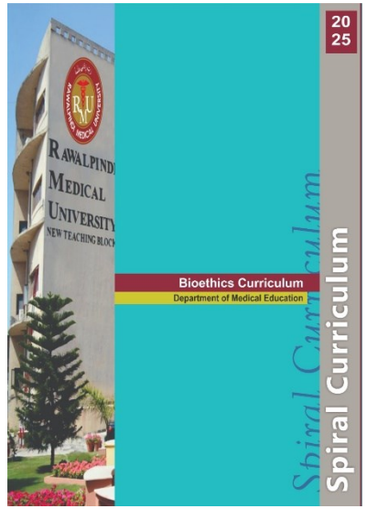
The Islamiyat & Pak Studies



Preamble:

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

Bioethics & Professionalism

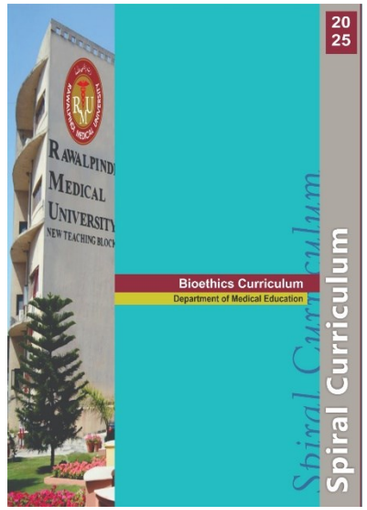


Preamble:

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

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

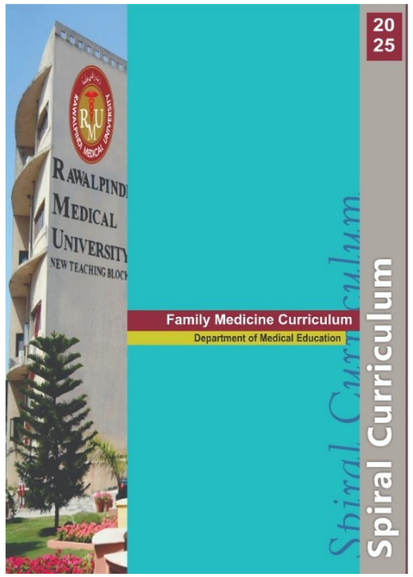
Integrated Undergraduate Research Curriculum (IUGRC)



Preamble:

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

Family Medicine



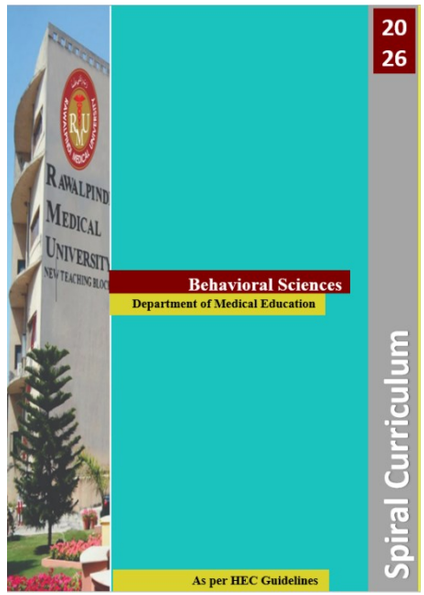
Preamble:

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.

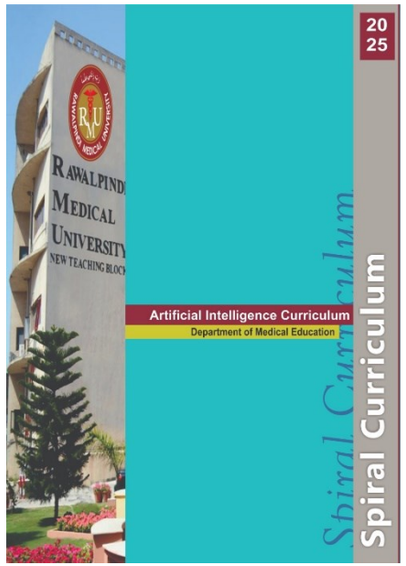
Behavioral Sciences



Preamble:

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.

Artificial Intelligence



Preamble:

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.

Entrepreneurship



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Preamble:

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.

Early Clinical Exposure (ECE)



Preamble:

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

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

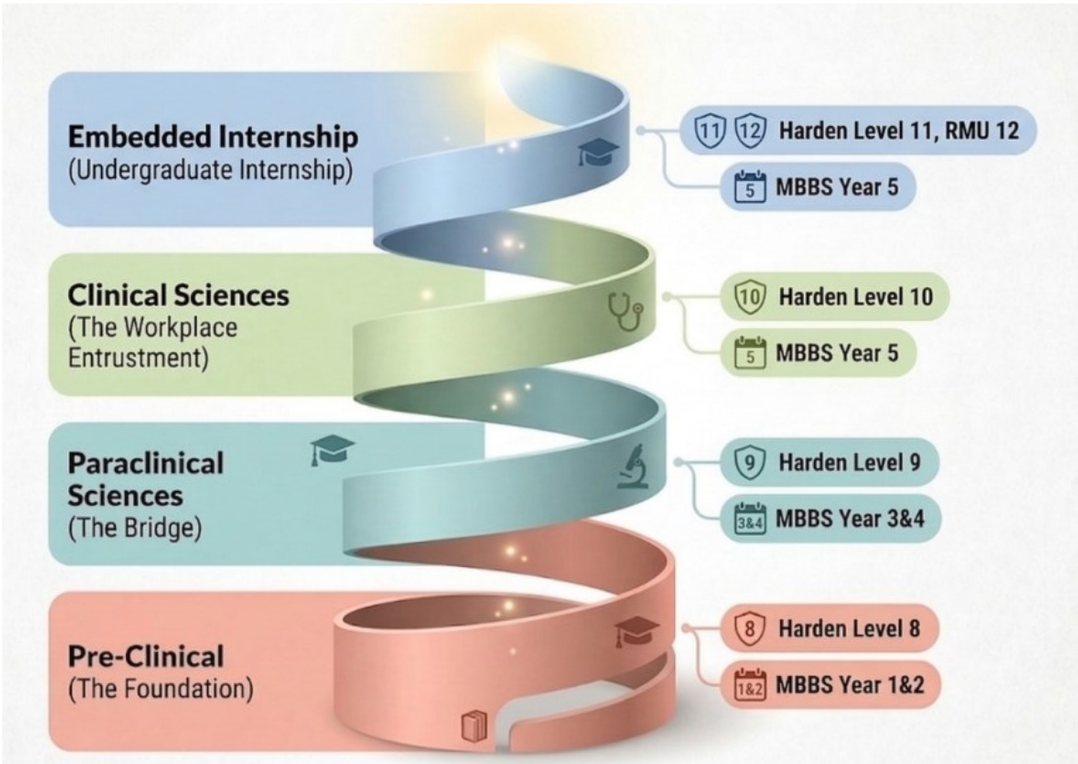
In summary, early clinical exposure in medical education is pivotal for the holistic development of medical students, providing them with a strong foundation of practical skills, professional attitudes, and a deep understanding of patient-centered care.

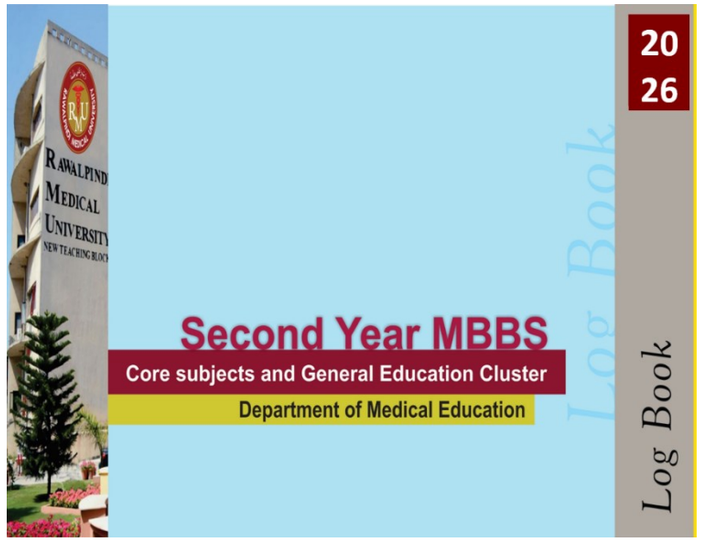
- **Log Books (Annexure-III)**

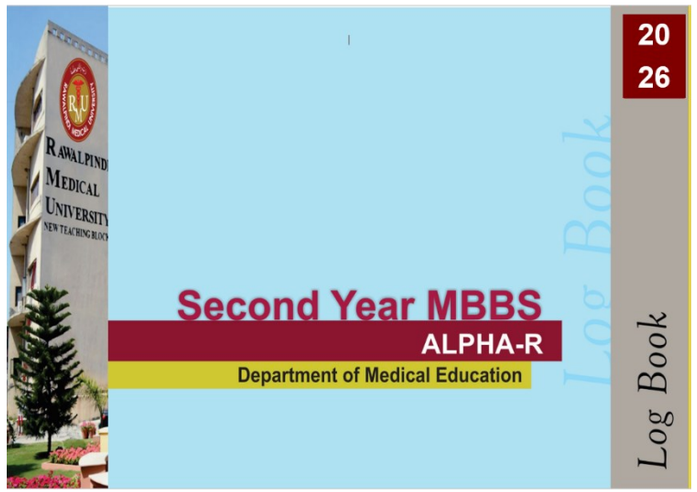
RMU – 12

Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries




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Core subjects and General Education Cluster
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