



RMU – 12

Integrated Modular

MBBS Curriculum 2026

Isolation to **Beyond Boundaries**

Study Guide

Central Nervous System Module-I

Department of Medical Education

**2
0
2
6**

Second Year MBBS

	Rawalpindi Medical University			
	Doc. Title: Procedure for Control of Documented Information			
	Document #: RMU-MR-SOP-59	Rev. #: 06	Issue #: 01	Issue Date: 09-06-2026

Procedure for Control of Documented Information

In-Compliance with

ISO 9001:2015

Clause 7.5

Copyright

The copyright of this procedure, together with all confidential information contained herein is the sole property of Rawalpindi Medical University

It may be copied in full or in parts only by the Management/personnel and only for Company-related activities. Disclosure of any information contained within this procedure to any person (s) outside the employee of the institute without written permission of the Vice Chancellor or Principal or ISO Committee Head is strictly prohibited.

	Rawalpindi Medical University			
	Doc. Title: Procedure for Control of Documented Information			
	Document #: RMU-MR-SOP-59	Rev. #: 06	Issue #: 01	Issue Date: 09-06-2026

Document Information

Category	CNS Module-I Study Guide
Document	Procedure for Control of Documented Information
Issue	1
Rev	06
Identifier	RMU-MR-SOP-59
Status	Final Document
Author(s)	Director Medical Education, Asst. Director Medical Education,
Reviewer(s)	Curriculum Committee.
Approver(s)	Vice Chancellor
Creation Date	09-06-2026
Effective Date	09-06-2026
Control Status	Controlled
Distribution	VC, Principal, ISO Committee
Disclaimer	This document contains confidential information. Do not distribute this document without prior approval from higher management of Rawalpindi Medical University .

	Rawalpindi Medical University			
	Doc. Title: Procedure for Control of Documented Information			
	Document #: RMU-MR-SOP-59	Rev. #: 06	Issue #: 01	Issue Date: 09-06-2026

Document Approval

Prepared By	Reviewed By	Approved By
Director Medical Education, Asst. Director Medical Education,	Curriculum Committee	Vice Chancellor

	Rawalpindi Medical University			
	Doc. Title: Procedure for Control of Documented Information			
	Document #: RMU-MR-SOP-59	Rev. #: 06	Issue #: 01	Issue Date: 09-06-2026

Document Revision History

Author(s)	Date	Version	Description
Prof Naeem Akhtar, Dr Ifra Saeed, Dr. Ayesha Yousaf, Dr Sidra Hamid, & Dr Tehmina Qamar	2017 - 2018	1 st	Developed for Second Year MBBS. Composed of Horizontally and Vertically CNS Module - I.
Dr Tehzeeb, Dr Samia Sarwar, Dr Ifra Saeed, Dr. Ayesha Yousaf, Dr Tehmina Qamar, & Dr Sidra Hamid	2019-2020	2 nd	Developed for Second 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	3 rd	Developed for Second 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	4 th	Developed for Second 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	5 th	Developed for Second 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	6 th	Developed for Second 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	7 th	Theme based curriculum developed for Second 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
--	-----------	-----------------	---

	Rawalpindi Medical University			
	Doc. Title: Procedure for Control of Documented Information			
	Document #: RMU-MR-SOP-59	Rev. #: 00	Issue #: 01	Issue Date: 09-06-2026

List of Copy Holders

Document Code	Issue # /Rev.#	Copy #	Copy Holders	Distribution Mode	Signature
RMU-MR-SOP-59	01/06	01	V.C	Email	
RMU-MR-SOP-59	01/06	02	HODs	Email	
RMU-MR-SOP-59	01/06	03	IC	Hard Copy	

SECTION – I

RMU – 12 Integrated Modular MBBS Curriculum 2026

Isolation to *Beyond Boundaries*

Preamble

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.

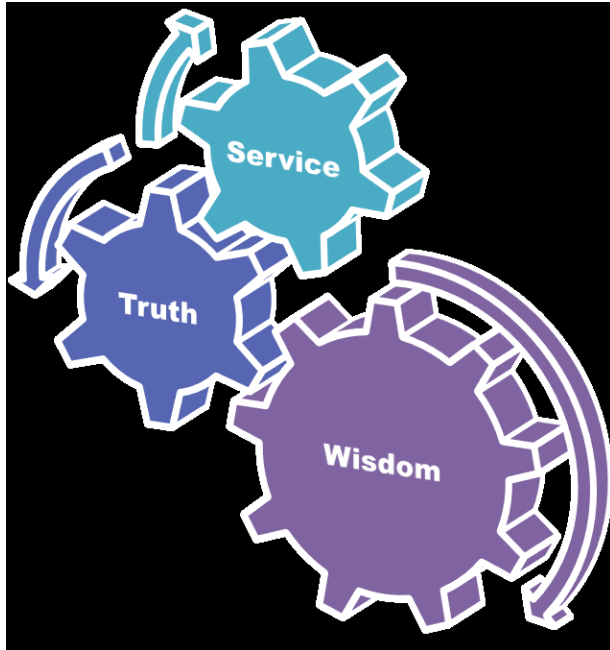
The Clinically Oriented Integrated Modular Curriculum transcends traditional disciplinary silos by promoting horizontal and vertical integration across basic, para-clinical, and clinical sciences. Learning experiences are contextualized around clinical problems and patient-centered care, fostering early 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.

University Moto, Vision, Values & Goals

RMU – 12



Vision and Values

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

Mission Statement

To deliver evidence-based, research oriented, and clinically integrated health professional education that produces practice-ready graduates capable of providing safe, effective, patient-centered care, while upholding the values of mutual respect, ethical medical practice, professionalism, and social accountability.

Goals 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.

Table of Contents

SECTION – I: RMU – 12 Integrated Modular MBBS Curriculum 2026 Isolation to Beyond Boundaries8

University Moto, Vision, Values & Goals.....9

RMU – 12 Structured Framework of Integrated Modular MBBS Curriculum 2026 16

Isolation to Beyond Boundaries..... 16

RMU – 12 Structured Framework of Integrated Modular MBBS Curriculum 2026 17

RMU – 12 Assessment Framework of Integrated Modular MBBS Curriculum 2026 Isolation to Beyond Boundaries 18

Clinico - Concept Connect Session (C³6).....34

Introduction:.....34

1. Clinical Trigger (Case Introduction).....34

2. Concept Mapping and Exploration34

3. Integrated Discussion.....35

4. Application and Reflection35

Implementation Strategy.....35

Educational Value35

Theme Title from Molecules to Medicine: Clinical Applications of Molecular Biology and Genetics.....36

Clinical Case Scenario: A lady with progressive fatigue.....36

Educational Relevance to Theme.....37

Learning Objectives37

Integration Framework.....37

Harden Level 9 – Multidisciplinary Integration37

Disciplines Involved37

Explicit EPA Mapping.....38

EPA-1: Interpret Clinical and Laboratory Data38

EPA-2: Apply Basic Science to Clinical Reasoning.....38

EPA-3: Communicate Findings in a Structured Manner	38
EPA-4: Demonstrate Professionalism and Teamwork	38
Mapping to Harden Levels.....	39
Teaching–Learning Strategy	39
Assessment Alignment.....	39
Summary Statement	39
Discipline Wise Details of Modular Contents	42
CNS Module-I Team	45
Module IV – CNS Module-I.....	46
Module Outcomes	46
Knowledge	46
Skills	47
Attitude	47
SECTION – II: Teaching and Learning Methodologies / Strategies	48
Terms & Abbreviations	48
Teaching and Learning Methodologies / Strategies	50
Clinico - Concept Connect Session (C ³ 6).....	50
Introduction:.....	50
1. Clinical Trigger (Case Introduction).....	50
2. Concept Mapping and Exploration	50
3. Integrated Discussion.....	51
4. Application and Reflection	51
Implementation Strategy	51
Educational Value	51
Large Group Interactive Session (LGIS)	52

Small Group Discussion (SGD).....	53
Self-Directed Learning (SDL)	55
Case Based Learning (CBL)	55
Problem Based Learning (PBL).....	55
Self-Directed Learning (SDL) at Rawalpindi Medical University (RMU)	56
What is Self-Directed Learning (SDL)?	56
Why is SDL Important in Medical Education?.....	56
SDL Hours in the MBBS Program	56
Assessment of SDL at RMU.....	57
Alignment with PM&DC and WFME Standards	57
PM&DC	57
WFME.....	57
Practical Sessions/Skill Lab (SKL).....	58
SECTION – III: Themes, Learning Objectives, Teaching Strategies & Tool of Assessments	59
Theme 1: Sensory Loss, Numbness & Cranial Trauma-Related Symptoms (1st Week)	61
Specific Learning Objectives	64
Spiral Courses (1 st Week)	69
The Pak Studies.....	69
The Islamiyat.....	69
Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C ³ 6) Sessions for 1 st Week.....	70
Theme 2: Altered Consciousness, Raised ICP & CNS Infection Presentations (2nd Week)	71
Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C ³ 6) Sessions for 2 nd Week.....	82
Theme 3: Epileptic Seizures, Involuntary Movements & Motor Control Disorders (3rd Week)	83
Specific Learning Objectives	86
Spiral Courses (3 rd Week).....	96

The Pak Studies.....	96
The Islamiyat.....	96
Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C ³ 6) Sessions for 3 rd Week	97
Theme 4: Ataxia, Speech Disturbance & Cranial Nerve Dysfunction (4th Week)	98
Specific Learning Objectives.....	101
Spiral Courses (4 th Week).....	108
Behavioral sciences.....	108
The Islamiyat.....	108
Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C ³ 6) Sessions for 4 th Week	109
Theme 5: Hemiplegia, Strokes, Neuro-Degeneration & Behavioral Disturbance (5th Week)	110
Specific Learning Objectives.....	113
Spiral Courses (5 th Week).....	120
Family Medicine	120
Behavioral sciences.....	120
The Pak Studies.....	120
The Islamiyat.....	121
Transdisciplinary (Hardens Level 11) Clinico-Concept Connect (C ³ 6) Sessions for 5 th Week	122
Anatomy LGIS Syllabus of Learning Management System (LMS).....	124
Anatomy SGD Syllabus of Learning Management System (LMS).....	128
Anatomy SKL Syllabus of Learning Management System (SKL).....	133
Physiology Syllabus of Learning Management System (LMS)	134
Case Based Learning Objectives (CBL)	137
SECTION – IV: Assessment.....	138
RMU – 12 Assessment Framework of Integrated Modular MBBS Curriculum 2026	139
Isolation to Beyond Boundaries.....	139

Assessment.....	140
3.1 Formative Assessment	141
3.2 Summative Assessment	141
3.2.1 Components of Assessment	141
3.2.4 Continuous Internal Assessment (CIA)	144
SECTION – VI: Time Table	185
CNS Module-I Team	187
Categorization of Modular Content	191
Anatomy.....	191
Teaching Staff / Human Resource of Department of Anatomy	192
Physiology	193
Teaching Staff / Human Resource of Department of Physiology	195
Biochemistry	196
Annexure I	215
Templates for Theory Paper	215
□ MCQ, SEQ Paper, & EMQ	215
Templates for AV OSPE.....	215
Templates for Structured Viva.....	215
Annexure II	234
CNS Module-I Entrustable Professional Activities (EPAs)	234

RMU – 12 Integrated Modular MBBS Curriculum 2026

Isolation to Beyond Boundaries

Competency Framework



References

- Harden RM. The integration ladder: a tool for curriculum planning and evaluation. *Medical education*. 2000 Jul 1;34(7).
- 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

Figure 1

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

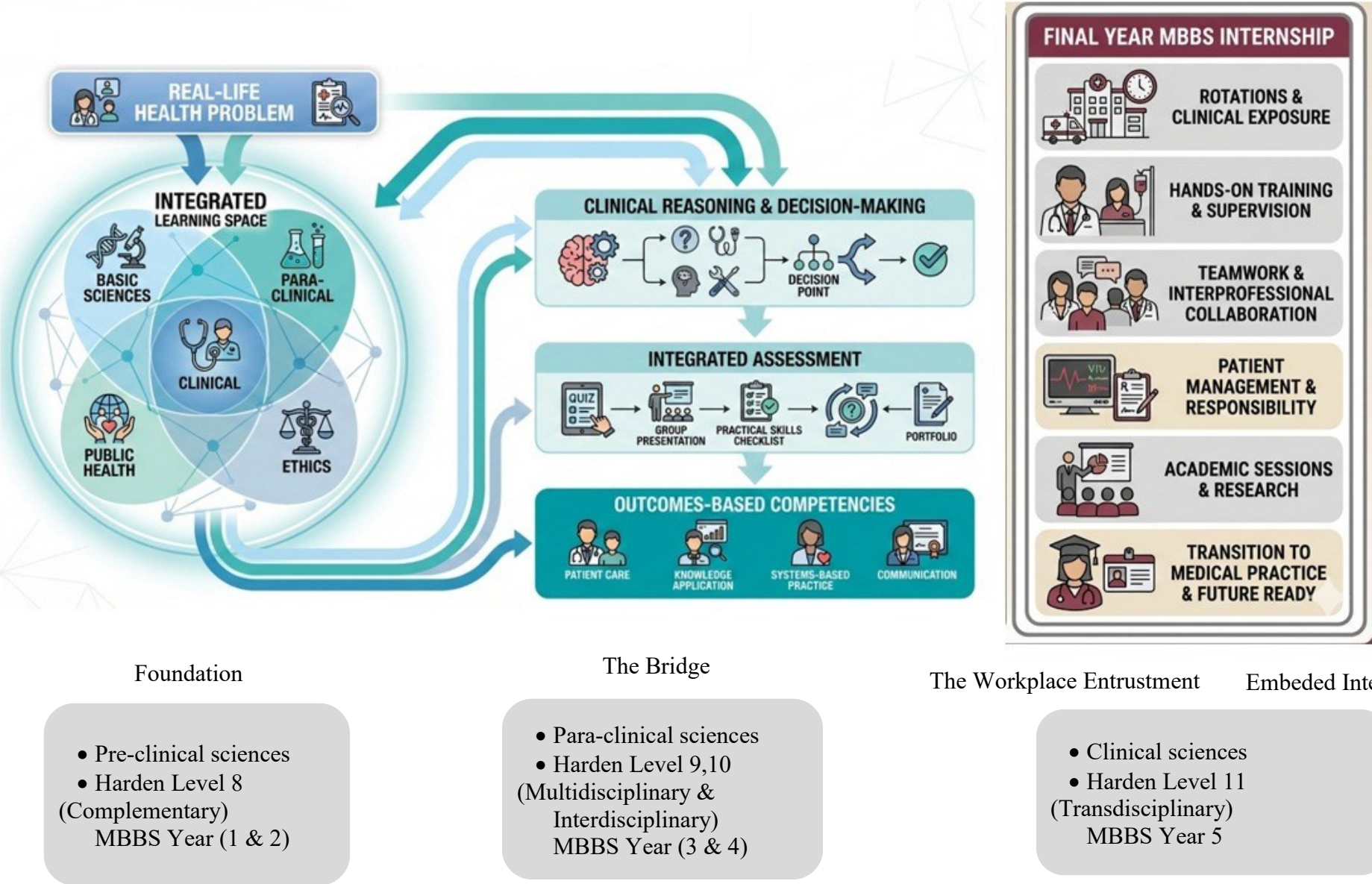


Figure 2

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

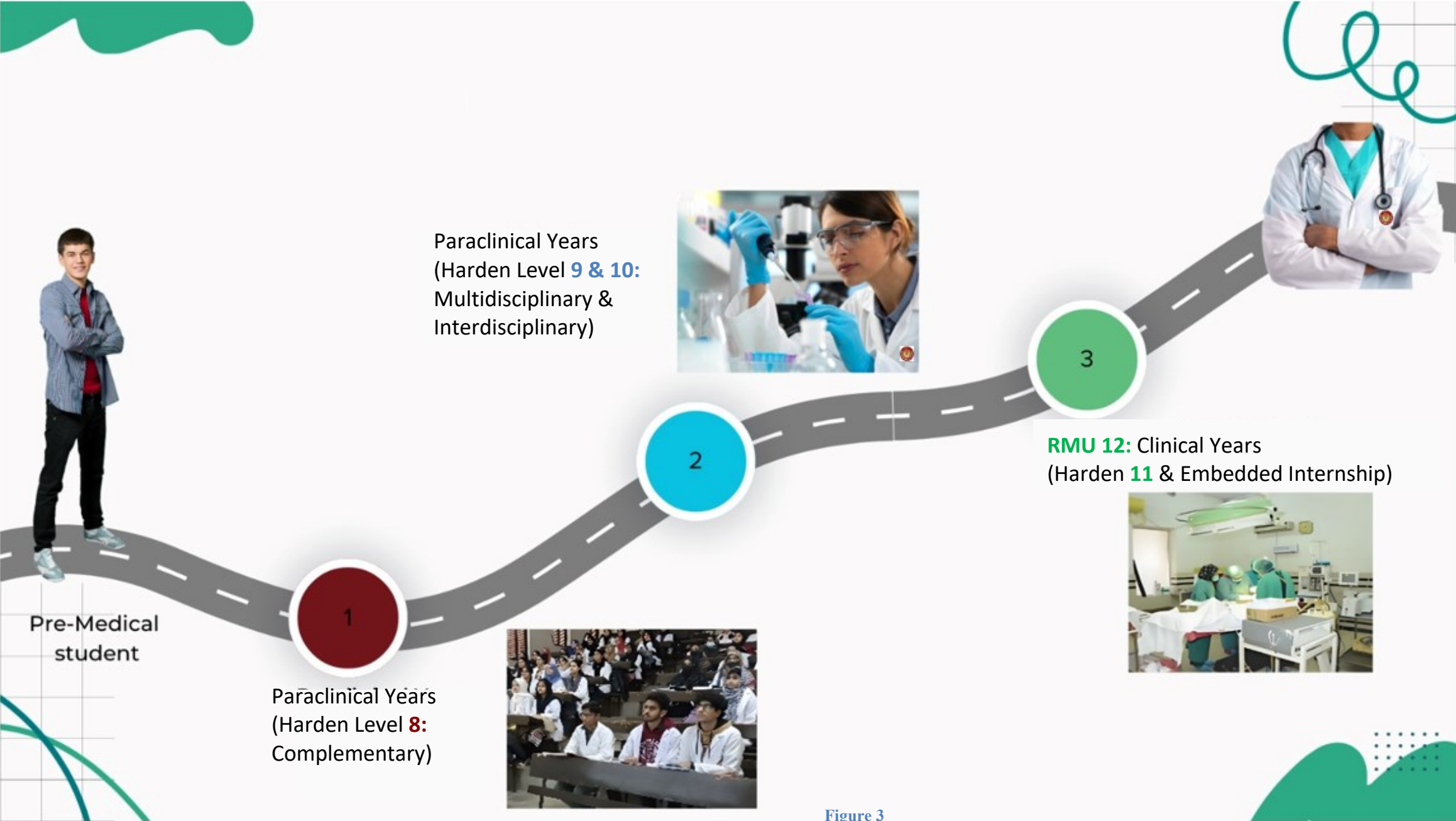


Figure 3

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

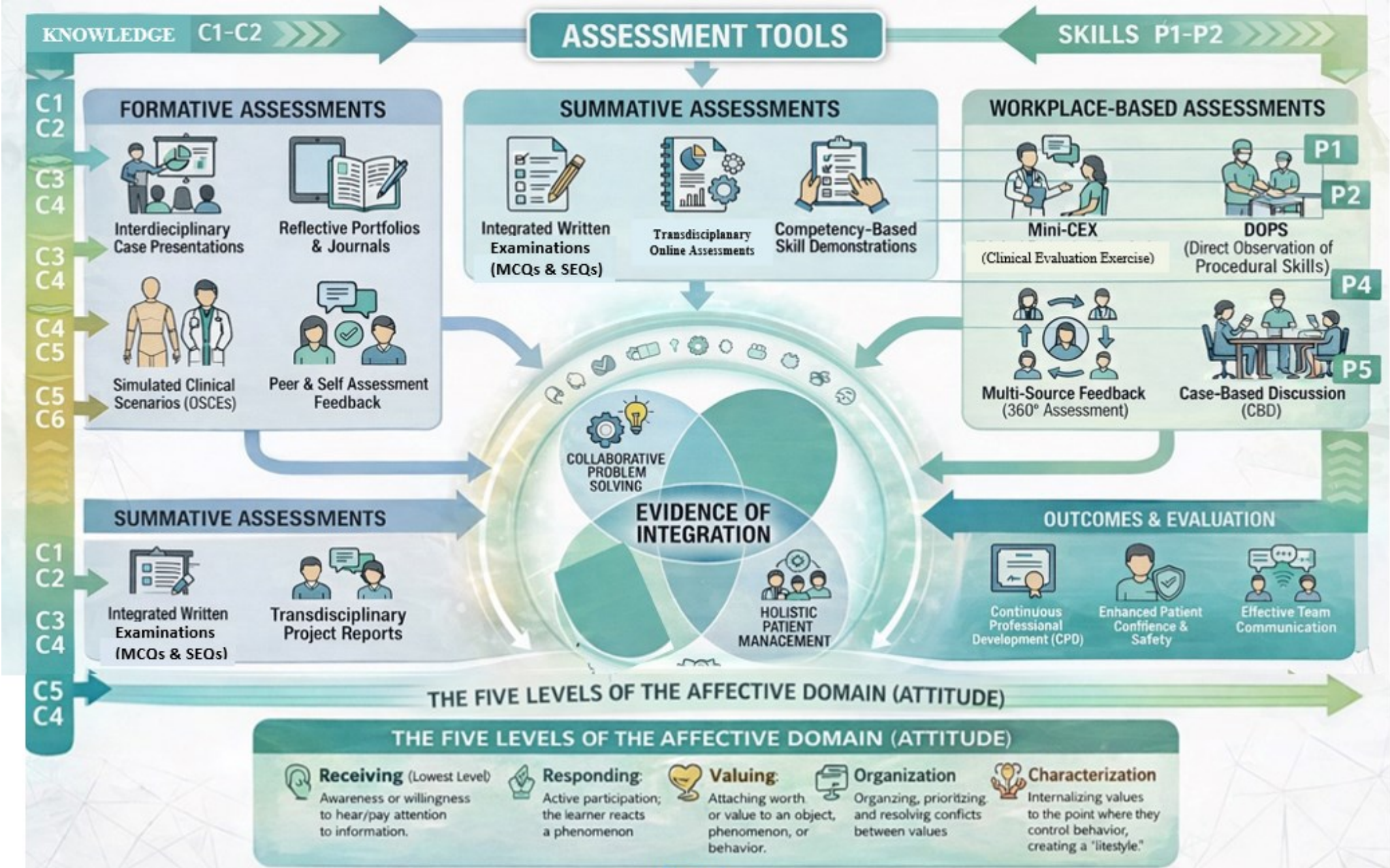


Figure 4

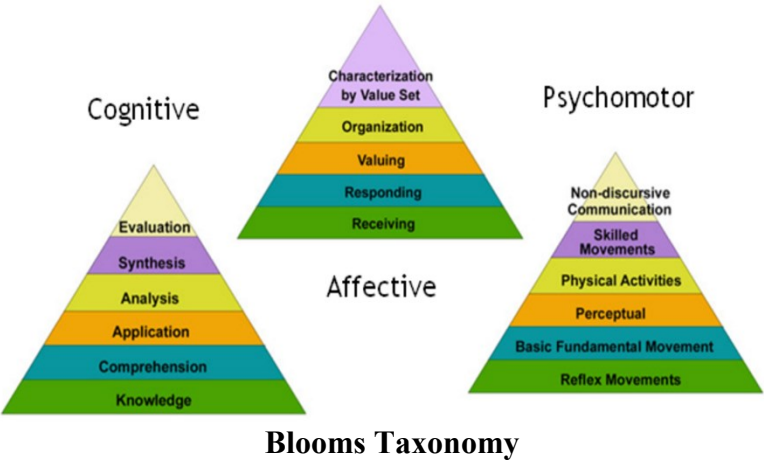
Rawalpindi Medical University has adopted a staged curricular framework that reflects a progressive movement along Harden’s integration ladder, culminating in going beyond the ladder to **RMU 12**. The curriculum is designed to ensure that knowledge acquired in the early years is not isolated or terminal, 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.



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

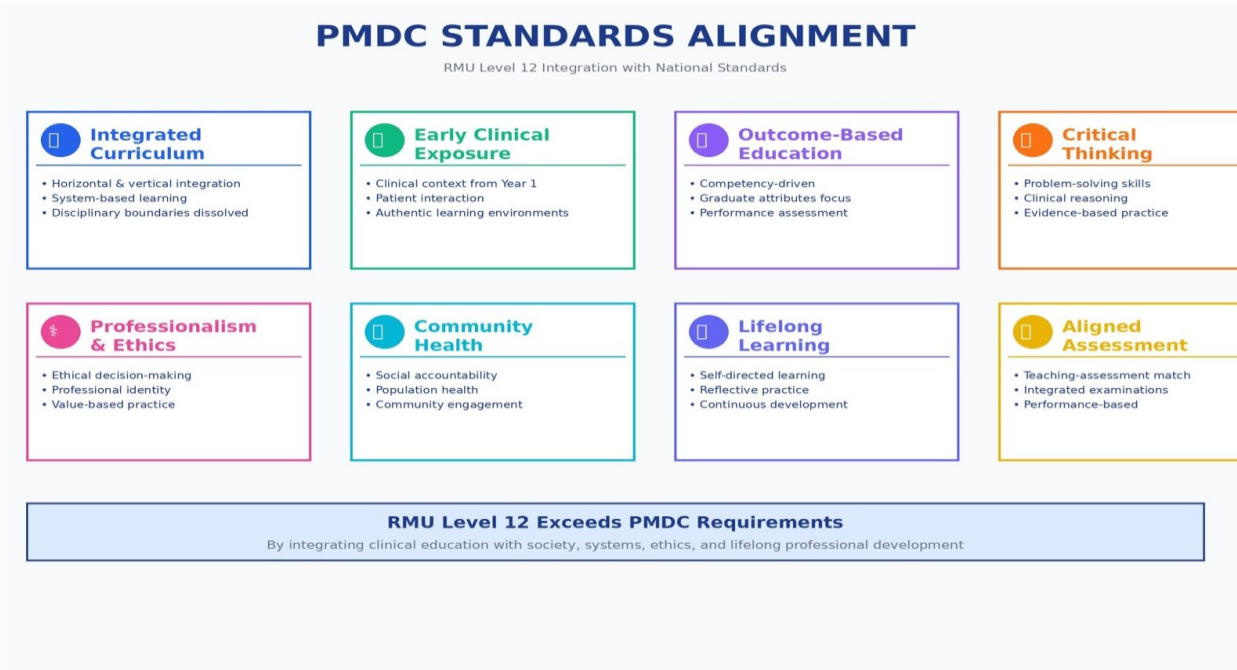
1.1 PMDC Standards for Medical Education

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

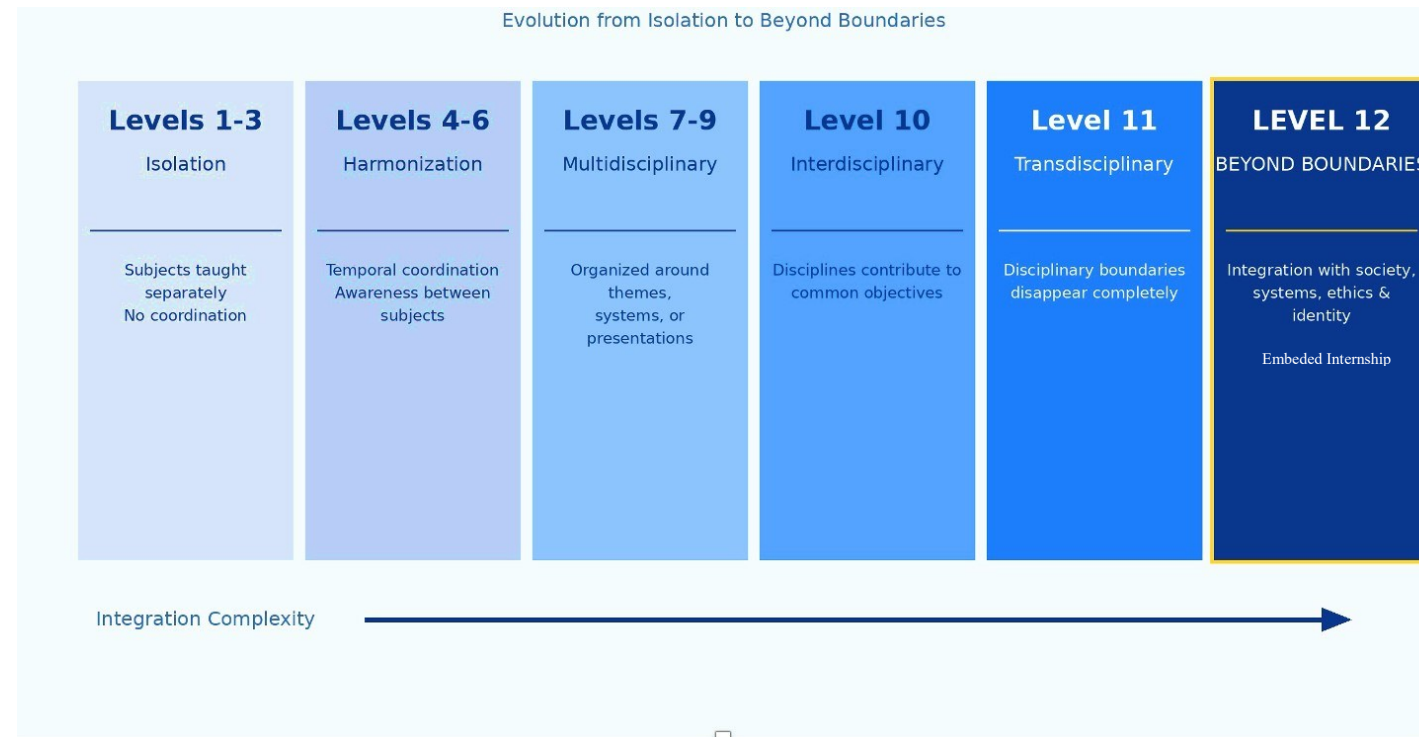
Harden's Integration Ladder provides a systematic framework for evaluating curricular integration, progressing through 11 levels:



Harden's Integration Ladder

RMU

RMU – 12 Beyond Boundaries



2. RMU Level 12 - 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

LEVEL 11 vs LEVEL 12	
The Evolution Beyond Transdisciplinary Integration	
LEVEL 11 Transdisciplinary	LEVEL 12 Beyond Boundaries
Unit of Integration	Unit of Integration
Patient problem	Patient within society, systems, and ethics
Primary Focus	Primary Focus
Clinical problem-solving	Clinical + population health + systems thinking
Scope	Scope
Individual patient care	Individual care + community + healthcare systems
Ethics Approach	Ethics Approach
Integrated within cases	Longitudinally embedded in real decisions
Knowledge Type	Knowledge Type
Knowledge synthesis	Knowledge creation & generation
Learning Organization	Learning Organization
Around clinical problems	Around health challenges & society
Disciplinary Boundaries	Disciplinary Boundaries
Dissolved in teaching	Extended to societal integration
Graduate Outcome	Graduate Outcome
Competent clinician	Adaptive, socially accountable professional
Bloom's Taxonomy	Bloom's Taxonomy
Primarily Analysis	Analysis → Evaluation → Creation

- 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

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

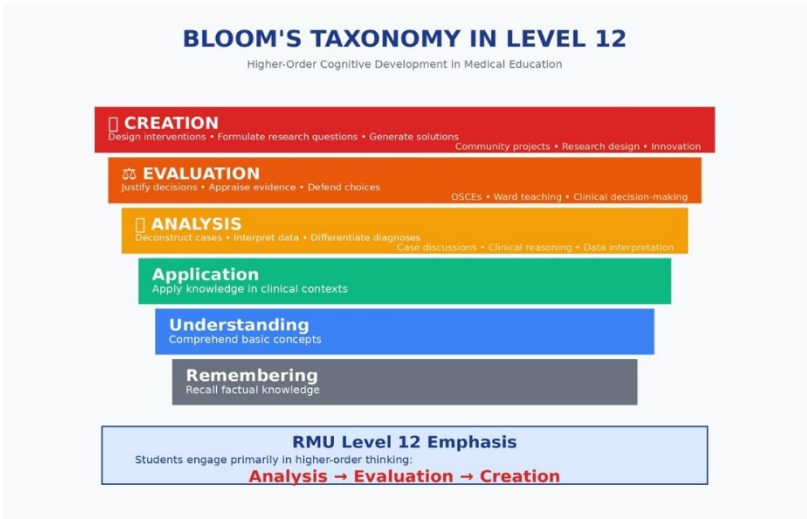
PMDC Competency	RMU Implementation	Level 12 Justification
Medical Knowledge	Integrated system-based modules combining anatomy, physiology, pathology, pharmacology, radiology, and clinical medicine	Knowledge constructed through real patient problems; subject boundaries dissolved
Clinical Skills & Patient 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

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

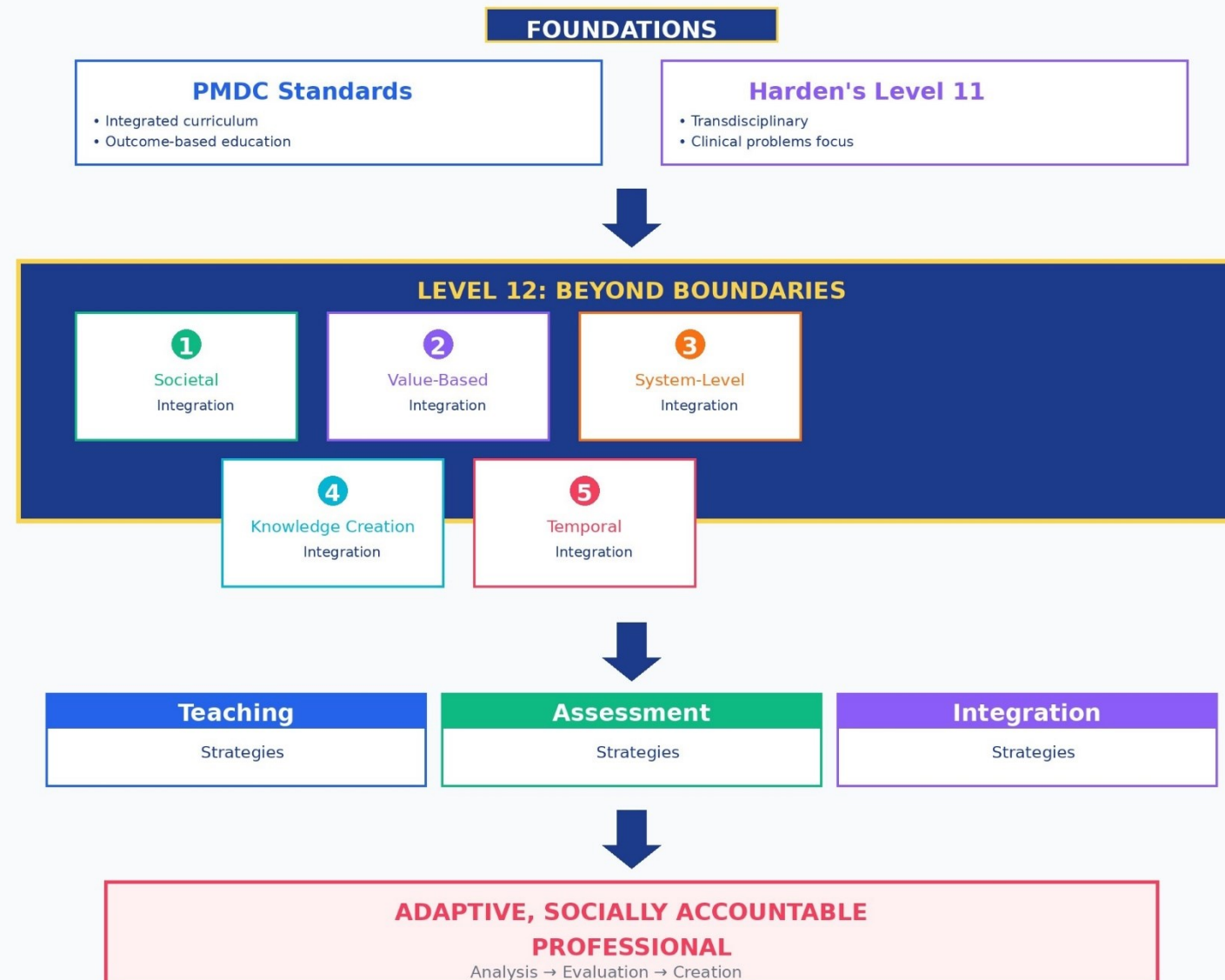
📁 Leadership

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 (C³6)

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**

Harden Level 11
Transdisciplinary

- 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

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

Clinico -Concept Connect (C³6) Session

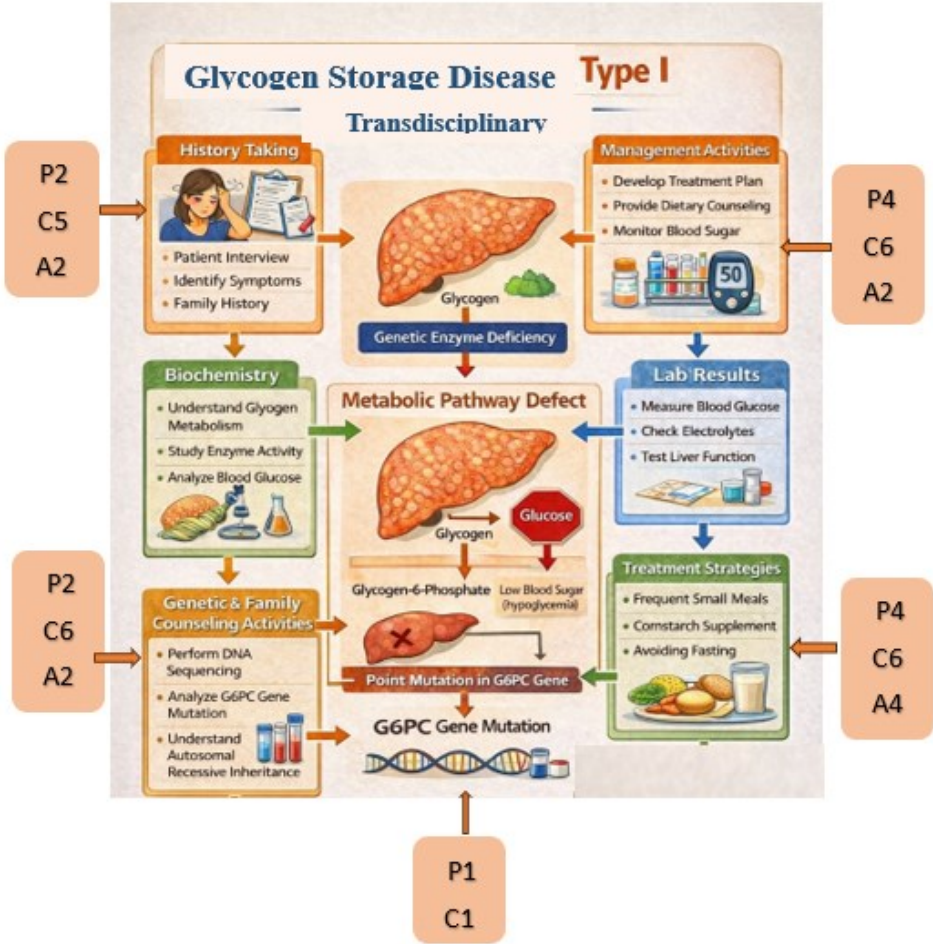
Clinical Case Scenario: A lady with progressive fatigue

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



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				

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
- 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.

RMU – 12 Integrated Modular MBBS Curriculum 2026

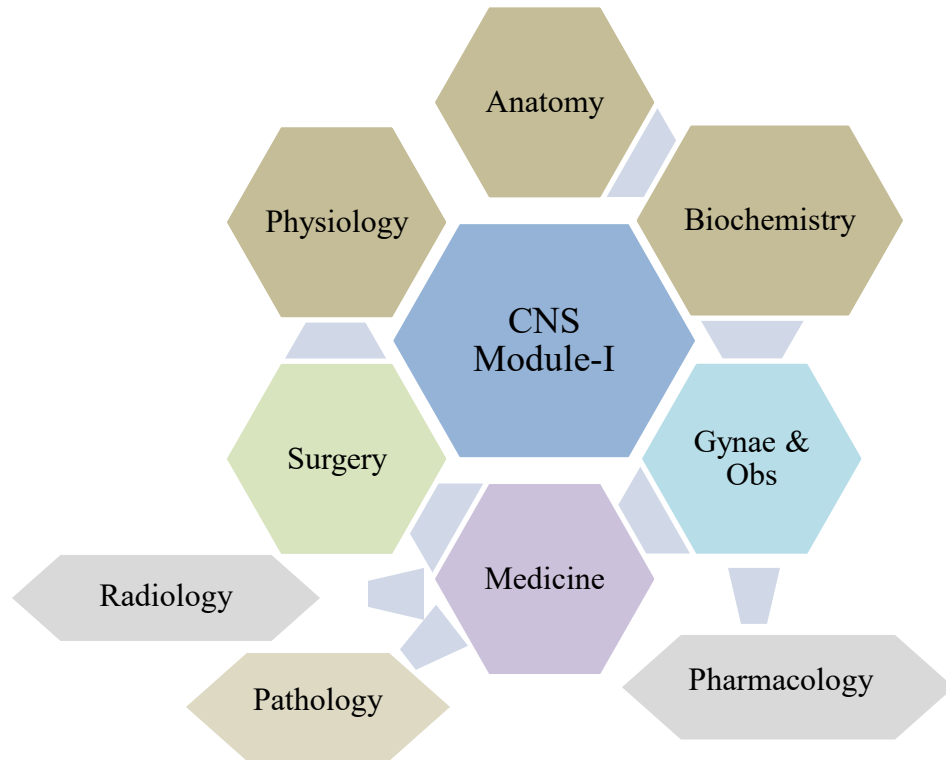
Isolation to Beyond Boundaries

Study Guide

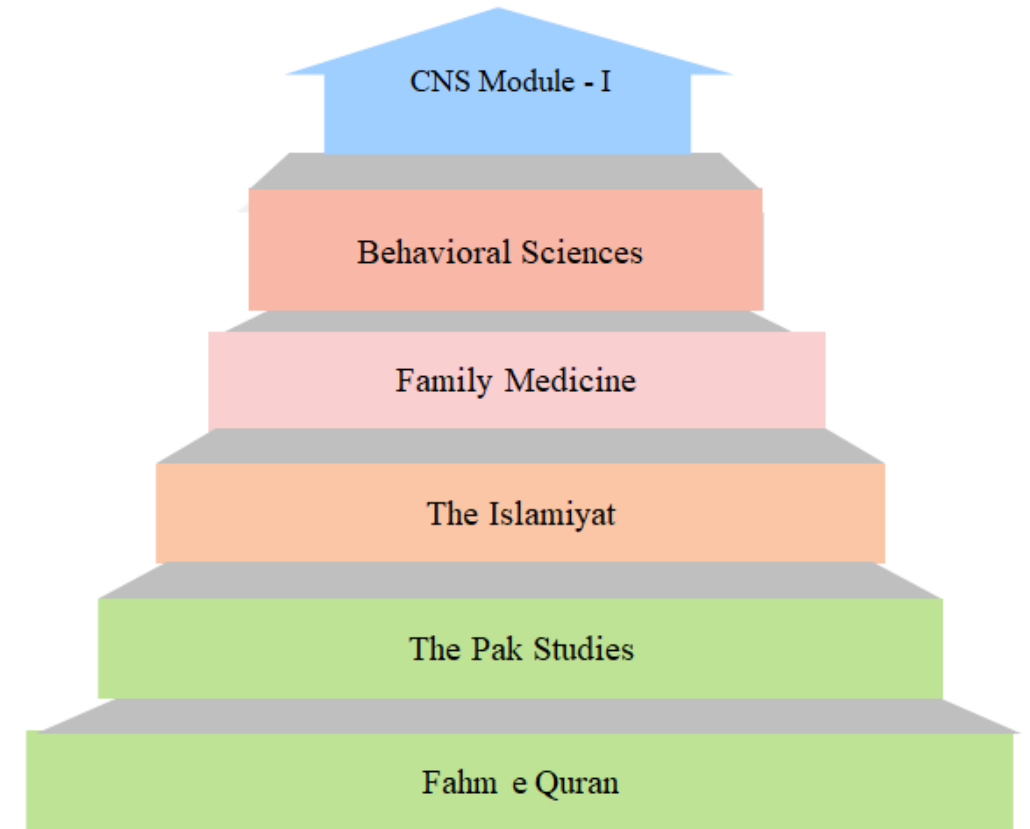
CNS Module - I

Multi-Disciplinary Integration

Integration



Disciplines in CNS Module-I



Spiral / General Education Cluster Courses

Discipline Wise Details of Modular Contents

Integration				
Theory				
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 & Sphingo 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	
• Islamiyat	• 8) Verses about 'Amr bil Ma'ruf wa Nahi anil Munkar' and the importance of 'Amr bil Ma'ruf wa Nahi anil Munkar' • 9) Qualities of Successful People • 10) Rights of People (Life, Honor, Wealth, etc.)
• Pak Studies	• 7) The foundation of the Muslim Ummah • 8) Islamic Democracy • 9) The Economic System of Islam • 10) Protection of Minorities
• Family Medicine	• Approach to a patient with headache
• Behavioral Sciences	• Sleep and Arousal • Defense Mechanism
Vertical Integration	
• Pharmacology	• Introduction to CNS
• Obs & Gynae	• Psychiatric Disorders in Pregnancy (Postpartum Blues Depression Psychosis • Seizures during pregnancy(eclampsia/epilepsy)
• Pathology	• Pattern of Injury in Nerves System • Diseases of Myelin & Neurodegenerative Diseases
• Radiology	• Skull radiograph • CT Scan & MRI (Brain and Spinal Cord)
• Medicine	• Spinal cord and peripheral nervous system • Cerebellar disorders

	• Epilepsy and other convulsive disorders • Encephalitis • Stroke
• Surgery	• Spinal injury and Head injury • Brain Tumors & Brain Abscess • Poly trauma patient

CNS Module-I Team

Module Name : CNS Module-I
 Duration of module : 06 Weeks
 Coordinator : Dr. Sara Bano
 Co-coordinator : Dr. Sadia Baqir
 Reviewed by : Module Committee

Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Sara Bano (Assistant Professor of Anatomy)
2.	Director DME & Dean Basic Sciences	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Farzana Fatima
3.	Additional Director (Assessment) DME	Dr. Arsalan Manzoor Mughal	3.	Co-coordinator	Dr. Minahil Haq (Senior Demonstrator of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Shazia Nosheen (Demonstrator of Physiology)
5.	Chairperson Anatomy	Prof. Dr. Ayesha Yousaf	5.	Co-coordinator	Dr. Rahat (Demonstrator of Biochemistry)
6.	Chairperson Biochemistry	Dr. Aneela Jamil			
7.	Focal Person Anatomy 2 nd Year MBBS	Dr. Maria Tasleem			
8.	Focal Person Physiology	Dr. Sidra Hamid			
9.	Focal Person Pharmacology	Dr. Zunera Hakim	DME Implementation Team		
10.	Focal Person Pathology	Dr. Syeda Ayesha	1.	Director DME	Prof. Dr. Ifra Saeed
11.	Focal Person Behavioral Sciences	Dr. Zona Tahir	2.	Implementation Incharge 1st & 2 nd Year MBBS	Dr. Arsalan Manzoor Mughal Dr. Farzana Fatima
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom	3.	Assistant Director DME	Dr. Farzana Fatima
13.	Focal Person Quran Translation Lectures	Dr. Fahd Anwar	4.	Editor	Muhammad Arslan Aslam
14.	Focal Person Family Medicine	Dr. Sadia Khan			

Module IV – CNS Module-I

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

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

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

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

Module Outcomes

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

Knowledge

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

- Used technology based Medical Education including Artificial Intelligence.
- Appreciate concept and importance of Biomedical Ethics, & Research.

Skills

- Demonstrate dissection and identification of various parts of the nervous system.
- Identify, draw and label histological slides of the nervous system.
- Perform examination of sensory system, motor system, special senses and cranial nerves.
- Demonstrate effective skill for performing estimation of cholesterol, triglycerides and HDL.
- Demonstrate awareness of ethical, legal and social implication of issues related to bioethics

Attitude

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

This module will run in 6 weeks duration. Instructional strategies are given in the time table and learning objectives are given in the study guides. Study guides will be uploaded on the university website. Good luck!

Terms & Abbreviations

Contents

- Domains of Learning
- Teaching and Learning Methodologies/Strategies
 - Clinico Concept Connect Session (C³6)
 - 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 (C³6)

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.

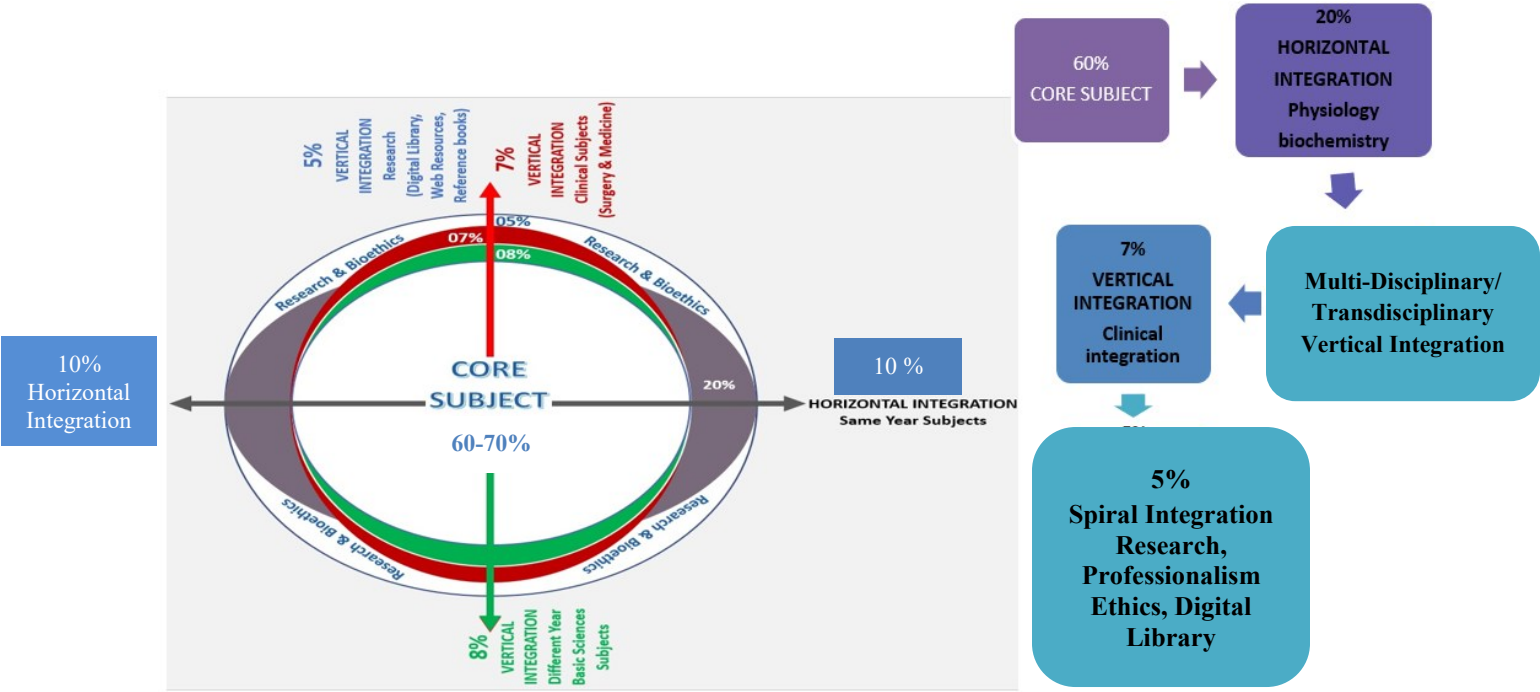
Educational Value

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	Synthese & 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 Year to 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 Year to 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	

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)

CNS Module – I – Second Year MBBS

Duration of Module (Five Weeks)

Sr No.	Themes	Duration
1.	Sensory Loss, Numbness & Cranial Trauma-Related Symptoms	1 st Week
2.	Altered Consciousness, Raised ICP & CNS Infection Presentations	2 nd Week
3.	Epileptic Seizures, Involuntary Movements & Motor Control Disorders	3 rd Week
4.	Ataxia, Speech Disturbance & Cranial Nerve Dysfunction	4 th Week
5.	Hemiplegia, Strokes, Neuro-Degeneration & Behavioral Disturbance	5 th Week

Theme 1: Sensory Loss, Numbness & Cranial Trauma-Related Symptoms (1st Week)

Theme	Rationale	Learning objectives
Sensory Loss, Numbness & Cranial Trauma-Related Symptoms	The week covers synapses, sensory receptors, pain pathways, cranial fossae, autonomic system, meninges, intracranial hemorrhages and spinal pathways. These directly relate to patients presenting with sensory loss, numbness, neuralgia, headache and trauma-related neurological deficits.	By the end of this scenario, students should be able to: - Describe the anatomical basis of skull base injury, meninges, cranial fossae, cranial nerves, and sensory pathways involved in head trauma. - Explain the clinical significance of CSF rhinorrhea, anosmia, facial numbness, limb sensory loss, headache, vomiting, and neck stiffness after cranial trauma. - Correlate sensory symptoms with involvement of cranial nerves and ascending sensory pathways. - Identify red-flag features of head injury requiring urgent neurological assessment, imaging, and referral. - Outline the basic principles of initial management, observation, pain control, and patient counseling in suspected skull base injury.
Case Scenario 1: Head Trauma with CSF Rhinorrhea, Numbness and Altered Sensation A 23-year-old male was brought to the Emergency Department after a road traffic accident that occurred six hours earlier. According to the attendants, the patient was riding a motorcycle without a helmet when he collided with another vehicle and struck the front-right side of his head on the road. Immediately after the incident, he developed severe frontal headache and dizziness, followed by watery discharge from the nose. Since the trauma, the patient has complained of numbness and tingling over the right side of the face and reduced sensation over the right upper limb. He also reports that he is unable to appreciate smell properly since the injury and feels that bright light and noise worsen his headache. The attendants noticed one brief episode of vomiting, but there was no prolonged loss of consciousness. The headache has remained persistent and severe, and the patient now feels increasing discomfort on neck movement and generalized weakness due to pain. He denies previous neurological illness, prior head trauma, or any chronic sensory problem before this event. The overall presentation raises concern for cranial trauma with meningeal injury, possible skull base involvement, and disturbance of sensory pathways requiring urgent clinical assessment. Past Medical History - No known hypertension or diabetes mellitus - No previous neurological disorder - No history of epilepsy or prior head injury Drug History - No regular medication - Received one dose of analgesic in emergency		

Family History

- Non-contributory

Social History

- University student
- Occasional sleep deprivation due to study schedule
- No smoking or alcohol use reported

Examination

General Physical Examination

Young male lying still due to headache and discomfort.

Pulse 92/min, BP 126/82 mmHg, Temp 98.8°F, RR 18/min.

Local / Neurological Examination

- Inspection: Mild right periorbital bruising and watery nasal discharge suggestive of CSF rhinorrhea
- Palpation: Frontal scalp tenderness present
- Sensory examination: Reduced fine touch and pinprick sensation over the right cheek and right upper limb
- Cranial nerves: Diminished sense of smell; pupils equal and reactive
- Motor examination: Power preserved in all four limbs
- Meningeal irritation: Neck stiffness mild

Systemic Examination

CVS, Respiratory, Abdomen: Normal

Educational Relevance (Discipline-wise Integration)

Discipline	Relevance
Anatomy	Anterior, middle and posterior cranial fossae, meninges, dural venous sinuses, cranial nerves, and sensory tracts
Physiology	Sensory receptors, synaptic transmission, pain pathways, sensory pathways, and autonomic responses to trauma
Pathology	Pattern of injury in nervous system, meningeal irritation, and intracranial hemorrhage
Radiology	Role of skull radiograph / CT brain in cranial trauma and skull base injury
Pharmacology / Emergency Care	Initial principles of CNS pharmacology, pain control, and urgency of referral in head injury

Entrustable Professional Activities (EPAs)

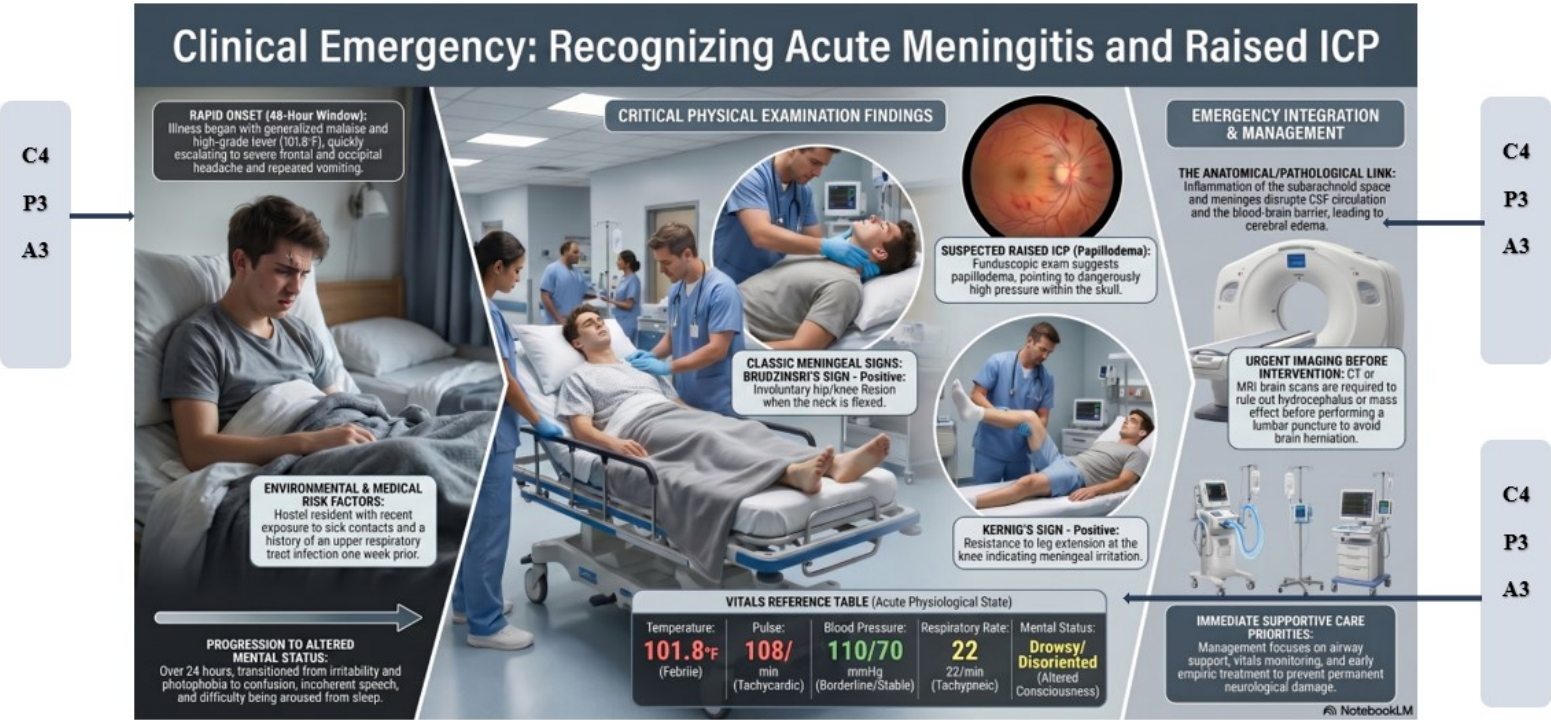
- 1. Obtain a focused history in a patient with cranial trauma and identify red-flag symptoms such as CSF rhinorrhea, vomiting, anosmia, and sensory loss.
- 2. Perform a structured neurological and cranial nerve examination to detect altered sensation and possible meningeal involvement.
- 3. Recognize the need for urgent imaging, referral, and early supportive management in suspected skull base injury or intracranial complication.

EPAs Detail Annexure-II

Harden Level 11 Justification

This case represents an authentic emergency patient-care task in which students must integrate anatomy, physiology, pathology, radiology, and early clinical decision-making simultaneously. The problem is approached as a unified professional activity rather than isolated subject teaching, which reflects practice-based integration at Harden Level 11.

Theme 1 Clinico-Concept Connect (C³6)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Subject	Code	Topics	At the end of lecture students should be able to:	Learning Domains	Calgary Gauge	Teaching Strategy	Assessment Tools
Development							
Anatomy (LGIS)	M5-SpS-A-001	Development of Eye 1	- 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. - 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.. Analyze the sequential embryological development of the eye from the neural tube, surface ectoderm, neural crest cells, and mesoderm, and correlate the contribution of each germ layer to the mature eye. Evaluate the developmental events responsible for normal closure of the embryonic choroidal (optic) fissure and predict the consequences of its failure. Design an embryological pathway explaining the development of a selected congenital eye anomaly, integrating normal and abnormal developmental processes.	C1 C2 C1 C2 C1 C1 C2 C2 C3 C3 C3 C3 C3 C4 C5 C6	Should know Should know 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 Nice to know Nice to know	LGIS	MCQ SAQ VIVA OSPE
Histology							

			• Apply strategic use of AI in health care	C3	Nice to know		
			• Read relevant research article	C3	Nice to know		
			• Analyze the anatomical features visible in the norma frontalis and norma verticalis, distinguishing the bones, sutures, landmarks.	C4	Nice to know		
			• Evaluate the clinical significance of the anatomical landmarks observed in the facial and superior aspects of the cranium in relation to cranial injuries, congenital anomalies, and surgical approaches.	C5	Nice to know		
			• Create a labeled anatomical diagram or three-dimensional model of the norma frontalis and norma verticalis, accurately illustrating the bones, sutures, and key landmarks while explaining their anatomical and clinical relevance.	C6	Nice to know		
	M5-SpS-A-004	External Surface of Cranial Base (Norma Basalis)	• Describe bones forming the base of skull	C2	Should know	Skills Lab	MCQ SAQ VIVA OSPE
			• Explain the details of anterior, middle and posterior part of base of skull	C2	Should know		
			• Identify different foramina and structures passing through them.	C1	Should know		
			• Explain the attachments and relations of base of skull.	C2	Should know		
			• Fracture of cranial base	C2	Should know		
			• Head injuries and intracranial hemorrhage	C3	Should know		
			• Correlate with the clinical conditions	C3	Must know		
			• understand provision of curative and preventive health care measures.	C3	Nice to know		
			• Practice principles of bioethics	C3	Nice to know		
			• Apply strategic use of AI in health care	C3	Nice to know		
			• Read relevant research article	C3	Nice to know		
			• Analyze the anatomical features and relationships of the bones, foramina, and processes visible on the external surface of the cranial base (norma basalis).	C4	Nice to know		
			• Evaluate the clinical significance of the foramina and anatomical landmarks of the external cranial base in skull base injuries and surgical procedures.	C5	Nice to know		

			Create a labeled representation of the external surface of the cranial base (norma basalis) highlighting its major bones, foramina, and anatomical landmarks.	C6	Nice to know		
	M5-SpS-A-005	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	Should know	Skills Lab	MCQ SAQ VIVA OSPE
			Discuss attachments of mastoid and styloid process.	C2	Should know		
			Explain the boundaries of Norma occipitalis.	C2	Should know		
			Identify different foramina and structures passing through them at the base.	C1	Should know		
			Explain its attachments and relations.	C2	Should know		
			Correlate with the clinical conditions	C3	Must know		
			understand provision of curative and preventive health care measures.	C3	Nice to know		
			Practice principles of bioethics	C3	Nice to know		
			Apply strategic use of AI in health care	C3	Nice to know		
			Read relevant research article	C3	Nice to know		
			Analyze the anatomical landmarks of the norma lateralis and norma occipitalis.	C4	Nice to know		
			Evaluate the clinical importance of the lateral and occipital cranial landmarks.	C5	Nice to know		
			Create a labeled diagram of the norma lateralis and norma occipitalis showing key anatomical landmarks.	C6	Nice to know		
	M5-SpS-A-006	Temporomandibular joint (TMJ)	Discuss the temporomandibular joint, its type, formation and neurovascular supply.	C2	Should know	Skills Lab	MCQ SAQ VIVA OSPE
			Describe the movement's axis and muscles involved.	C2	Should know		
			Correlate clinically disorders of the temporo-mandibular joint.	C3	Should know		
			Correlate with the clinical conditions	C3	Must know		
			understand provision of curative and preventive health care measures.	C3	Nice to know		
			Practice principles of bioethics	C3	Nice to know		

			• Apply strategic use of AI in health care	C3	Nice to know		
			• Read relevant research article	C3	Nice to know		
			• Analyze the anatomical structure and movements of the temporomandibular joint (TMJ) .	C4	Nice to know		
			• Evaluate the clinical significance of TMJ anatomy in common disorders	C5	Nice to know		
			• Create a labeled diagram of the TMJ showing its key anatomical structures.	C6	Nice to know		
	M5-SpS-A-007	Scalp and temple	• Explain the extent of scalp	C2	Should know	Skills Lab	MCQ SAQ VIVA OSPE
			• Describe the Scalp layers, nerves & vessels	C2	Should know		
			• Discuss the clinical correlates like scalp injuries and scalp wounds.	C3	Should know		
			• Correlate with the clinical conditions	C3	Must know		
			• understand provision of curative and preventive health care measures.	C3	Nice to know		
			• Practice principles of bioethics	C3	Nice to know		
			• Apply strategic use of AI in health care	C3	Nice to know		
			• Read relevant research article	C3	Nice to know		
			• Analyze the anatomical layers and structures of the scalp and temple.	C4	Nice to know		
			• Evaluate the clinical significance of the scalp and temple in trauma and infection.	C5	Nice to know		
			• Create a labeled diagram of the scalp and temple showing key anatomical features.	C6	Nice to know		

Spiral Courses (1st Week)

The Pak Studies

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M4-CNS-SI(PKS)-001	The foundation of the Muslim Ummah	Explain the role of the Prophet Muhammad (PBUH) in establishing the concept of the Ummah and how early Islamic society was structured around shared values and responsibilities.	C2	LGIS	MCQs
		Discuss the ethical and social responsibilities of a Muslim physician towards the community, in light of the values upheld by the concept of the Ummah.	C2		
		Describe the key principles that form the foundation of the Muslim Ummah, including unity, brotherhood, justice, compassion, and mutual support.	C2	LGIS	MCQs
		Explain the historical examples from the life of the Prophet Muhammad (PBUH) and early Islamic governance that illustrate fair treatment of non-Muslims and minority communities.	C2	LGIS	MCQs

The Islamiyat

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M4-CNS-SI(I)-001	Verses about 'Amr bil Ma'ruf wa Nahi anil Munkar' and the importance of 'Amr bil Ma'ruf wa Nahi anil Munkar'leep and Arousal	Describe the Quranic perspective on 'Amr bil Ma'ruf wa Nahi anil Munkar' (enjoining good and forbidding evil), citing relevant verses,	C2	LGIS	MCQs
		Explain its significance in shaping ethical and moral responsibilities of a Muslim physician.	C2		
		Explain the neurophysiological mechanisms of sleep and arousal, including the role of key brain structures and neurotransmitters involved in the regulation of the sleep-wake cycle.	C2	LGIS	MCQs

Transdisciplinary (Hardens Level 11) **Clinico-Concept Connect (C³6) 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 ³ 6) Session – I	Sensory Loss, Numbness & Cranial Trauma-Related Symptoms	Anatomy	Anterior, middle and posterior cranial fossae, meninges, dural venous sinuses, cranial nerves, and sensory tracts	• Describe the anatomy of the anterior, middle, and posterior cranial fossae.	C3	MCQs
				• Explain the arrangement of meninges and the clinical importance of CSF rhinorrhea.	C3	MCQs
				• Identify the sensory distribution of cranial nerves and major ascending sensory pathways.	C2	MCQs
				• Correlate skull base trauma with anosmia and facial sensory symptoms.	C4	MCQs
		Physiology	Sensory receptors, synaptic transmission, pain pathways, sensory pathways, and autonomic responses to trauma	• Explain the role of sensory receptors and synaptic transmission in perception of pain and touch.	C3	MCQs
				• Relate damage to sensory pathways with numbness, tingling, and altered sensation.	C4	MCQs
				• Discuss the physiological basis of pain transmission and autonomic responses after head trauma	C3	MCQs
		Pathology	Pattern of injury in nervous system, meningeal irritation, and intracranial hemorrhage	• Recognize the basic pattern of nervous system injury after cranial trauma.	C3	MCQs
				• Differentiate meningeal irritation, CSF leak, and intracranial hemorrhage as important consequences of head injury.	C3	MCQs
		Radiology	Role of skull radiograph / CT brain in cranial trauma and skull base injury	• Identify the role of CT scan and basic radiological imaging in suspected skull base injury and intracranial bleeding.	C3	MCQs
				• Correlate radiological findings with clinical presentation in cranial trauma.	C4	MCQs
		Pharmacology	Initial principles of CNS pharmacology, pain control, and urgency of referral in head injury	• Recognize head injury with CSF rhinorrhea as a condition requiring urgent evaluation and referral.	C3	MCQs
				• Outline immediate supportive management principles including observation, analgesia, and avoidance of harmful manipulation.	C3	MCQs
				• Counsel regarding warning signs such as worsening headache, repeated vomiting, altered consciousness, and focal neurological deficit.	C5	MCQs

Theme 2: Altered Consciousness, Raised ICP & CNS Infection Presentations (2nd Week)

Theme	Rationale	Learning objectives
Altered Consciousness, Raised ICP & CNS Infection Presentations	Focus includes somatosensory cortex lesions, CSF/BBB physiology, meningitis, pontine/brainstem anatomy, medullary and midbrain pathologies. These underpin symptoms such as altered sensorium, neck stiffness, fever, photophobia and increased intracranial pressure.	By the end of this scenario, students should be able to: - Describe the anatomy of meninges, subarachnoid space, ventricular system, and CSF circulation in relation to CNS infection and raised intracranial pressure. - Explain the physiological basis of fever, headache, vomiting, photophobia, papilledema, neck stiffness, and altered consciousness. - Recognize meningitis and raised intracranial pressure as neurological emergencies requiring urgent assessment and referral. - Correlate clinical signs such as Kernig’s sign, Brudzinski’s sign, drowsiness, and confusion with meningeal irritation and CNS involvement. - Outline safe initial management principles, including stabilization, neurological examination, neuroimaging where indicated, and caution before lumbar puncture.
Case Scenario 2: Fever, Headache, Neck Stiffness and Altered Consciousness A 19-year-old male college student was brought to the Emergency Department with high-grade fever, severe headache, repeated vomiting, and increasing drowsiness for the last two days. According to his family, the illness started with generalized malaise, body aches, and fever, followed by progressively worsening diffuse headache that became more intense over the frontal and occipital regions. During the past 24 hours, he developed photophobia, irritability, and two episodes of non-projectile vomiting, after which he became increasingly confused and less responsive. His mother reports that he complained of neck pain and was unable to bend his neck comfortably. On the day of presentation, he appeared disoriented, spoke incoherently at times, and was difficult to arouse from sleep. There is no history of recent head trauma, seizures, or previous neurological disease. No focal limb weakness was noted by attendants, but they observed that the patient avoided bright light and kept his eyes closed because of discomfort. The overall presentation raises concern for a central nervous system infection with meningeal irritation and possible raised intracranial pressure requiring urgent assessment and management. Past Medical History - No known diabetes mellitus or hypertension - No previous history of epilepsy or chronic neurological illness - Recent upper respiratory tract infection one week earlier Drug History - Paracetamol taken at home for fever with temporary relief		

- No regular long-term medication

Family History

- Non-contributory

Social History

- Lives in a hostel with recent history of sick contacts
- Poor sleep and reduced oral intake over the last two days
- No smoking or substance use reported

Examination

General Physical Examination

Young male appears acutely ill, febrile, and drowsy.

Pulse 108/min, BP 110/70 mmHg, Temp 101.8°F, RR 22/min.

Neurological / Meningeal Examination

- Mental status: Confused, irritable, and disoriented to time and place
- Neck examination: Marked neck stiffness present
- Meningeal signs: Kernig’s sign and Brudzinski’s sign positive
- Fundus: Papilledema suspected on examination
- Cranial nerves: Pupils equal and reactive; no obvious focal cranial nerve palsy
- Motor examination: No gross focal motor deficit detected
- Sensory examination: Limited due to poor cooperation, grossly intact to painful stimulus

Systemic Examination

CVS, Respiratory, Abdomen: No significant abnormality detected

Educational Relevance (Discipline-wise Integration)

Discipline	Relevance
Anatomy	Meninges, subarachnoid space, ventricular system, CSF circulation, and anatomical basis of raised intracranial pressure
Physiology	Blood-brain barrier, blood-CSF barrier, CSF dynamics, reticular activating system, and basis of altered consciousness
Pathology / Microbiology	Meningitis, inflammatory exudate, cerebral edema, and mechanisms of CNS infection
Medicine / Pediatrics	Recognition of CNS infection, meningeal signs, altered sensorium, and urgency of management

Radiology	Role of CT/MRI brain in raised ICP, hydrocephalus, and complications before lumbar puncture
Clinical Skills	Focused neurological examination, GCS assessment, fundus examination, and safe referral decision-making

Entrustable Professional Activities (EPAs)

- Obtain a focused history in a patient with fever, headache, vomiting, and altered consciousness, and identify red-flag symptoms suggestive of CNS infection or raised intracranial pressure.
- Perform a structured neurological examination including mental status, meningeal signs, and basic cranial nerve assessment.
- Recognize the need for urgent stabilization, neuroimaging when indicated, timely referral, and early empiric management in suspected meningitis.

EPAs Detail Annexure-II

Harden Level 11 Justification

This case reflects an authentic emergency clinical problem in which students must integrate anatomy, physiology, pathology, radiology, and bedside clinical assessment simultaneously. The patient is approached as a unified professional task involving diagnosis, prioritization of safety, and urgent referral, which represents practice-based integration at Harden Level 11.

Theme 2 Clinico-Concept Connect (C³6)

Emergency Clinical Spotlight: Acute Skull Base Trauma & CSF Rhinorrhea

C4
P2
A2

The Clinical Scenario (Patient Profile)



HEADLINE: 23-Year-Old Male, Post-Road Traffic Accident
Supporting Detail: Patient presented 6 hours after striking the front-right side of his head during a motorcycle collision without a helmet.

HEADLINE: Chief Complaints: Persistent Frontal Headache & Dizziness
Supporting Detail: Accompanied by photophobia (light sensitivity), phonophobia (noise sensitivity), and one episode of vomiting.

C4
P3
A3

Physical Examination Findings (EPA 2)



KEY FINDING: Local Inspection: "Raccoon Eyes" & Tenderness
Supporting Detail: Examination reveals mild right periorbital bruising and significant frontal scalp tenderness.

PROCESS STEP: Assessing Meningeal Irritation
Supporting Detail: Mild neck stiffness is present, raising concern for meningeal injury or intracranial complication.

KEY FINDING: Sensory Mapping
Supporting Detail: Clinical tests confirm reduced fine touch and pinprick sensation over the right cheek (cranial nerve V) and right upper limb.

C5
P3
A3

History & Red-Flag Identification (EPA 1)

KEY FINDING: Cranial Nerve & Sensory Deficits
Supporting Detail: Patient reports anosmia (loss of smell), numbness/tingling on the right side of the face, and reduced sensation in the right upper limb.

DEFINITION:
Red Flag: CSF Rhinorrhea
Supporting Detail: The presence of watery nasal discharge following head trauma is a critical indicator of skull base involvement and meningeal injury.

SUPPORTING FACT: Absence of Chronic History
Supporting Detail: History is negative for previous neurological illness, epilepsy, or chronic sensory problems.

PROCESS STEP: Priority One: Urgent Neuroimaging
Supporting Detail: immediate CT brain is required to assess for intracranial hemorrhage, skull base fractures, and the extent of the trauma.



C4
P2
A2

Urgent Professional Activities (EPA 3)



Stabilization & Referral: Ensure immediate
Supporting Detail: Advise on warning signs such as worsening headache, repeated vomiting, or altered consciousness while avoiding harmful manipulation.

Harden Level 11 Transdisciplinary

73 | Page

Specific Learning Objectives

Subject	Code	Topic	At the End of Lecture Students Should Be Able To	Importance	C/P/A	Teaching Strategy	Assessment Tool
Anatomy Embryology	M4-CNS-A-006	Embryology Development of Rhombencephalon	• Describe the development of Myelencephalon	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs
			• Describe the arrangement of neuroblasts in Metencephalon	Should know	C2		
			• Describe the development of Metencephalon	Should know	C2		
			• Describe the arrangement of neuroblasts in Metencephalon	Should know	C2		
			• Correlate the clinical conditions associated with it	Must know	C3		
			• Analyze the impact of the pontine flexure on the spatial rearrangement of the alar and basal plates to explain the distinct medial-to-lateral functional distribution of cranial nerve nuclei in the adult hindbrain.	Must know	C4		
			• Evaluate the embryological progression of the rhombic lips and the roof of the fourth ventricle to deduce the anatomical basis and clinical severity of congenital cerebellar anomalies such as Dandy-Walker syndrome.	Nice to know	C5		
Anatomy Histology	M4-CNS-A-007	Histology Spinal cord and Peripheral Nerve	• Construct an integrated embryological blueprint that traces the distinct cellular differentiation of the metencephalon and myelencephalon into the definitive gross structures.	Nice to know	C6	Skills lab	AVOSPE OSVE OSCE MCQs EMQs SEQs
			• Describe the histological structure of spinal cord	Should know	C2		
			• Describe the histological structure of cerebellum	Should know	C2		
			• Discuss cells in each layer along with its histological morphology	Should know	C2		
			• Illustrate the cross-sectional view of spinal cord and cerebellum	Should know	C3		
			• Correlate the clinical conditions associated with it	Must know	C3		
			• Analyze the microscopic distribution of multipolar neurons and neuroglial cells to differentiate the structural organization of spinal grey matter from white matter.	Nice to know	C4		
			• Evaluate the histological differences between the epineurium, perineurium, and endoneurium to explain their distinct roles in providing mechanical and metabolic protection to nerve fibers.	Nice to know	C5		
			• Construct a comprehensive microscopic map tracing the path of a myelinated axon from its exit at the ventral horn to its peripheral target within a multi-fascicular nerve trunk.	Nice to know	C6		

Gross Anatomy	M4-CNS-A-0016	Descending tracts and their clinicals	List the descending tracts of spinal cord	Should know	C1	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Tabulate the sensation, receptor, first to third order neurons, pathways and destinations of pyramidal and extrapyramidal tracts	Should know	C2		
			Describe and illustrate the pathways of corticospinal tracts	Should know	C2		
			Describe and illustrate the pathways of extrapyramidal tracts	Should know	C2		
			Describe the anatomical basis of the signs and symptoms in lesions of upper and lower motor neuron lesions	Must know	C3		
			Identify the cross-sectional area of damage of spinal cord	Must know	C3		
			Analyze the specific decussation points of the corticospinal tracts to explain the anatomical basis of contralateral versus ipsilateral motor paralysis.	Nice to know	C4		
			Evaluate classic Upper Motor Neuron (UMN) signs such as spasticity and a positive Babinski reflex to accurately localize damage within the descending motor pathways.	Nice to know	C5		
			Construct an flowchart tracing a voluntary motor command from the motor cortex down to the anterior horn cells to predict specific focal lesion outcomes.	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0017	Lesions of Spinal Cord	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.	Must know	C3	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Identify the cross-sectional area of damage of spinal cord	Must know	C3		
			Focus on provision of curative and preventive health care measures	Must know	C3		
			Practice principle of bioethics	Nice to know	C3		
			Apply strategic use of AI in health care	Nice to know	C3		
			Analyze the distinct sensory and motor deficits of classic spinal cord syndromes (e.g., Syringomyelia) to identify the specific anatomical tracts damaged.	Nice to know	C4		
			Evaluate specific combinations of upper and lower motor neuron signs to accurately localize the exact anatomical level of a spinal lesion.	Nice to know	C5		
			Construct a predictive clinical profile detailing the exact bilateral or ipsilateral deficits expected from a specific cross-sectional spinal cord lesion.	Nice to know	C6		

Gross Anatomy	M4-CNS-A-0018	Medulla oblongata	Identify and describe internal structure of medulla on cross sectional diagrams.	Should know	C2	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Describe the anatomical basis and clinical features of raised pressure in posterior cranial fossa, Arnold Chiari malformation, lateral and medial medullary syndrome.	Must know	C2		
			Identify the cross-sectional area of damage of medulla oblongata	Must know	C3		
			Focus on provision of curative and preventive health care measures	Must know	C3		
			Analyze the changing cross-sectional positions of major tracts and nuclei at the levels of the pyramidal decussation, sensory decussation, and olives.	Nice to know	C4		
			Evaluate specific cranial nerve and tract deficits to accurately differentiate between medial (Dejerine) and lateral (Wallenberg) medullary syndromes.	Nice to know	C5		
			Construct a cross-sectional diagnostic map linking focal medullary vascular lesions to their classic "crossed" motor and sensory clinical deficits.	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0019	Pons & the Fourth ventricle	Identify and describe the gross features of Pons on a given specimen/model	Should know	C2	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Identify and describe internal structure of pons on cross sectional diagrams.	Should know	C2		
			Describe the boundaries and relations of 4th ventricle	Should know	C2		
			Describe the anatomical basis of clinical features of tumors, hemorrhage and infarctions of pons	Must know	C3		
			Identify the cross-sectional area of damage of pons	Must know	C3		
			Analyze the surface elevations of the rhomboid fossa to accurately identify the topographical arrangement of the underlying pontine cranial nerve nuclei.	Nice to know	C4		
			Evaluate specific combinations of ipsilateral cranial nerve signs and contralateral long tract deficits to accurately localize a vascular lesion within the medial or lateral pons.	Nice to know	C5		

			Construct an anatomical flow-map linking the boundaries and outflow foramina of the fourth ventricle to predict the specific structural and clinical consequences of obstructive hydrocephalus.	Nice to know	C6			
Gross Anatomy	M4-CNS-A-0020	Midbrain & Cerebral aqueduct	Identify and describe the gross features of Pons on a given specimen/model	Should know	C2	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs	
			Identify and describe internal structure of pons on cross sectional diagrams.	Should know	C2			
			Describe the boundaries and relations of 4th ventricle	Should know	C2			
			Describe the anatomical basis of trauma, cerebral aqueduct stenosis and vascular lesions of midbrain.	Must know	C3			
			Identify the cross-sectional area of damage of pons	Must know	C3			
			Focus on provision of curative and preventive health care measures	Must know	C3			
			Practice principle of bioethics	Nice to know	C3			
			Apply strategic use of AI in health care	Nice to know	C3			
			Analyze the distinct cross-sectional arrangement of cranial nerve nuclei and tracts at the superior versus inferior collicular levels of the midbrain.	Nice to know	C4			
			Evaluate specific ipsilateral cranial nerve III signs and contralateral motor deficits to accurately localize focal vascular lesions within the midbrain.	Nice to know	C5			
			Construct an anatomical flow-map of the cerebral aqueduct to predict the specific structural and neurological consequences of non-communicating hydrocephalus.	Nice to know	C6			
Physiology (LGIS)	M4-CNS-P-009	Somatosensory cortex & lesions	Explain cortical mapping & association cortex	C 2	Must Know	A	LGIS	MCQ SEQ VIVA
			Describe lesions of somatosensory areas	C 1	Must Know	A		
			Summarize role of thalamus in somatic sensations	C 1	Must Know	A		
			Interpret the importance of dermatomes	C 2	Should Know	B		
	M4-CNS-P-0014	Basic Characteristics of sympathetic & parasympathetic function	Compare and contrast sympathetic and parasympathetic nervous system	C4	Must Know	A	LGIS	MCQ SEQ VIVA
			Enumerate & explain their receptors, neurotransmitters& physiological effects	C 1	Should Know	B		
			Describe physiological anatomy & effects of adrenal medulla	C 2	Must Know	A		

	M4-CNS-P-0015	Excitatory & inhibitory effects of sympathetic & parasympathetic stimulation	• Briefly explain physiological actions of ANS, vasomotor tone, vagal tone & sympathetic stress response	C 1	Should Know	A	LGIS	MCQ SEQ VIVA
			• Draw a table showing autonomic effects on various body organs	C 1	Must Know	A		
			• Briefly describe the pharmacology of autonomic nervous system	C 2	Should Know	B		
	M4-CNS-P-0038	Concept of Association areas, dominant and non-dominant cerebral hemispheres	• Classify various association areas of brain	C4	Must Know	A	LGIS	MCQ SEQ VIVA
			• Describe association areas of brain regarding their physiological role	C 1	Must Know	A		
			• Explain briefly the clinical features, if the association areas become damaged	C 1	Must Know	A		
			• Describe concept of dominant hemisphere	C 2	Should Know	B		
			• Enlist role of parieto-occipito temporal cortex in non-dominant hemisphere	C 2	Should Know	B		
	M4-CNS-P-0039	CSF, BBB, Blood CSF Barrier, LP	• Describe briefly the physiological anatomy of cerebral blood flow	C 2	Must Know	A	LGIS	MCQ SEQ VIVA
			• Explain cerebrospinal fluid system	C 2	Must Know	A		
	M4-CNS-P-0040	CSF, BBB, Blood CSF Barrier, LP (cont.)	• Describe the CSF pressure, its measurement by lumbar puncture, &hydrocephalus	C 1	Must Know	A	LGIS	MCQ SEQ VIVA
			• Differentiate blood CSF barrier &BBB	C4	Must Know	A		
			• Describe brain edema	C 1	Must Know	A		
	M4-CNS-P-0041	Speech and aphasia	• Describe sensory and motor aspects of communication	C 1	Should Know	B	LGIS	MCQ SEQ VIVA
			• Define Wernicke’s aphasia, Motor aphasia & Global aphasia	C 2	Should Know	B		
	M4-CNS-P-0044	Limbic system	• Describe the concept of limbic system	C 2	Must Know	A	LGIS	MCQ SEQ VIVA
			• Describe physiological anatomy of limbic system	C 2	Must Know	A		
			• Enumerate and explain the roles of hippocampus, amygdala and limbic cortex	C 2	Must Know	A		
	M4-CNS-P-0045	Functions of hypothalamus	• Describe physiological anatomy of hypothalamus	C 1	Must Know	A	LGIS	MCQ SEQ VIVA
			• Enlist functions of hypothalamus	C 2	Must Know	A		
			• Explain role of hypothalamus in: ○ Vegetative function ○ Endocrine function Behavioral function ○ Reward and punishment function	C 1	Must Know	A		
Physiology	M4-CNS-P-0050		• Describe general organization of autonomic nervous system			C1		MCQ

(SGD)		Introduction to autonomic nervous system Basic Characteristics of sympathetic & parasympathetic function	• Enumerate the functions of autonomic nervous system		C1	LGIS	SEQ VIVA
			• Compare sympathetic and parasympathetic nervous system		C4		
			• 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		
Biochemistry (LGIS)	M4-CNS-B-06	Metabolism of LDL and HDL	• Explain LDL & HDL formation and its transport • Correlate causes and effects of Hypercholesterolemia • Reframe the mechanism of atherosclerosis • 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
	M4-CNS-B-07,8	Fatty Acid Oxidation -I,II	• Explain Basis of fatty acid oxidation • Reframe related clinical disorders • Role play principles of bioethics • Design curative and preventive healthcare measures. • Use HEC digital library	Must Know	C2 C5 C6 C6 C3	LGIS	MCQs, SAQs SEQs Viva
	M4-CNS-B-09	Hyperlipidemia and fatty liver	• Describe types of hyperlipidemias • Explain the mechanism of formation of fatty liver disease • Design 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 C2 C6 C3 C2 C3	LGIS	MCQs SAQs Viva
Biochemistry (SGD)	M4-CNS-B-10	Fatty Acid Oxidation	• Differentiate between mitochondrial, peroxisomal, and ω-oxidation of fatty acids. • Analyze the role of the carnitine shuttle in regulating fatty acid entry into mitochondria.	Should Know	C4	CBL	MCQs SAQs Viva

			- Examine the effects of malonyl-CoA on the regulation of fatty acid oxidation. - Analyze the biochemical basis of hypoketotic hypoglycemia in disorders of fatty acid oxidation. - Compare the metabolic adaptations of fatty acid oxidation during fed, fasting, and starvation states.				
Biochemistry (SDL)	M4-CNS-B-11	HDL Metabolism	- Illustrate the pathway of HDL metabolism from nascent HDL formation to hepatic cholesterol delivery. - Apply the concept of reverse cholesterol transport to explain the cardioprotective role of HDL. - Demonstrate how HDL interacts with peripheral tissues to remove excess cholesterol. - Use knowledge of HDL metabolism to interpret changes in HDL levels in common clinical conditions. - Predict the effects of LCAT deficiency on HDL structure and function.	Lippincott Biochemistry Chapter. 18 page 253 https://www.alilamedicalmedia.com/-/g...			
	M4-CNS-B-12	Hyperlipidemias	- Differentiate between familial and acquired forms of hyperlipidemia based on clinical and biochemical findings. - Analyze the metabolic defects responsible for various types of hyperlipoproteinemias. - Examine the mechanisms through which elevated LDL contributes to atherogenesis. - Analyze the consequences of abnormalities in apolipoproteins, lipoprotein receptors, and lipid-metabolizing enzymes.	Harper's Illustrated Biochemistry- chapter 26, page 258			
Biochemistry (SKL)	M4-CNS-B-013	Detection of Cholesterol crystals	Perform cholesterol Crystals Deduction Test.	Should Know	P	Skill Lab	OSPE
Pathology	M4-CNS-VI(Path)-002	Diseases of Myelin & Neurodegenerative Diseases	Describe the pathophysiology and histomorphology of Alzheimer's disease, Parkinson's Disease, Huntington's disease and Multiple sclerosis	C2		LGIS	MCQs

Medicine	M4-CNS-VI(Med)-005	Encephalitis	Define and discuss and discuss pathophysiology, symptoms and signs	C1	LGIS	MCQs
			Discuss the causes	C2		
			Describe the management	C2		
Radiology	M4-CNS-VI(R)-001	Skull Radiograph	Interpret Normal Skull Radiograph	C1	LGIS	MCQs
			Discuss fractures and other diseases with their clinical significance	C2		

Transdisciplinary (Hardens Level 11) **Clinico-Concept Connect (C³6) 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) Session – II	Altered Consciousness, Raised ICP & CNS Infection Presentations	Anatomy	Meninges, subarachnoid space, ventricular system, CSF circulation, and anatomical basis of raised intracranial pressure	• Describe the anatomy of the meninges, dural venous sinuses, and subarachnoid space.	C3	MCQs
				• Explain the ventricular system, CSF circulation, and anatomical causes of raised intracranial pressure.	C3	MCQs
				• Correlate meningeal inflammation with neck stiffness and photophobia.	C3	MCQs
		Physiology	Blood-brain barrier, blood-CSF barrier, CSF dynamics, reticular activating system, and basis of altered consciousness	• Explain the formation and function of CSF, blood-brain barrier, and blood-CSF barrier.	C3	MCQs
				• Relate increased intracranial pressure to vomiting, papilledema, and altered consciousness.	C4	MCQs
				• Discuss the role of the reticular activating system in maintenance of consciousness.	C3	MCQs
		Pathology	Meningitis, inflammatory exudate, cerebral edema, and mechanisms of CNS infection	• Recognize meningitis as an inflammatory condition of the meninges and outline its basic pathological changes.	C3	MCQs
				• Differentiate CNS infection from other causes of headache and altered sensorium.	C3	MCQs
				• Identify complications such as cerebral edema, hydrocephalus, and herniation.	C3	MCQs
		Radiology	Recognition of CNS infection, meningeal signs, altered sensorium, and urgency of management	• Identify the role of CT / MRI brain in suspected raised intracranial pressure or focal complication.	C3	MCQs
				• Correlate neuroimaging with ventricular dilatation, edema, or mass effect in CNS infection.	C4	MCQs
		Medicine	Role of CT/MRI brain in raised ICP, hydrocephalus, and complications before lumbar puncture	• Recognize meningitis with altered consciousness as a medical emergency requiring urgent referral and treatment.	C3	MCQs
				• Perform focused neurological examination including meningeal signs and level of consciousness assessment.	C3	MCQs
				• Outline safe initial management principles, including airway support, monitoring, and caution before lumbar puncture in raised ICP.	C4	MCQs

Theme 3: Epileptic Seizures, Involuntary Movements & Motor Control Disorders (3rd Week)

Theme	Rationale	Learning objectives
Epileptic Seizures, Involuntary Movements & Motor Control Disorders	Students learn EEG/epilepsy physiology, cerebellar circuitry, thalamus/subthalamus, motor pathways, cortical functional areas and spinal reflex control. These explain seizure activity, tremors, ataxia and involuntary movements seen in neurology clinics.	By the end of this scenario, students should be able to: - Describe the anatomical structures involved in seizure generation, including the cerebral cortex, thalamus, hypothalamus, limbic system, and motor pathways. - Explain the physiological basis of abnormal neuronal excitability, synchronized discharge, tonic-clonic movements, and post-ictal confusion. - Identify common clinical features of generalized tonic-clonic seizures, including loss of consciousness, jerky movements, tongue bite, frothing, cyanosis, and post-ictal drowsiness. - Differentiate epileptic seizures from other causes of transient loss of consciousness such as syncope, febrile seizures, and psychogenic events. - Outline the principles of immediate supportive care, trigger identification, counseling, referral, and basic antiepileptic drug awareness.
Case Scenario 3: Generalized Tonic-Clonic Seizure with Post-Ictal Confusion A 17-year-old female student was brought to the Emergency Department after an episode of sudden loss of consciousness associated with generalized jerky movements of all four limbs that lasted for nearly two minutes. According to her mother, the patient was apparently well earlier in the day but suddenly became unresponsive, developed upward rolling of the eyes, clenching of teeth, and rhythmic tonic-clonic movements involving the whole body. Frothing from the mouth was noted during the episode, and there was brief cyanosis around the lips. There was no definite history of preceding trauma, fever, or drug ingestion. After the convulsion stopped, the patient remained confused, drowsy, and unable to recognize attendants for about fifteen minutes. On further inquiry, the family reported that she had been sleeping poorly for the last few nights due to examination stress and had skipped meals on the day of presentation. They also mentioned that for the past few months she had occasional brief episodes of vacant staring lasting a few seconds, which were ignored. There is no history of focal limb weakness, persistent headache, vomiting, or recent infection. The current episode raised concern for a seizure disorder and required detailed neurological assessment and integrated clinical evaluation. Past Medical History - No known diabetes mellitus or hypertension - No previous diagnosed neurological illness - History of brief uninvestigated staring spells over the last few months		

Drug History

- No regular medication
- No known use of recreational drugs

Family History

- Maternal cousin has epilepsy

Social History

- College student with recent sleep deprivation due to examinations
- Irregular meals over the previous 24 hours
- No smoking or alcohol use reported

Examination

General Physical Examination

Patient is drowsy but arousable in the post-ictal period.

Pulse 102/min, BP 118/76 mmHg, Temp 98.7°F, RR 20/min.

Neurological Examination

- Consciousness: Post-ictal confusion present; oriented gradually after observation
- Pupils: Equal and reactive to light
- Motor examination: Tone and power grossly preserved in all four limbs after recovery
- Sensory examination: No focal sensory deficit detected
- Reflexes: Symmetrical; plantar responses flexor bilaterally
- Other findings: Bite mark noted on lateral aspect of tongue

Systemic Examination

CVS, Respiratory, Abdomen: Normal

Educational Relevance (Discipline-wise Integration)

Discipline	Relevance
Anatomy	Cerebrum, cerebral cortex, thalamus, hypothalamus, limbic system, and motor pathways relevant to seizure generation and involuntary movements
Physiology	EEG and epilepsy, reticular activating system, learning and memory, motor nervous system, and neuronal excitability
Biochemistry	Metabolic contributors to seizures such as disturbed glucose handling and neuronal energy dependence

Pathology / Medicine	Epilepsy, seizure disorders, causes of altered neuronal discharge, and differential diagnosis of convulsions
Pharmacology	Introduction to CNS pharmacology and basic principles of antiepileptic drug therapy
Radiology	Role of CT/MRI brain in evaluating structural causes of seizures and motor control disorders

Entrustable Professional Activities (EPAs)

- Obtain a focused history in a patient presenting with seizure, including eyewitness account, triggers, post-ictal symptoms, and previous episodes.
- Perform a structured neurological examination after seizure recovery and identify signs suggesting focal neurological deficit or secondary cause.
- Recognize the need for urgent stabilization, appropriate referral, and counseling regarding seizure precautions and trigger avoidance.

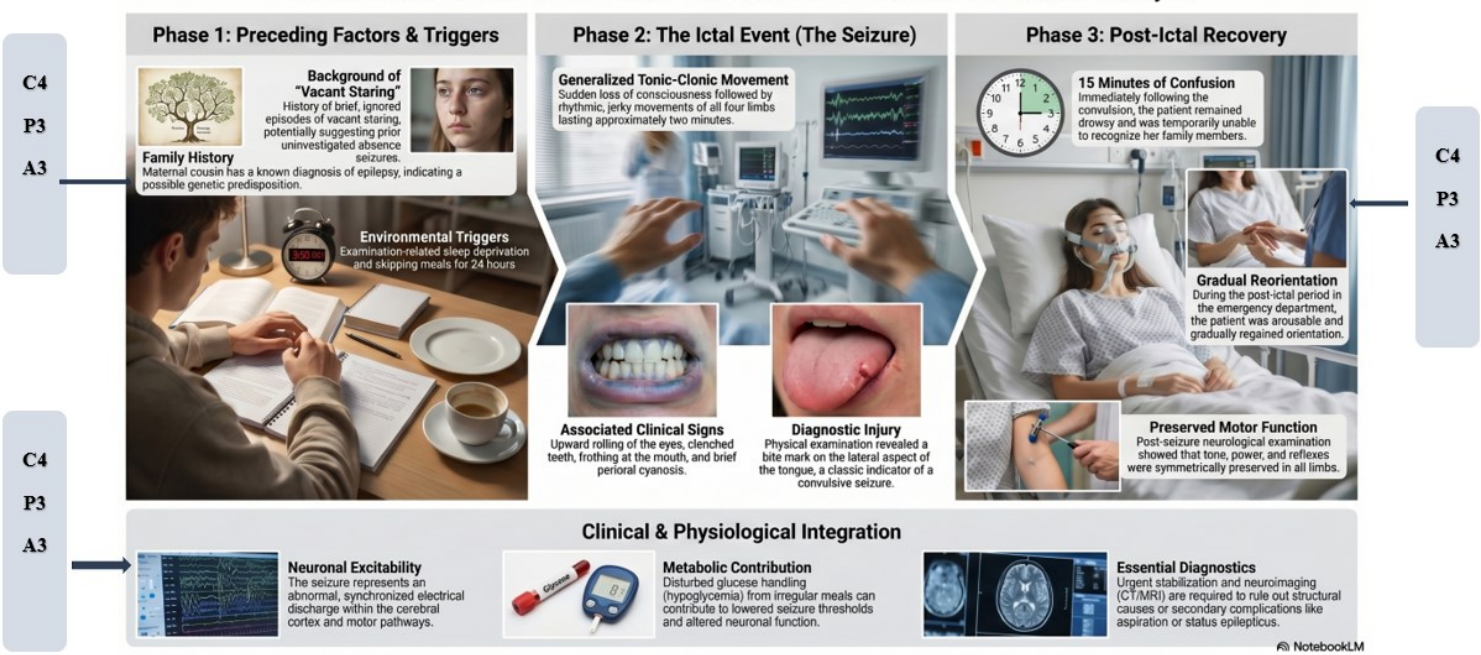
EPAs Detail Annexure-II

Harden Level 11 Justification

This case represents an authentic emergency patient-care task in which students must integrate anatomy, physiology, biochemistry, pathology, pharmacology, and clinical reasoning simultaneously while assessing a patient with seizure and involuntary movements, reflecting practice-based transdisciplinary learning consistent with Harden Level 11.

Theme 3 Clinico-Concept Connect (C³6)

Clinical Profile of a Generalized Tonic-Clonic Seizure: Case Study 3



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Subject	Code	Topic	At the End of Lecture Students Should Be Able To	Importance	C/P/A	Teaching Strategy	Assessment Tool
Anatomy Embryology	M4-CNS-A-008	Embryology Development of Mesencephalon and Prosencephalon	• Describe the development of Mesencephalon	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs
			• Describe the arrangement of neuroblasts in mesencephalon	Should know	C2		
			• Describe the development of pituitary gland	Should know	C2		
			• Discuss the anatomical basis of pharyngeal hypophysis and craniopharyngiomas	Must know	C3		
			• Discuss the anatomical basis of birth defects such as encephalocele, microencephaly, Arnold Chiari malformation	Must know	C3		
			• Analyze the morphological division of the prosencephalon to trace the specific developmental origins of the cerebral cortex, basal ganglia, and thalamic structures.	Nice to know	C4		
			• Evaluate the embryological failure of midline prosencephalic cleavage to deduce the anatomical and clinical severity of congenital holoprosencephaly.	Nice to know	C5		
			• Construct a unified embryological map tracing the structural differentiation and associated ventricular spaces of the mesencephalon and prosencephalon into the adult brain.	Nice to know	C6		
Histology Anatomy	M4-CNS-A-007	Histology of Cerebellum	• Explain the distinct histological features and cellular densities that characterize the molecular, Purkinje, and granular layers of the cerebellar cortex.	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs
			• Discuss cells in each layer along with its histological morphology	Must know	C3		
			• Analyze the histological differences between the inhibitory Purkinje cells and excitatory granular cells to explain their contrasting roles in cerebellar output.	Nice to know	C4		
			• Evaluate the histological integrity of the cerebellar cortical layers to differentiate between normal age-related changes and pathological neuronal loss.	Nice to know	C5		

			Construct a microscopic wiring diagram mapping the flow of impulses from afferent mossy and climbing fibers through the cortical layers to the deep cerebellar nuclei.	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0022	Thalamus, Epithalamus & Subthalamus	Identify and describe the gross structure of thalamus, epithalamus and subthalamus	Should know	C2	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Enlist nuclei of thalamus, epithalamus & subthalamus and describe their functions	Should know	C1		
			Describe the anatomical basis for the lesions of thalamus, epithalamus and subthalamus such as thalamic pain and thalamic hand	Must know	C3		
			Identify the cross-sectional appearance of thalamus, epithalamus & sub-thalamus	Should know	C3		
			Focus on provision of curative and preventive health care measures	Must know	C3		
			Practice principle of bioethics	Nice to know	C3		
			Analyze the specific input and output projections of major thalamic nuclei to differentiate their distinct roles in sensory relay & motor control.	Nice to know	C4		
			Evaluate distinct clinical presentations such as hemiballismus or contralateral sensory loss to accurately localize focal lesions within the subthalamic nucleus.	Nice to know	C5		
			Construct an integrated anatomical wiring diagram tracing the functional neural circuitry linking the diencephalon (thalamus, subthalamus, epithalamus) with the basal ganglia and cerebral cortex.	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0023	Hypothalamus and 3 rd Ventricle	Identify and describe the functions of tuber cinereum and mamillary bodies	Should know	C2	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Describe the various afferent and efferent connections of hypothalamic nuclei	Should know	C2		
			Describe the anatomical basis for the lesions of hypothalamus and hypothalamic syndromes	Must know	C3		
			Describe the boundaries and relations of the 3rd ventricle	Should know	C2		
			Identify the cross-sectional appearance of hypothalamus	Should know	C3		

			• Focus on provision of curative and preventive health care measures	Must know	C3		
			• Analyze the structural relationship between the third ventricle and the hypothalamus.	Nice to know	C4		
			• Evaluate specific clinical presentations such as severe temperature dysregulation or abnormal appetite to accurately localize focal lesions within distinct hypothalamic nuclei.	Nice to know	C5		
			• Construct a clinico-anatomical map of the third ventricle boundaries to predict the specific structural and hypothalamic consequences of local obstructive hydrocephalus.	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0024	Cortical areas, Layers and Lesions of Cerebrum	• Identify the describe the lobes and subdivisions of cerebrum	Should know	C2	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			• Identify the sulci and gyri of cerebral cortex and describe their functions	Should know	C2		
			• Identify and describe the commissural, association and projection fibers present in the white matter of the brain on cross-sectional studies.	Should know	C2		
			• Discuss the anatomical basis of lesions of internal capsule and alzheimer's disease	Must know	C3		
			• 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	Must know	C3		
			• Discuss the anatomical basis of schizophrenia and frontal lobectomy	Must know	C3		
			• Discuss the basis cerebral dominance, consciousness, persistent vegetative state, sleep and epilepsy.	Must know	C3		
			• Analyze the specific thickness variations of the six neocortical layers across primary motor and sensory cortices.	Nice to know	C4		
			• Evaluate specific higher cortical deficits such as expressive aphasia or contralateral neglect to accurately localize vascular lesions within distinct functional areas of the cerebrum.	Nice to know	C5		

			Construct an integrated clinico-anatomical map correlating specific functional cortical areas with their vascular supply and the classic neurological deficits expected from localized stroke syndromes.	Nice to know		C6			
Physiology (LGIS)	M4-CNS-P-0016	Introduction to motor nervous system &Reflex action	Outline brief introduction of motor nervous system	C 2	Must Know	A	LGIS	MCQ SEQ VIVA	
			Give concept of cortical & subcortical motor control	C 2	Nice to Know	C			
			Briefly explain UMN, LMN, anterior motor neurons & interneurons	C 2	Must Know	A			
			Differentiate between UMN and LMNL	C4	Must Know	A			
			Define reflex action	C 1	Must Know	A			
			Define and draw reflex arc	C 2	Must Know	A			
			Enumerate components of reflex arc	C 1	Should Know	B			
			Classify the reflexes	C4	Must Know	A			
	M4-CNS-P-0017	Conditioned reflexes & properties	Define conditioned reflex	C 2	Must Know	A	LGIS	MCQ SEQ VIVA	
			Enlist and describe properties of conditioned reflexes	C 2	Should Know	B			
			Give examples of conditioned reflex	C 2	Must Know	A			
	M4-CNS-P-0018	Properties of reflex action	Enlist and Explain properties of reflex action	C 2	Should Know	B	LGIS	MCQ SEQ VIVA	
	M4-CNS-P-0019	Control of spinal cord reflexes by higher centers	Compare & contrast spinal animal with decerebrate animal	C4	Must Know	A	LGIS	MCQ SEQ VIVA	
			Describe organization of spinal cord for motor functions	C 2	Must Know	A			
			Explain the concept of cortical & subcortical control.	C 1	Should Know	B			
			Define UMN &LMN						
	M4-CNS-P-0020	Muscle spindle & Golgi tendon organ	Describe muscle spindle & Golgi tendon organ in detail	C 1	Must Know	A	LGIS	MCQ SEQ VIVA	
			Explain the receptor function of the Muscle Spindle &Golgi tendon organ	C 2	Must Know	A			
			Draw muscle spindle and Golgi tendon organ showing the sensory and motor innervation	C 2	Nice To Know	C			
			Distinguish the dynamic and static response of muscle spindle& Golgi tendon organ	C4	Must Know	A			
	M4-CNS-P-0021	Muscle Stretch reflex	Briefly describe muscle stretch reflex	C 2	Should Know	B	LGIS	MCQ SEQ VIVA	
			Draw the neuronal circuitry of the stretch reflex	C 1	Must Know	A			
			Explain the static and dynamic components of stretch reflex	C 2	Should Know	B			
			Discuss the clinical applications of stretch reflex	C 1	Must Know	A			
	M4-CNS-P-0022	Role of muscle spindle and Golgi	Explain negative stretch reflex	C 1	Should Know	B	LGIS	MCQ SEQ VIVA	
			Explain lengthening reaction and its significance	C 2	Must Know	A			

	M4-CNS-P-0023	tendon organ in voluntary motor activity	• Describe role of muscle spindle and Golgi tendon organ in voluntary muscle activity	C 2	Should Know	B	LGIS	MCQ
			• Explain the role of alpha gamma coactivation	C 2	Must Know	A		SEQ VIVA
	M4-CNS-P-0032	Introduction to cerebellum	• Describe physiological anatomy of cerebellum	C 2	Must Know	A	LGIS	MCQ
			• Classify the functional parts of cerebellum & mention their functions	C4	Must Know	A		SEQ VIVA
	M4-CNS-P-0033	Neuronal circuits of cerebellum	• Describe neuronal circuits of cerebellum in detail	C 2	Should Know	B	LGIS	MCQ
			• Enumerate the afferent and efferent pathways	C 1	Must Know	A		
			• Describe the functional unit of cerebellar cortex & deep cerebellar nuclei	C 1	Nice To Know	C		
			• Explain the role of purkinje cell, Deep nuclear cells and inhibitory cells of cerebellum in overall functions of cerebellum	C 2	Must Know	A		
			• Explain role of climbing fibers	C 2	Must Know	A		
			• Discuss the turn-on and turn-off mechanism	C 2	Must Know	A		
	M4-CNS-P-0042	Speech and aphasia (cont.)	• Explain Wernicke's aphasia, Motor aphasia & Global aphasia	C 2	Must Know	A	LGIS	MCQ
			• Describe function of corpus callosum & anterior commissure in transferring information between two cerebral hemispheres	C 2	Must Know	A		
	M4-CNS-P-0043	Learning and memory	• Define memory & classify its various types	C1/C4	Must Know	A	LGIS	MCQ
			• Describe role of synaptic inhibition and synaptic facilitation in memory	C 1	Must Know	A		
			• Explain mechanism of short term, intermediate and long-term memory	C 2	Must Know	A		
			• Describe mechanism of consolidation of memory	C 1	Must Know	A		
			• Enumerate specific parts of brain involved in memory	C 1	Must Know	A		
			• Explain the role of each part	C 2	Must Know	A		
	M4-CNS-P-0046	EEG and epilepsy	• Describe brain waves	C 1	Must Know	A	LGIS	MCQ
			• Classify different types of brainwave	C4	Must Know	A		
			• Explain the origin of different brainwaves	C 2	Should Know	B		
			• Describe EEG	C 2	Must Know	A		
			• Define epilepsy	C 2	Must Know	A		
			• Enumerate various types of epilepsy	C 1	Must Know	A		
	M4-CNS-P-0047	EEG and epilepsy (cont.)	• Classify various types of epilepsy	C4	Should Know	A	LGIS	MCQ
			• Describe role of nor-epinephrine, serotonin and	C 1	Must Know	A		
			• Dopamine in psychotic disorders	C 1	Should Know	B		

			• Describe the causes, symptoms & treatment of depression& bipolar disorder	C 2	Must Know	A		
			• Discuss causes, types, symptoms and treatment of schizophrenia	C 2	Must Know	A		
			• Define Alzheimer’s disease. Mention its causes, clinical features, incidence and treatment	C 2	Must Know	A		
	M4-CNS-P-0048	Reticular activating system and sleep	• Describe activating driving system of the brain	C 2	Must Know	A	LGIS	MCQ SEQ VIVA
			• Explain the reticular activating system	C 1	Must Know	A		
			• Discuss the control of cerebral activity by signals from brain stem	C 2	Should Know	B		
			• Explain neurohormonal system of the brain	C 2	Should Know	B		
			• Define sleep and enumerate types of sleep	C 2	Must Know	A		
			• Compare and contrast between two types of sleep	C4	Must Know	A		
			• Describe the basic theories of sleep in detail	C 2	Must Know	A		
			• Explain physiological effects of sleep	C 2	Must Know	A		
• Describe sleep and wakefulness cycle	C 2	Should Know	B					
Physiology (SGD)	M4-CNS-P-0051	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	C4				
			• 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	C4				
			• Describe organization of spinal cord for motor functions	C1				
			• Explain the concept of cortical & subcortical control.	C2				
			• Define UMN & LMN					
	M4-CNS-P-0052		• Describe physiological anatomy of cerebellum	C1				
			• Classify the functional parts of cerebellum & mention their functions	C4				

		Introduction to cerebellum Neuronal circuits of cerebellum Cerebellum and its motor functions	• Describe neuronal circuits of cerebellum in detail	C1	LGIS	MCQ SEQ VIVA
			• 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		
			• Compare the role of vestibulo cerebellum, spino cerebellum & neocerebellum in overall motor control by cerebellum	C4		
	M4-CNS-P-0053	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		
			• Compare the dynamic and static response of muscle spindle & Golgi tendon organ	C4		
			• 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	LGIS	MCQ SEQ VIVA
			• 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		
			• 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		C4		
			• Explain decorticate rigidity		C2		
			• Briefly explain the pathophysiology of syringomyelia, tabs-dorsalis & poliomyelitis		C2		
Biochemistry (LGIS)	M4-CNS-B-014	Fatty Acid Synthesis	• Explain Basis of fatty acid synthesis • Reframe related clinical disorders • Role play principles of bioethics • Design curative and preventive healthcare measures. • Use HEC digital library	Must Know	C2 C4 C5 C6 C2 C3	LGIS	MCQs, SAQs Viva
	M4-CNS-B-015	Cholesterol Synthesis Hypercholesterolemia	• Describe cholesterol synthesis • Explain Hypercholesterolemia and its types • 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 C2 C6 C3 C2 C3	LGIS	MCQs, SAQs SEQs Viva
Biochemistry (CBL)	M4-CNS-B-016	Respiratory Distress Syndrome	• Illustrate the mechanism by which surfactant deficiency leads to alveolar collapse and impaired gas exchange. • Interpret clinical and radiological findings suggestive of respiratory distress syndrome. • Apply knowledge of fetal lung maturation to explain the increased risk of RDS in premature infants. • Analyze the biochemical role of dipalmitoylphosphatidylcholine (DPPC) in	Must Know	C3 C3 C3 C4 C4	CBL	MCQs SAQs Viva

			reducing alveolar surface tension. • Differentiate respiratory distress syndrome from other causes of neonatal respiratory distress based on clinical and biochemical findings.				
Biochemistry (SDL)	M4-CNS-B-017	Fatty Acid Oxidation	• Apply knowledge of fatty acid oxidation to explain energy production during fasting and prolonged exercise. • Interpret clinical and biochemical findings in patients with defects of fatty acid oxidation. • Apply the β -oxidation pathway to calculate the ATP yield from the oxidation of specific fatty acids. • Use knowledge of the carnitine shuttle to explain the transport of long-chain fatty acids into mitochondria for oxidation. • Apply the principles of fatty acid oxidation to predict metabolic adaptations during starvation.	❖ Reference Book: Lippincott’s Illustrated reviews of Biochemistry 8th Edition Chapter#16, Page 201-204.			
	M4-CNS-B-018	Fatty Liver	• Apply knowledge of lipid metabolism to explain the development of fatty liver in clinical scenarios. • Apply the principles of triglyceride synthesis and transport to explain hepatic fat accumulation. • Use biochemical concepts to correlate insulin resistance with the development of fatty liver. • Apply knowledge of fatty acid metabolism to explain the pathogenesis of non-alcoholic fatty liver disease (NAFLD). • Apply the mechanisms of lipoprotein synthesis and secretion to explain fatty liver resulting from impaired VLDL production.	❖ Reference Book: Lippincott’s Illustrated reviews of Biochemistry 8th Edition Chapter#16, Page 193-197.			
Biochemistry (SKL)	M4-CNS-B-019	Estimation of serum TAGs	• Perform tests to estimate the amount of TAGs in a given serum sample	Must Know	P	Skill Lab	OSPE
Obs & Gynae	M4-CNS-VI(OBG)-001	Seizures during pregnancy(eclampsia/epilepsy)	• Define Eclampsia and epilepsy	C1		LGIS	MCQs
			• Understand the pathophysiology of eclamptic and epileptic fits	C2			

			Differentiate between causes of seizures in pregnancy on the basis of clinical signs and symptoms	C4		
			Plan initial resuscitative measures for management of seizures in pregnancy	C5		
			Discuss maternal and fetal complications	C2		
Surgery	M4-CNS-VI(S)-003	Spinal injury and Head injury	To identify the common causes, clinical features, and initial management principles of spinal injury in trauma patients.	C2	LGIS	MCQs
			To explain the types, warning signs, and basic emergency management of head injury in trauma patients.	C2	LGIS	MCQs
Medicine	M4-CNS-VI(Med)-004	Epilepsy and other convulsive disorders	Define and discuss pathophysiology and discuss symptoms and signs	C1	LGIS	MCQs
			Discuss the causes	C2		
			Describe the management	C2		
	M4-CNS-VI(Med)-003	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

Spiral Courses (3rd Week)

The Pak Studies

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M4-CNS-SI(PKS)-001	The Economic System of Islam	Describe the fundamental principles of the Islamic economic system, including concepts such as justice in trade, prohibition of interest (riba), lawful earnings (halal rizq), and wealth distribution (zakat, sadaqah).	C2	LGIS	MCQs
		Explain how the Islamic economic system promotes social justice, economic equity, and community welfare.	C2	LGIS	MCQs
		Discuss the ethical implications of economic practices in Islam and how they relate to financial integrity and accountability in the medical profession.	C2	LGIS	MCQs
M4-CNS-SI(PKS)-002	In the service of Hazrat Shah Wali Ullah	Identify the life and services of Hazrat Shah Wali Ullah.	C1	LGIS	MCQs
		Explain his contributions to Islamic thought and reform.	C2	LGIS	MCQs

The Islamiyat

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M4-CNS-SI(I)-002	Qualities of Successful People	Define the concept of success in the context of medical education and professional life.	C2	LGIS	MCQs
		Identify key personal attributes such as integrity, perseverance, time management, empathy, and self-awareness that contribute to long-term success in the medical field.	C2		
		Understand qualities like emotional intelligence, leadership, and teamwork influence professional relationships and clinical practice.	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 (C ³ 6) Session – III	Epileptic Seizures, Involuntary Movements & Motor Control Disorders	Anatomy	Cerebrum, cerebral cortex, thalamus, hypothalamus, limbic system, and motor pathways relevant to seizure generation and involuntary movements	• Describe the anatomy of the cerebrum, cerebral cortex, thalamus, hypothalamus, and limbic system in relation to seizure activity.	C3	MCQs
				• Explain the anatomical basis of motor pathways involved in generalized tonic-clonic movements.	C3	MCQs
				• Correlate cortical and subcortical dysfunction with involuntary movements and altered consciousness.	C4	MCQs
		Physiology	EEG and epilepsy, reticular activating system, learning and memory, motor nervous system, and neuronal excitability	• Explain the physiological basis of neuronal excitability and abnormal synchronized discharge in epilepsy.	C3	MCQs
				• Discuss the role of EEG in seizure disorders and correlate electrical activity with clinical manifestations.	C3	MCQs
				• Relate the reticular activating system to alteration of consciousness during and after seizures.	C4	MCQs
		Biochemistry	Metabolic contributors to seizures such as disturbed glucose handling and neuronal energy dependence	• Recognize metabolic factors such as hypoglycemia and disturbed neuronal energy supply as contributors to seizures.	C3	MCQs
				• Correlate basic biochemical disturbances with altered neuronal function in convulsive disorders.	C3	MCQs
		Pathology	Epilepsy, seizure disorders, causes of altered neuronal discharge, and differential diagnosis of convulsions	• Recognize generalized tonic-clonic seizure as an important neurological presentation requiring urgent evaluation.	C3	MCQs
				• Differentiate epilepsy from syncope, febrile convulsions, and psychogenic non-epileptic events on clinical grounds.	C3	MCQs
				• Identify common etiologies and complications of seizure disorders including aspiration, injury, and status epilepticus.	C3	MCQs
		Pharmacology	Introduction to CNS pharmacology and basic principles of antiepileptic drug therapy	• Outline the general principles of immediate supportive care during and after a seizure episode.	C3	MCQs
				• Introduce the role of antiepileptic drugs and the importance of adherence, trigger avoidance, and follow-up.	C3	MCQs

Theme 4: Ataxia, Speech Disturbance & Cranial Nerve Dysfunction (4th Week)

Theme	Rationale	Learning objectives
Ataxia, Speech Disturbance & Cranial Nerve Dysfunction	Topics include cerebellar disease manifestations, cranial nerves I–XII, basal ganglia, pyramidal/extrapyramidal systems and encephalitis. These integrate to produce clinical presentations like dysarthria, diplopia, visual loss, gait imbalance and facial asymmetry.	By the end of this scenario, students should be able to: - Describe the anatomy of the cerebellum, brainstem, cerebellar connections, and cranial nerves involved in coordination, speech, and eye movements. - Explain the physiological role of the cerebellum in posture, balance, coordination, muscle tone, and smooth voluntary movements. - Correlate cerebellar dysfunction with ataxia, intention tremor, dysarthria, nystagmus, diplopia, and gait imbalance. - Differentiate cerebellar ataxia from sensory and vestibular causes of imbalance on clinical grounds. - Recognize red-flag features suggesting posterior fossa or brainstem pathology and outline the need for urgent neuroimaging and referral.
Case Scenario 4: Cerebellar Ataxia with Dysarthria and Cranial Nerve Involvement A 21-year-old male student presented to the outpatient department with progressive unsteadiness while walking, slurring of speech, and intermittent double vision for the last ten days. He stated that the imbalance began gradually as difficulty walking in a straight line and a tendency to sway toward the right side, but over the last few days it became severe enough to interfere with climbing stairs and performing routine activities without support. He also complained of clumsiness of the right hand while buttoning clothes and writing, along with tremulousness that became more obvious during purposeful movement. His family noticed that his speech had become slow, scanning, and unclear. In addition, he described episodes of diplopia and difficulty focusing his gaze, especially when looking laterally. There was no history of recent major trauma, loss of consciousness, or limb weakness. He denied bowel or bladder disturbance. There was no history of hearing loss, but he reported mild occipital headache and occasional nausea. The overall presentation suggested involvement of cerebellar pathways with associated brainstem or cranial nerve dysfunction, requiring careful neurological evaluation. Past Medical History - No known diabetes mellitus or hypertension - History of a febrile upper respiratory illness about two weeks earlier - No previous diagnosed neurological disease Drug History - Occasional use of paracetamol for headache		

- No regular long-term medication

Family History

- No significant family history of stroke or hereditary ataxia

Social History

- University student
- No smoking or alcohol use reported
- Reduced mobility over the last week because of gait imbalance

Examination

General Physical Examination

Patient is conscious and cooperative but walks with broad-based unsteady gait.

Pulse 88/min, BP 122/80 mmHg, Temp 98.9°F, RR 18/min.

Neurological Examination

- Gait: Broad-based gait with swaying toward the right side
- Coordination: Finger-nose test and heel-shin test impaired on the right side; intention tremor present
- Speech: Scanning dysarthria present
- Eyes: Horizontal nystagmus present on lateral gaze; complaint of diplopia
- Cranial nerves: Mild right lateral rectus weakness suggesting sixth cranial nerve involvement
- Tone and power: Normal in all four limbs
- Reflexes: Preserved and symmetrical
- Sensory examination: No objective sensory loss detected

Systemic Examination

CVS, Respiratory, Abdomen: Normal

Educational Relevance (Discipline-wise Integration)

Discipline	Relevance
Anatomy	Cerebellum, cerebellar connections, brainstem, ventricular system, and cranial nerves relevant to ataxia, dysarthria, diplopia, and gaze disturbance
Physiology	Motor control, coordination, cerebellar functions, reflex control, and mechanisms of speech and eye movement
Medicine / Neurology	Clinical approach to ataxia, localizing cerebellar versus brainstem lesions, encephalitis and posterior fossa pathology

Radiology	Role of CT and MRI brain in evaluating posterior fossa lesions, raised ICP, and focal neurological deficits
Pathology	Inflammatory, infective, vascular, and space-occupying lesions affecting the cerebellum and brainstem

Entrustable Professional Activities (EPAs)

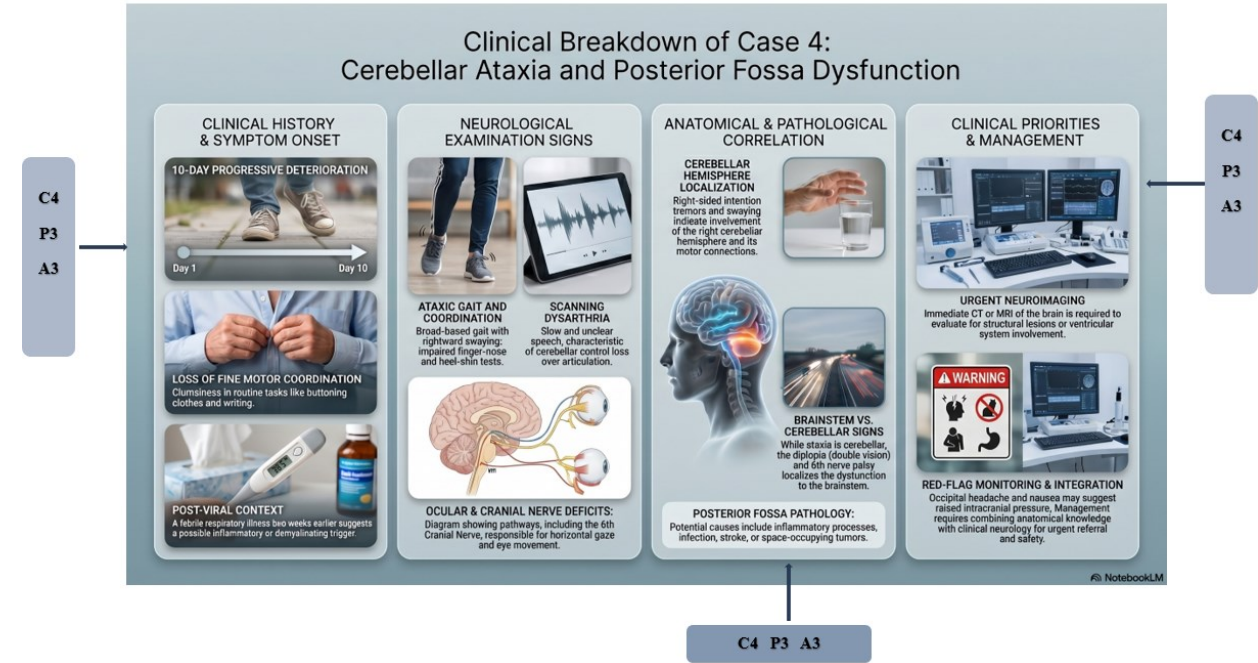
- Obtain a focused neurological history in a patient presenting with gait imbalance, speech disturbance, diplopia, and headache, and identify important red-flag symptoms.
- Perform a structured neurological examination including gait assessment, cerebellar signs, cranial nerve examination, and basic motor-sensory screening.
- Recognize the need for urgent neuroimaging, referral, and counseling in a patient with suspected cerebellar or brainstem pathology.

EPAs Detail Annexure-II

Harden Level 11 Justification

This case represents an authentic patient-care task in which students must integrate anatomy, physiology, pathology, radiology, and clinical reasoning simultaneously to localize a posterior fossa lesion and plan urgent management, reflecting practice-based interdisciplinary learning at Harden Level 11.

Theme 1 Clinico-Concept Connect (C³6)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Subject	Code	Topic	At the End of Lecture Students Should Be Able To	Importance	C/P/A	Teaching Strategy	Assessment Tool
Anatomy Embryology	M4-CNS-A-0010	Embryology Development of Peripheral and Autonomic nervous system	• Describe the development of cranial nerves	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs
			• Describe the development of spinal nerves	Should know	C2		
			• Describe the development of sympathetic nervous system	Should know	C2		
			• Describe the development of parasympathetic nervous system	Should know	C2		
			• Correlate the clinical conditions associated with it	Must know	C3		
			• Analyze the distinct migration pathways of neural crest cells to explain the developmental and functional divergence between sympathetic chain ganglia and the adrenal medulla.	Must know	C4		
			• Evaluate the embryological failure of vagal neural crest cell migration to deduce the anatomical basis and clinical presentation of congenital aganglionic megacolon (Hirschsprung's disease).	Nice to know	C5		
			• Construct a comprehensive embryological blueprint tracing the differentiation of neural crest cells into the complete somatic and visceral sensory/motor pathways of the peripheral nervous system.	Nice to know	C6		
Anatomy Histology	M4-CNS-A-009	Histology Cerebrum	• Describe the histological structure of cerebrum	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs
			• Correlate the clinical conditions associated with it	Must know	C3		
			• Focus on provision of curative and preventive health care measures	Must know	C3		
			• Practice principle of bioethics	Nice to know	C3		
			• Read relevant research article	Nice to know	C3		
			• Analyze the varying thickness of the six neocortical layers to structurally differentiate the primary motor cortex (agranular) from the primary sensory cortex (granular).	Nice to know	C4		
			• Evaluate the distinct cellular populations of the neocortex to justify the functional dominance of pyramidal cells in motor output versus stellate cells in sensory reception.	Nice to know	C5		

			Construct a microscopic wiring diagram mapping the flow of neural impulses from afferent inputs in the internal granular layer to efferent projections from the internal pyramidal layer.	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0024	Lateral Ventricle & CSF	Describe the relations and boundaries of lateral ventricle	Should know	C2	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Describe the formation of choroid plexus in ventricles	Should know	C2		
			Explain the function, production, circulation, and absorption of cerebrospinal fluid	Should know	C2		
			Explain the causes of overproduction and blockage of CSF	Must know	C2		
			Discuss the anatomical basis of various types of hydrocephalus and papilledema.	Must know	C3		
			Discuss the formation and clinical significance of blood brain barrier, blood CSF barrier and CSF Brain interface.	Must know	C3		
			Analyze the specific structural boundaries of the lateral ventricle's individual horns to predict the localized neurological deficits caused by adjacent expanding lesions.	Nice to know	C4		
			Evaluate the anatomical bottlenecks within the cerebrospinal fluid pathway to accurately differentiate the underlying causes of communicating versus non-communicating hydrocephalus.	Nice to know	C5		
			Construct a comprehensive functional map tracing cerebrospinal fluid from its choroidal production to venous absorption	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0026	Cranial nerves I,II,III,IV,VI	Identify the nuclei and connections of CN I,II,III,IV,VI	Should know	C2	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Trace the pathway and perform reflexes associated with of CN I,II,III,IV,VI	Should know	C2		
			Identify the cross-sectional appearance of cranial nerve nuclei	Should know	C3		
			Describe the anatomical basis of lesions of visual pathway and ophthalmoplegias	Must know	C3		
			Focus on provision of curative and preventive health care measures	Must know	C3		
			Practice principle of bioethics	Nice to know	C3		

			Analyze the specific anatomical pathways of cranial nerves I, II, III, IV, and VI to differentiate their distinct structural roles in special sensation and coordinated extraocular movement.	Nice to know	C4			
			Evaluate distinct clinical presentations to accurately localize focal lesions along these specific cranial nerve pathways.	Nice to know	C5			
			Construct an anatomical map tracing these five cranial nerves from their central origins to their peripheral targets	Nice to know	C6			
Gross Anatomy	M4-CNS-A-0027	Cranial nerves V, VII	Identify the nuclei and connections of CN V,VII	Should know	C2	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs	
			Trace the pathway and perform reflexes associated with of CN V,VII	Should know	C2			
			Describe the anatomical basis of upper and lower motor neuron lesion of CN V and trigeminal neuralgia	Must know	C3			
			Identify the cross-sectional appearance of cranial nerve nuclei	Should know	C3			
			Focus on provision of curative and preventive health care measures	Must know	C3			
			Practice principle of bioethics	Nice to know	C3			
			Apply strategic use of AI in health care	Nice to know	C3			
			Analyze the distinct anatomical pathways of the trigeminal and facial nerves to explain their complementary roles in facial sensation, mastication, and expression.	Nice to know	C4			
			Evaluate specific clinical deficits to accurately distinguish between central (UMN) and peripheral (LMN) lesions of these nerves.	Nice to know	C5			
			Construct a comprehensive clinico-anatomical map tracing the motor, sensory, and parasympathetic fibers of cranial nerves V and VII from their brainstem nuclei to their terminal targets.	Nice to know	C6			
Physiology (LGIS)	M4-CNS-P-0024	Polysynaptic reflexes	Classify polysynaptic reflexes	C4	Should Know	B	LGIS	MCQ SEQ VIVA
			Describe the polysynaptic reflexes	C 1	Must Know	A		
			Explain mechanism of reciprocal inhibition and reciprocal innervation	C 2	Must Know	A		
			Enlist and describe reflexes of posture and locomotion	C 1	Must Know	A		

			• Explain scratch reflex	C 1	Must Know	A		
			• Enumerate the spinal cord reflexes that cause muscle spasm	C 2	Should Know	B		
			• Enlist autonomic reflexes in the spinal cord	C 2	Must Know	A		
	M4-CNS-P-0028	Role of brain stem in controlling motor functions	• Enumerate and explain role of brainstem in controlling motor function	C 1	Must Know	A	LGIS	MCQ SEQ VIVA
			• Explain role of pontine & medullary reticular nuclei	C 1	Must Know	A		
			• Briefly write role of vestibular nuclei in antigravity muscle control	C 2	Must Know	A		
			• Summarize decerebrate rigidity	C 2	Must Know	A		
	M4-CNS-P-0029	Lesions of motor system	• Enlist the effects of damage to specialized areas of motor cortex	C 2	Must Know	A	LGIS	MCQ SEQ VIVA
			• Differentiate UMN Lesion and LMN Lesion	C4	Must Know	A		
			• Explain decorticate rigidity	C 1	Must Know	B		
			• Briefly explain the pathophysiology of syringomyelia, tabes- dorsalis &poliomyelitis	C 2	Must Know	A		
	M4-CNS-P-0030	Transection of spinal cord	• Briefly describe transection of spinal cord	C 1	Should Know	B	LGIS	MCQ SEQ VIVA
			• Explain stages of complete transection	C 1	Must Know	A		
	M4-CNS-P-0031	Transection of spinal cord (continued)	• Briefly explain stages of complications in complete transection of spinalcord	C 2	Must Know	A	LGIS	MCQ SEQ VIVA
			• Describe hemi section of spinal cord	C 2	Must Know	A		
			• Explain brown-sequard syndrome	C 2	Must Know	A		
	M4-CNS-P-0034	Cerebellum and its motor functions	• Enlist and explain motor functions of cerebellum	C 2	Must Know	A	LGIS	MCQ SEQ VIVA
			• Compare the role of vestibulo cerebellum, spinocerebellum & neocerebellum in overall motor control by cerebellum	C4	Must Know	A		
	M4-CNSP-0035	Manifestations of cerebellar disease	• Enlist and explain clinical abnormalities of cerebellum	C 2	Should Know	B	LGIS	MCQ SEQ VIVA
Physiology (SGD)	M4-CNS-P-0054	Motor cortex & physiological importance of neocortex Corticospinal or pyramidal tract	• 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		LGIS	MCQ SEQ	
			• Explain transmission of signals from motor cortex to muscle	C2				
			• Draw course of pyramidal tract	C1				

		Extra pyramidal system	• Enlist the functions of pyramidal tract	C1		VIVA
		Basal Ganglia & Lesions	• Mention the effects of lesions in Corticospinal tract	C1		
			• Briefly describe extra pyramidal descending tracts	C1		
			• Differentiate rigidity from spasticity	C4		
			• 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		
Biochemistry (LGIS)	M2-CNS-B-020	Metabolism of Glycerophospholipid and Sphingophospholipid	• Explain the synthesis, degradation, and biological functions of glycerophospholipids and sphingophospholipids in cell membranes.	Should Know	C2	MCQs, SAQs, SEQs, Viva
			• Apply knowledge of glycerophospholipid and sphingophospholipid metabolism to interpret biochemical and clinical manifestations of membrane lipid disorders.		C3	
			• Analyze the metabolic pathways of glycerophospholipids and sphingophospholipids and correlate enzyme deficiencies with associated diseases.		C4	
			• Evaluate the impact of abnormalities in glycerophospholipid and sphingophospholipid metabolism on cellular function and human disease.		C5	
			• Design a diagnostic and management approach for a patient with a disorder of glycerophospholipid or sphingophospholipid metabolism using biochemical and clinical evidence		C6	
		Ketone Body Metabolism	• Explain the synthesis, utilization, and	Must Know	C2	MCQs,

	M2- CNS -B- 021		physiological significance of ketone bodies in human metabolism. • Apply knowledge of ketone body metabolism to explain metabolic adaptations during fasting, starvation, and uncontrolled diabetes mellitus. • Analyze the relationship between fatty acid oxidation, ketogenesis, and ketone body utilization under different metabolic states.		C3 C4		SAQs SEQs Viva
Biochemistry (CBL)	M2-CNS-B-022	Ischemic heart disease	• Illustrate the sequence of events leading from coronary artery occlusion to myocardial ischemia. • Interpret lipid profile findings in patients at risk of ischemic heart disease. • Apply knowledge of myocardial energy metabolism to explain the effects of reduced oxygen supply on cardiac function. • Relate modifiable risk factors such as smoking, diabetes mellitus, obesity, and hyperlipidemia to the development of ischemic heart disease. • Analyze the relationship between dyslipidemia and the progression of coronary atherosclerosis.	Must Know	C3 C3 C3 C4	CBL	MCQs
Biochemistry (SDL)	M2-CNS-B-023	Ketone body metabolism	• Illustrate the pathway of ketone body synthesis from acetyl-CoA in the liver. • Demonstrate the pathway of ketone body utilization (ketolysis) in extrahepatic tissues. • Apply knowledge of ketone body metabolism to explain metabolic adaptations during prolonged fasting. • Analyze the relationship between fatty acid oxidation and ketogenesis during fasting. • Analyze the metabolic consequences of excessive ketone body accumulation in the body.	Must Know	Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#16, Page 214-220		
	M2-CNS-B-024	Cholesterol Metabolism	• Illustrate the pathway of cholesterol synthesis from acetyl-CoA to cholesterol. • Apply knowledge of cholesterol metabolism to explain the effects of fasting, diet, and hormonal regulation on cholesterol levels. • Demonstrate the role of LDL and HDL in	Should Know	Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#18, Page 231-248		

			cholesterol transport and homeostasis. • Predict the metabolic consequences of inhibition of HMG-CoA reductase on cholesterol synthesis.				
Biochemistry (SKL)	M2-CNS-B-025	Estimation of serum HDL	• Understand the clinical significance of estimation of serum HDL • Perform estimation of serum HDL	Must Know Should Know	P	Skill Lab	OSPE
Medicine	M4-CNS-VI(Med)-002	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

Spiral Courses (4th Week)

Behavioral sciences

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M4-CNS-SI(BS)-001	Sleep and Arousal	• Understand the mechanism of sleep and arousal	C1	LGIS	MCQs
		• Elaborate the stages of sleep	C2		
		• Understand the sleep disorders	C3		

The Islamiyat

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M4-CNS-SI(I)-003	Rights of People (Life, Honor, Wealth, etc.)	• Define the fundamental rights of individuals as emphasized in Islamic teachings and ethical frameworks, including the right to life, honor, dignity, property, and freedom.	C2	LGIS	MCQs
		• Explain the importance of respecting the rights of others in personal, academic, and professional settings, particularly in the context of patient care and medical ethics.	C2		MCQs
		• Understand the role of empathy, justice, and accountability in protecting and promoting the rights of patients and colleagues.	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 (C ³ 6) Session – IV	Ataxia, Speech Disturbance & Cranial Nerve Dysfunction	Anatomy	Cerebellum, cerebellar connections, brainstem, ventricular system, and cranial nerves relevant to ataxia, dysarthria, diplopia, and gaze disturbance	• Describe the anatomy of the cerebellum, its hemispheres, vermis, and deep nuclei.	C3	MCQs
				• Explain the anatomical connections of the cerebellum with the brainstem and motor pathways.	C3	MCQs
				• Identify the anatomical course and functional relevance of cranial nerves involved in eye movement and speech-related dysfunction	C3	MCQs
		Physiology	Motor control, coordination, cerebellar functions, reflex control, and mechanisms of speech and eye movement	• Explain the role of the cerebellum in coordination, posture, equilibrium, and muscle tone.	C3	MCQs
				• Relate cerebellar dysfunction to ataxia, intention tremor, nystagmus, and dysarthria.	C3	MCQs
				• Discuss the physiological basis of reflex control and the role of higher centers in maintenance of smooth movement.	C3	MCQs
				• Correlate ocular motor control with brainstem and cranial nerve physiology in diplopia.	C3	
		Medicine	Clinical approach to ataxia, localizing cerebellar versus brainstem lesions, encephalitis and posterior fossa pathology	• Recognize cerebellar ataxia as an important neurological presentation requiring localization and urgent evaluation.	C3	MCQs
				• Differentiate cerebellar ataxia from sensory ataxia and vestibular causes on clinical grounds.	C3	MCQs
				• Identify associated red-flag features such as cranial nerve palsy, headache, vomiting, and worsening gait instability suggestive of posterior fossa pathology.	C3	MCQs
		Radiology	Role of CT and MRI brain in evaluating posterior fossa lesions, raised ICP, and focal neurological deficits	• Recognize the importance of neuroimaging in a patient presenting with ataxia and cranial nerve dysfunction.	C3	MCQs
				• Correlate CT and MRI findings with lesions involving the cerebellum, brainstem, and ventricular system.	C4	MCQs
		Pathology	Inflammatory, infective, vascular, and space-occupying lesions affecting the cerebellum and brainstem	• List major pathological causes of cerebellar and brainstem dysfunction including infection, demyelination, stroke, and tumor.	C3	MCQs
				• Correlate inflammation or space-occupying lesions in the posterior fossa with neurological deficit and raised intracranial pressure.	C4	MCQs

Theme 5: Hemiplegia, Strokes, Neuro-Degeneration & Behavioral Disturbance (5th Week)

Theme	Rationale	Learning objectives
Hemiplegia, Strokes, Neuro-Degeneration & Behavioral Disturbance	Block covers strokes, basal ganglia dysfunction, limbic system, hypothalamus, brain tumours, radiology of CNS, sleep/arousal and psychological responses. These map to real patient complaints: paralysis, memory defects, mood disturbances and personality changes	By the end of this scenario, students should be able to: - Describe the anatomy of the cerebral cortex, internal capsule, corticospinal tract, cranial nerve pathways, basal ganglia, limbic system, and cerebral blood supply. - Explain the physiological basis of voluntary motor control, upper motor neuron signs, speech, memory, behavior, and higher cortical functions. - Recognize acute stroke as a neurological emergency presenting with hemiplegia, facial weakness, aphasia, sensory loss, confusion, and behavioral changes. - Correlate clinical findings with possible lesion localization and differentiate ischemic from hemorrhagic stroke using clinical and radiological assessment. - Outline immediate management priorities, urgent neuroimaging, referral, secondary prevention, rehabilitation needs, and counseling regarding stroke risk factors.
Case Scenario 5: Sudden Hemiplegia with Speech and Behavioral Changes A 66-year-old right-handed male was brought to the Emergency Department with sudden weakness of the right arm and leg, deviation of the mouth to the left side, and difficulty speaking for the last three hours. According to his family, the patient was apparently well in the morning when he suddenly dropped a cup from his right hand and became unable to stand properly. Soon afterward, his speech became slurred and he was unable to express himself clearly. His attendants also noticed that he appeared confused, emotionally labile, and inattentive to people standing on his right side. There was no history of trauma, fever, convulsions, or loss of consciousness. He complained of a severe headache at onset but denied vomiting. Over the last few months, the family had noticed slowing of movement, reduced interest in daily activities, and occasional forgetfulness, but the current episode was abrupt and much more severe. The weakness has persisted without improvement, and the patient is unable to walk or use the affected upper limb. The overall presentation raises strong concern for an acute cerebrovascular event involving the cerebral hemisphere, with associated motor deficit, higher function disturbance, and need for urgent localization and management. Past Medical History - Hypertension for 10 years - Type 2 diabetes mellitus for 6 years - Hyperlipidemia diagnosed two years earlier Drug History		

- Irregular use of antihypertensive medication
- Occasional oral hypoglycemic agents
- No anticoagulant use

Family History

- Father had a history of stroke
- No known hereditary neurodegenerative disorder

Social History

- Retired office worker with sedentary lifestyle
- Smoker for many years
- Poor compliance with diet and regular follow-up

Examination

General Physical Examination (GPE)

Elderly male lying on trolley, conscious but anxious and unable to move the right side properly.

Pulse 94/min, BP 168/96 mmHg, Temp 98.4°F, RR 18/min.

Neurological Examination

- Higher mental functions: Patient appears confused, has expressive aphasia, and shows reduced attention toward the right side
- Cranial nerves: Upper motor neuron type right facial weakness present
- Motor system: Power 1/5 in right upper limb and 2/5 in right lower limb; tone increased on the right side
- Reflexes: Deep tendon reflexes exaggerated on the right side; plantar response extensor on the right
- Sensory system: Decreased appreciation of fine touch and proprioception on the right side
- Gait: Unable to stand or walk without support

Systemic Examination

CVS and Respiratory examination otherwise unremarkable.

Educational Relevance (Discipline-wise Integration)

Discipline	Relevance
Anatomy	Cerebrum, internal capsule, motor cortex, corticospinal tract, basal ganglia, limbic system, and blood supply of the brain relevant to hemiplegia and behavioral disturbance
Physiology	Motor system physiology, reflexes, dominant hemisphere functions, speech, memory, and basal ganglia functions

Medicine / Neurology	Recognition of stroke syndromes, hemiplegia, aphasia, and neurodegenerative manifestations requiring urgent evaluation
Radiology	Role of CT scan and MRI in localization of ischemic or hemorrhagic stroke and associated cerebral lesions
Pathology	Vascular injury, ischemic infarction, hemorrhage, and neurodegenerative processes affecting cognition and behavior
Family Medicine / Prevention	Risk factor control including hypertension, diabetes, smoking cessation, and long-term rehabilitation counseling

Entrustable Professional Activities (EPAs)

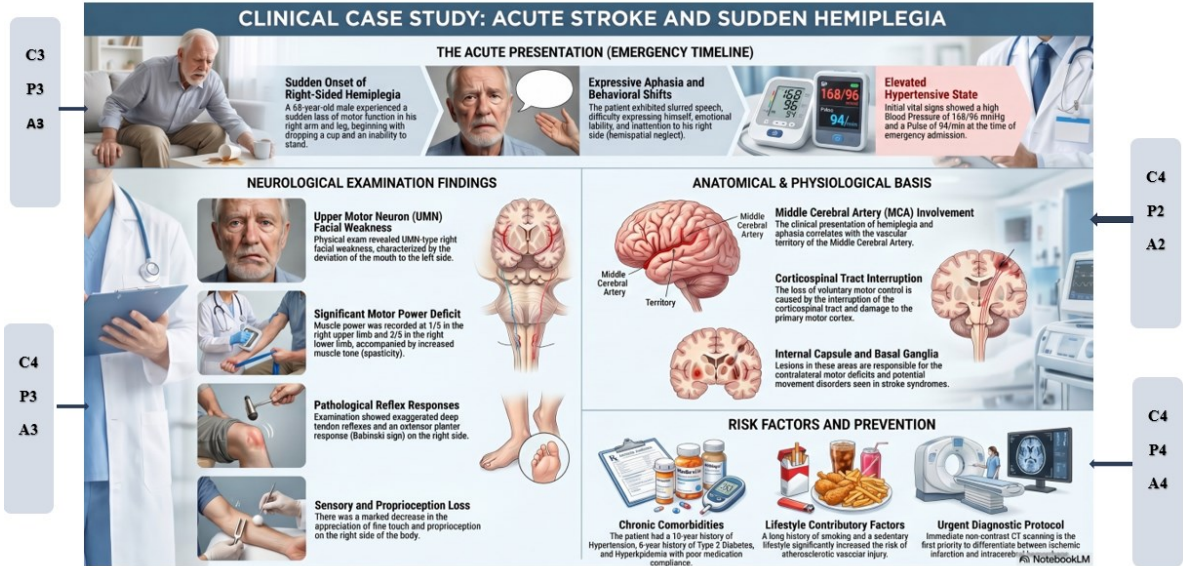
- Obtain a focused history in a patient presenting with sudden hemiplegia, speech difficulty, and behavioral change and identify red-flag features suggestive of acute stroke.
- Perform a structured neurological examination including motor system, cranial nerves, speech assessment, and localization of the lesion.
- Recognize the urgency of stroke management, interpret the need for immediate neuroimaging and referral, and counsel the attendants appropriately.

EPAs Detail Annexure-II

Harden Level 11 Justification

This case represents an authentic patient-care task in which students must integrate anatomy, physiology, pathology, radiology, clinical neurology, and preventive counseling simultaneously to localize the lesion, recognize emergency stroke care, and relate higher function disturbance with structural brain disease, reflecting practice-based integration at Harden Level 11.

Theme 5 Clinico-Concept Connect (C³6)



Harden Level 11 Transdisciplinary

Specific Learning Objectives

Subject	Code	Topic	At the End of Lecture Students Should Be Able To	Importance	C/P/A	Teaching Strategy	Assessment Tool
Anatomy Embryology	M4-CNS-A-0010	Development of Cranium	Identify the distinct embryological tissue origins (neural crest versus paraxial mesoderm) of the neurocranium and viscerocranium.	Should know	C1	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Explain the fundamental anatomical differences between membranous and endochondral ossification during the formation of the cranial vault and base.	Should know	C2		
			Utilize the anatomical positions and normal closure timelines of cranial fontanelles to clinically assess neonatal growth and intracranial pressure.	Should know	C3		
			Analyze the structural interdependence between the physical expansion of the developing brain and the coordinated spatial growth of the overlying membranous neurocranium.	Nice to know	C4		
			Evaluate the specific morphological distortions and potential neurovascular compromises resulting from the premature fusion of cranial sutures.	Nice to know	C5		
			Construct a comprehensive embryological timeline mapping the sequential appearance and fusion of primary ossification centers shaping the complete neonatal skull.	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0029	Basal ganglia	Enlist components of basal ganglia	Should know	C1	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Discuss functions of basal ganglia	Should know	C2		
			Describe the connections of basal ganglia	Should know	C2		
			Discuss the anatomical basis of hypo and hyperkinetic disorders such as chorea, hemiballismus, Parkinson's disease and athetosis.	Must know	C3		
			Identify the cross-sectional appearance of basal ganglia and it's components	Should know	C3		
			Focus on provision of curative and preventive health care measures	Must know	C3		
			Analyze the contrasting anatomical connections of the direct and indirect pathways to explain how the basal	Nice to know	C4		

			ganglia facilitate intended movements while suppressing unwanted ones.				
			Evaluate classic clinical signs of hypokinetic and hyperkinetic movement disorders to accurately localize damage to specific nuclei within the basal ganglia.	Nice to know	C5		
			Construct an integrated functional wiring diagram of the cortico-basal ganglia-thalamic loop to predict the specific motor consequences of focal lesions or neurotransmitter imbalances.	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0030	Limbic system & Reticular formation	Enlist components and connections of limbic system	Should know	C1	SGD	AVOSPE OSVE OSCE MCQs EMQs SEQs
			Discuss functions of limbic system	Should know	C2		
			Describe the connections of limbic system	Should know	C2		
			Enlist components of reticular system	Should know	C1		
			Discuss functions of reticular system	Should know	C2		
			Describe the connections of reticular system	Should know	C1		
			Identify the cross-sectional view of limbic system & reticular formation	Should know	C3		
			Discuss the anatomical basis of loss of consciousness, schizophrenia, Kluver-Bucy syndrome and temporal lobe dysfunction	Must know	C3		
			Analyze the structural pathways of the Papez circuit and the Ascending Reticular Activating System (ARAS) to explain their distinct anatomical roles in memory consolidation and consciousness.	Nice to know	C4		
Gross Anatomy	M4-CNS-A-0031	Blood Supply of Brain and clinicals	Evaluate distinct clinical presentations to accurately localize bilateral damage within the limbic structures or brainstem reticular formation.	Nice to know	C5	SGD	AVOSPE OSVE OSCE MCQs EMQs
			Construct an integrated functional wiring diagram connecting the limbic system with the reticular formation to predict the specific behavioral, autonomic, and arousal deficits resulting from focal lesions.	Nice to know	C6		
			Describe the arterial supply of brain and spinal cord from internal carotid artery and vertebrobasilar systems	Should know	C2		
			Describe the circle of Willis along with its clinical significance	Must know	C2		
			Describe the venous drainage of brain and spinal cord	Should know	C2		

			• Discuss the anatomical basis of signs and symptoms of cerebral vessel occlusions and spinal cord ischemias.	Must know	C3		SEQs
			• Focus on provision of curative and preventive health care measures	Must know	C3		
			• Practice principle of bioethics	Nice to know	C3		
			• Apply strategic use of AI in health care	Nice to know	C3		
			• Analyze the specific perfusion territories of the anterior, middle, and posterior cerebral arteries to explain the distinct motor and sensory deficits of regional ischemic strokes.	Nice to know	C4		
			• Evaluate distinct clinical presentations such as expressive aphasia or isolated contralateral lower limb paralysis to accurately localize an infarction to a specific cerebral vessel.	Nice to know	C5		
			• Construct an integrated clinico-vascular map linking the major cerebral arteries to their functional cortical targets to predict the exact neurological consequences of localized occlusions.	Nice to know	C6		
Gross Anatomy	M4-CNS-A-0032	Radiological Imaging of CNS	• Identify and describe the appearance of different parts of brain in ○ Normal radiographs ○ MRI • CT scan	Must know	C3	Skills lab	AVOSPE OSVE OSCE
			• Identify structures at the section passing through roof of lateral ventricle, bodies of lateral ventricle, apex of squamous part of occipital bone, upper part of squamous temporal bone, midbrain at the level of inferior colliculus, eyeballs, sphenoid sinus and pons, upper part of nasal cavity. • Correlate the knowledge with clinical conditions	Must know	C3 C3		
			• Analyze multi-planar (axial, coronal, sagittal) MR and CT images to accurately trace the normal anatomical relationships and boundaries of major neurovascular structures.	Nice to Know	C4		
			• Evaluate specific differences in tissue radio-density and spatial shifting on an unenhanced head CT to accurately	Nice to Know	C5		

			differentiate between epidural, subdural, and subarachnoid hemorrhages.						
			Construct a comprehensive clinico-radiological report correlating specific structural abnormalities on a neuroimage (e.g., midline shift or ventricular compression) with the patient's expected neurological deficits.	Nice to Know		C6			
Physiology (LGIS)	M4-CNS-P-0025	Motor cortex & physiological importance of neocortex	Classify various areas in cerebral motor cortex	C4	Should Know	B	LGIS	MCQ SEQ VIVA	
			Draw motor & somatic association areas of motor cortex	C 2	Must Know	A			
			Explain functions of motor & somatic association areas	C 1	Should Know	B			
			Explain allocortex &neocortex	C 2	Must Know	A			
			Describe medial and lateral descending pathways	C 1	Must Know	A			
	M4-CNS-P-0026	Corticospinal or pyramidal tract	Explain transmission of signals from motor cortex to muscle	C 1	Must Know	A	LGIS	MCQ SEQ VIVA	
			Draw course of pyramidal tract	C 2	Must Know	A			
			Enlist the functions of pyramidal tract	C 2	Should Know	B			
			Mention the effects of lesions in Corticospinal tract	C 2	Should Know	B			
	M4-CNS-P-0027	Extra pyramidal system	Briefly describe extra pyramidal descending tracts	C 2	Must Know	A	LGIS	MCQ SEQ VIVA	
			Differentiate rigidity from spasticity	C4	Must Know	A			
			Describe location and function of red nucleus	C 2	Must Know	A			
	M4-CNS-P-0036	Basal Ganglia motor functions	Describe physiological anatomy of basal ganglia	C 1	Should Know	B	LGIS	MCQ SEQ VIVA	
			Draw neuronal circuits of basal ganglia	C 1	Must Know	A			
			Explain the role of neuronal circuits in functioning of basal ganglia	C 2	Must Know	A			
			Enlist and explain the physiological role of neurotransmitters in basal ganglia system	C 2	Must Know	A			
	M4-CNS-P-0037	Clinical syndromes resulting from damage to basal ganglia	Enumerate the clinical abnormalities caused by damage to basal ganglia	C 2	Must Know	A	LGIS	MCQ SEQ VIVA	
			Briefly explain Parkinson disease regarding its causes, signs and symptoms & treatment	C 2	Must Know	A			
			Explain Huntington’s Chorea regarding its causes, signs and symptoms	C 1	Must Know	A			
Physiology (SGD)	M4-CNS-P-0055	Limbic system Functions of hypothalamus	Describe the concept of limbic system	C1		SGD	MCQ SEQ VIVA		
			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: ○ Vegetative function ○ Endocrine function Behavioral function • Reward and punishment function		C2		
Biochemistry (LGIS)	M2-CNS-B-020	Metabolism of Glycerophospholipid and Sphingophospholipid	• Illustrate the synthesis of phosphatidylcholine and phosphatidylethanolamine from their precursors. • Demonstrate the pathway of sphingomyelin synthesis from ceramide. • Apply knowledge of phospholipid metabolism to explain the role of dipalmitoylphosphatidylcholine (DPPC) in pulmonary surfactant. • Analyze the role of phospholipases (A₁, A₂, C, and D) in phospholipid metabolism and cell signaling. • Evaluate the significance of glycerophospholipids and sphingophospholipids in maintaining cellular structure and function. • Construct an integrated model demonstrating the relationship between phospholipid metabolism, membrane structure, and cellular signaling.	Must Know	C3 C3 C3 C4 C5 C6	LGIS	MCQs, SAQs Viva
Biochemistry (SGD)	M2-CNS-B-026	Ketone body metabolism	• Interpret laboratory findings (blood glucose, ketones, arterial blood gases) in a patient presenting with ketosis. • Apply knowledge of ketone body metabolism to explain the symptoms of a patient with prolonged fasting. • Analyze the biochemical mechanisms responsible for increased ketone body production in a patient with diabetic ketoacidosis. • Evaluate the contribution of ketone bodies to energy homeostasis during prolonged fasting in a patient	Should Know	C3 C3 C4 C5	SGD	MCQs SAQs Viva

Biochemistry (SDL)	M2-CNS-B-027	Synthesis of cholesterol and its regulation	• Illustrate the pathway of cholesterol synthesis from acetyl-CoA to cholesterol. • Demonstrate the role of HMG-CoA reductase in cholesterol biosynthesis using a metabolic pathway. • Apply knowledge of cholesterol synthesis to explain the effect of fasting and feeding on cholesterol production. • Analyze the regulatory mechanisms controlling HMG-CoA reductase activity at transcriptional, translational, and post-translational levels. • Differentiate between short-term and long-term regulation of cholesterol synthesis.	Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#18, Page 233-239.			
	M2-CNS-B-028	Glycerophospholipid and sphingophospholipid metabolism	• Illustrate the synthesis of phosphatidylcholine and phosphatidylethanolamine from their precursors. • Demonstrate the pathway of sphingomyelin synthesis from ceramide. • Apply knowledge of phospholipid metabolism to explain the role of dipalmitoylphosphatidylcholine (DPPC) in pulmonary surfactant. • Analyze the role of phospholipases (A₁, A₂, C, and D) in phospholipid metabolism and cell signaling. • Evaluate the significance of glycerophospholipids and sphingophospholipids in maintaining cellular structure and function.	Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#17, Page 221-230			
Biochemistry (SKL)	M2-CNS-B-029	Lipid solubility and acrolein test	• Perform test to detect lipid solubility	Should Know	P	Skill Lab	OSPE
Medicine	M4-CNS-VI(Med)-001	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,	C1 C2		LGIS	MCQs

			management			
Radiology	M4-CNS-VI(R)-002	CT scan and MRI (Brain and Spinal Cord)	• Interpret normal anatomical structures	C2	LGIS	MCQs
			• List some indications for contrast enhanced MRI and CT	C1		
			• Discriminate between a subdural and epidural hematoma at CT (4) Describe imaging signs of a subarachnoid hemorrhage	C2		
Surgery	M4-CNS-VI(S)-001	Brain Tumors & Brain Abscess	• Classify Brain Tumors	C1	LGIS	MCQs
			• Outline clinical features of brain tumors. • Approach towards a SOL brain	C1		
Gynae & Obs	M4-CNS-VI(OBG)-002	Psychiatric Disorders in Pregnancy (Postpartum Blues Depression Psychosis)	• Define psychiatric disorders in pregnancy	C1	LGIS	MCQs
			• The pathophysiology of postpartum affective disorders	C2		
			• The normal emotional and psychological changes during pregnancy	C2		
			• Management of postpartum depression and psychosis	C3		
			• Differentiate between postpartum blues and pinks	C4		

Spiral Courses (5th 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
M4-CNS-SI(FMed)-001	Approach to a patient with headache	• Describe presenting complains of patients with Headache	C3	LGIS-1	MCQs
		• Discuss complications of Headache			
		• Describe initial treatment of patients with Headache			
		• Know when to refer patient to consultant/ Hospital			

Behavioral sciences

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M4-CNS-SI(BS)-002	Defense Mechanism	• Understand the healthy and unhealthy defense mechanisms	C3	LGIS	MCQs
		• Elaborate various defense mechanisms	C3		

The Pak Studies

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M4-CNS-SI(PKS)-004	Protection of Minorities	• Describe the Islamic principles regarding the protection of minorities, including respect for religious freedom, protection of life and property, and the prohibition of discrimination.	C2	LGIS	MCQs
		• Explain the historical examples from the life of the Prophet Muhammad (PBUH) and early Islamic governance that illustrate fair treatment of non-Muslims and minority communities.	C2	LGIS	MCQs

The Islamiyat

Code	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M4-CNS-SI(I)-004	Women's Rights	Explain the concept of women's rights within the broader framework of human rights and gender equality.	C2	LGIS	MCQs
		Describe the historical development of women's rights movements at the national, regional, and global levels.	C2		
		Identify and analyze major international conventions, declarations, and legal frameworks related to women's rights, including their significance and implementation.	C2	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 (C ³ 6) Session – V	Hemiplegia, Strokes, Neuro-Degeneration & Behavioral Disturbance	Anatomy	Cerebrum, internal capsule, motor cortex, corticospinal tract, basal ganglia, limbic system, and blood supply of the brain relevant to hemiplegia and behavioral disturbance	• Describe the anatomy of the cerebral hemispheres, motor cortex, internal capsule, and corticospinal tract.	C3	MCQs
				• Explain the vascular supply of the brain, especially the middle cerebral artery, and correlate it with hemiplegia and aphasia.	C3	MCQs
				• Identify the anatomical basis of upper motor neuron facial weakness and contralateral motor deficit.	C3	MCQs
				• Correlate basal ganglia and limbic system anatomy with movement disorder and behavioral changes.	C4	MCQs
		Physiology	Motor system physiology, reflexes, dominant hemisphere functions, speech, memory, and basal ganglia functions	• Explain the physiology of voluntary motor control and the effects of corticospinal tract interruption.	C3	MCQs
				• Relate exaggerated reflexes, increased tone, and extensor plantar response to upper motor neuron lesions.	C4	MCQs
				• Discuss the physiological basis of speech, dominant hemisphere function, memory, and behavior.	C3	MCQs
		Medicine	Recognition of stroke syndromes, hemiplegia, aphasia, and neurodegenerative manifestations requiring urgent evaluation	• Recognize acute stroke as a neurological emergency requiring urgent assessment and referral.	C4	MCQs
				• Differentiate ischemic stroke from hemorrhagic stroke on clinical and radiological grounds.	C3	MCQs
				• Identify common presentations such as hemiplegia, aphasia, facial weakness, and altered behavior.	C3	MCQs
				• Outline immediate management priorities and the importance of time-sensitive intervention in stroke.	C4	MCQs
		Radiology	Role of CT scan and MRI in localization of ischemic or hemorrhagic stroke and associated cerebral lesions	• Recognize the role of non-contrast CT scan in early assessment of suspected stroke.	C3	MCQs
				• Correlate MRI findings with infarction, hemorrhage, and structural lesions affecting higher functions.	C4	MCQs
				• Relate radiological localization to the patient’s neurological deficits.	C3	MCQs
		Pathology	Vascular injury, ischemic infarction, hemorrhage, and	• Explain the pathological basis of cerebral infarction and intracerebral hemorrhage.	C3	MCQs

			neurodegenerative processes affecting cognition and behavior	• Discuss the contribution of atherosclerosis, hypertension, and diabetes to cerebrovascular disease.	C3	MCQs
				• Identify major pathological causes of progressive neurodegeneration associated with motor and behavioral decline.	C3	MCQs
		Family Medicine	Risk factor control including hypertension, diabetes, smoking cessation, and long-term rehabilitation counseling	• Discuss modifiable risk factors for stroke including hypertension, diabetes, smoking, dyslipidemia, and sedentary lifestyle.	C3	MCQs
				• Counsel patients and families regarding secondary prevention, drug compliance, and rehabilitation needs.	C4	MCQs
				• Emphasize early recognition of warning signs of stroke and immediate hospital presentation.	C5	MCQs

Anatomy LGIS Syllabus of Learning Management System (LMS)

Code	Topic	At the End of The Session Student Should Be Able To	Importance	C/P/A	Teaching Strategy	Assessment Tool	References
M4-CNS-A-0048	General Anatomy Nervous System	• Discuss the major divisions of nervous system	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	- General Anatomy by Tassaduq Hussain 19th edition - USMLE Q Bank Step 1 (Volume 1) 2023-2024 - UWORLD Step 1 (Volume 3) 2023-2024
		• Differentiate between neurons and neuroglia	Should know	C2			
		• List the neuroglia and their functions	Should know	C1			
		• Describe myelination of nerve fibers	Should know	C2			
		• Describe the structure of a peripheral nerve and reflex action	Should know	C2			
		• Describe degeneration and regeneration of nerves	Must know	C2			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle 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			
M4-CNS-A-0049	Embryology Early development of Skull & Central Nervous System	• Describe the process of development of neurocranium and viscerocranium	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	- KLM Embryology Developing Human - USMLE Q Bank Step 1 (Volume 1) 2023-2024 - UWORLD Step 1 (Volume 3) 2023-2024
		• Describe formation of neural tube, neuropores and their closure	Should know	C2			
		• Describe histogenesis and Cytodifferentiation within the neural tube.	Should know	C2			
		• Describe the brain flexures and their derivatives	Should know	C2			
		• Describe role of neuroblasts forming efferent and afferent rows.	Should know	C2			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle 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			
M4-CNS-A-0050	Embryology Development of spinal cord	• Describe the significance of ventricular, mantle and marginal layers of developing spinal cord.	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	• KLM Embryology Developing Human • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Enumerate derivatives of alar and basal plates in developing spinal cord	Should know	C1			
		• Describe the process of myelination of nerve fibres.	Should know	C2			
		• Describe role of neural crest cells in development of spinal ganglia.	Should know	C2			
		• Explain positional changes of spinal cord	Should know	C2			
		• Discuss congenital anomalies due to neural tube defects and abnormal histogenesis	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle 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			
M4-CNS-A-0051	General Anatomy Autonomic Nervous System	• Enlist the components of peripheral and autonomic nervous system	Should know	C1	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	• General Anatomy by Tassaduq Hussain 19th edition • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Tabulate differences between sympathetic and parasympathetic nervous system	Should know	C2			
		• Describe effects of sympathetic and parasympathetic nervous system on various parts of the body	Should know	C2			
		• Discuss the anatomical basis of autonomic injuries such as Horner's syndrome, Urinary bladder dysfunction, Rectal distention, Erectile dysfunction and Argyll Robertson pupil.	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			

		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0052	Histology Meninges, Choroid Plexus Peripheral Nervous System and Ganglia	• Describe the histological structure of meninges and choroid plexus	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	- Junqueira's Basic Histology 18th Edition - USMLE Q Bank Step 1 (Volume 1) 2023-2024 - UWORLD Step 1 (Volume 3) 2023-2024
		• Discuss the histological structure of myelinated and unmyelinated nerve fibres.	Should know	C2			
		• Discuss the histological structure of sensory and autonomic ganglia	Should know	C2			
		• Discuss the principles of neuroplasticity and regeneration	Must know	C2			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0053	Embryology Development of Rhombencephalon	• Describe the development of Myelencephalon	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	- KLM Embryology Developing Human - USMLE Q Bank Step 1 (Volume 1) 2023-2024 - UWORLD Step 1 (Volume 3) 2023-2024
		• Describe the arrangement of neuroblasts in Metencephalon	Should know	C2			
		• Describe the development of Metencephalon	Should know	C2			
		• Describe the arrangement of neuroblasts in Metencephalon	Should know	C2			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0054	Histology Spinal cord and Cerebellum	• Describe the histological structure of spinal cord	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	- Junqueira's Basic Histology 18th Edition - USMLE Q Bank Step 1 (Volume 1) 2023-2024
		• Describe the histological structure of cerebellum	Should know	C2			
		• Discuss cells in each layer along with its histological morphology	Should know	C2			

		• Illustrate the cross-sectional view of spinal cord and cerebellum	Should know	C3			• UWORLD Step 1 (Volume 3) 2023-2024
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0055	Embryology Development of Mesencephalon and Prosencephalon	• Describe the development of Mesencephalon	Should know	C2			• KLM Embryology Developing Human
		• Describe the arrangement of neuroblasts in mesencephalon	Should know	C2			• USMLE Q Bank Step 1 (Volume 1) 2023-2024
		• Describe the development of pituitary gland	Should know	C2			• UWORLD Step 1 (Volume 3) 2023-2024
		• Discuss the anatomical basis of pharyngeal hypophysis and craniopharyngiomas	Must know	C3			
		• Discuss the anatomical basis of birth defects such as encephalocele, microencephaly, Arnold Chiari malformation	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0056	Histology Cerebrum	• Describe the histological structure of cerebrum	Should know	C2			• Junqueira's Basic Histology 18th Edition
		• Correlate the clinical conditions associated with it	Must know	C3			• USMLE Q Bank Step 1 (Volume 1) 2023-2024
		• Focus on provision of curative and preventive health care measures	Must know	C3			• UWORLD Step 1 (Volume 3) 2023-2024
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0057	Embryology	• Describe the development of cranial nerves	Should know	C2			

	Development of Peripheral and Autonomic nervous system	• Describe the development of spinal nerves	Should know	C2		OSCE MCQs EMQs SEQs	• KLM Embryology Developing Human • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Describe the development of sympathetic nervous system	Should know	C2			
		• Describe the development of parasympathetic nervous system	Should know	C2			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			

Anatomy SGD Syllabus of Learning Management System (LMS)

Code	Topic	At the End of The Session Student Should Be Able To	Importance	C/P/A	Teaching Strategy	Assessment Tool	References
M4-CNS-A-0058	General Anatomy Nervous System	• Discuss the major divisions of nervous system	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	• General Anatomy by Tassaduq Hussain 19th edition • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Differentiate between neurons and neuroglia	Should know	C2			
		• List the neuroglia and their functions	Should know	C1			
		• Describe myelination of nerve fibers	Should know	C2			
		• Describe the structure of a peripheral nerve and reflex action	Should know	C2			
		• Describe degeneration and regeneration of nerves	Must know	C2			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle 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			
M4-CNS-A-0059	Embryology	• Describe the process of development of neurocranium and viscerocranium	Should know	C2	LGIS	AVOSPE OSVE	

	Early development of Skull & Central Nervous System	• Describe formation of neural tube, neuropores and their closure	Should know	C2		OSCE MCQs EMQs SEQs	• KLM Embryology Developing Human • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Describe histogenesis and Cytodifferentiation within the neural tube.	Should know	C2			
		• Describe the brain flexures and their derivatives	Should know	C2			
		• Describe role of neuroblasts forming efferent and afferent rows.	Should know	C2			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle 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			
M4-CNS-A-0060	Embryology Development of spinal cord	• Describe the significance of ventricular, mantle and marginal layers of developing spinal cord.	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	• KLM Embryology Developing Human • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Enumerate derivatives of alar and basal plates in developing spinal cord	Should know	C1			
		• Describe the process of myelination of nerve fibres.	Should know	C2			
		• Describe role of neural crest cells in development of spinal ganglia.	Should know	C2			
		• Explain positional changes of spinal cord	Should know	C2			
		• Discuss congenital anomalies due to neural tube defects and abnormal histogenesis	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle 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			
M4-CNS-A-0061	General Anatomy	• Enlist the components of peripheral and autonomic nervous system	Should know	C1	LGIS	AVOSPE OSVE	

	Autonomic Nervous System	• Tabulate differences between sympathetic and parasympathetic nervous system	Should know	C2		OSCE MCQs EMQs SEQs	- General Anatomy by Tassaduq Hussain 19th edition - USMLE Q Bank Step 1 (Volume 1) 2023-2024 - UWORLD Step 1 (Volume 3) 2023-2024
		• Describe effects of sympathetic and parasympathetic nervous system on various parts of the body	Should know	C2			
		• Discuss the anatomical basis of autonomic injuries such as Horner's syndrome, Urinary bladder dysfunction, Rectal distention, Erectile dysfunction and Argyll Robertson pupil.	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0062	Histology Meninges, Choroid Plexus Peripheral Nervous System and Ganglia	• Describe the histological structure of meninges and choroid plexus	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	- Junqueira's Basic Histology 18th Edition - USMLE Q Bank Step 1 (Volume 1) 2023-2024 - UWORLD Step 1 (Volume 3) 2023-2024
		• Discuss the histological structure of myelinated and unmyelinated nerve fibres.	Should know	C2			
		• Discuss the histological structure of sensory and autonomic ganglia	Should know	C2			
		• Discuss the principles of neuroplasticity and regeneration	Must know	C2			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0063	Embryology Development of Rhombencephalon	• Describe the development of Myelencephalon	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	- KLM Embryology Developing Human - USMLE Q Bank Step 1 (Volume 1) 2023-2024
		• Describe the arrangement of neuroblasts in Metencephalon	Should know	C2			
		• Describe the development of Metencephalon	Should know	C2			

		• Describe the arrangement of neuroblasts in Metencephalon	Should know	C2			UWORLD Step 1 (Volume 3) 2023-2024
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0064	Histology Spinal cord and Cerebellum	• Describe the histological structure of spinal cord	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	• Junqueira's Basic Histology 18th Edition • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Describe the histological structure of cerebellum	Should know	C2			
		• Discuss cells in each layer along with its histological morphology	Should know	C2			
		• Illustrate the cross-sectional view of spinal cord and cerebellum	Should know	C3			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0065	Embryology Development of Mesencephalon and Prosencephalon	• Describe the development of Mesencephalon	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	• KLM Embryology Developing Human • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Describe the arrangement of neuroblasts in mesencephalon	Should know	C2			
		• Describe the development of pituitary gland	Should know	C2			
		• Discuss the anatomical basis of pharyngeal hypophysis and craniopharyngiomas	Must know	C3			
		• Discuss the anatomical basis of birth defects such as encephalocele, microencephaly, Arnold Chiari malformation	Must know	C3			

		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0066	Histology Cerebrum	• Describe the histological structure of cerebrum	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	• Junqueira's Basic Histology 18th Edition • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			
M4-CNS-A-0067	Embryology Development of Peripheral and Autonomic nervous system	• Describe the development of cranial nerves	Should know	C2	LGIS	AVOSPE OSVE OSCE MCQs EMQs SEQs	• KLM Embryology Developing Human • USMLE Q Bank Step 1 (Volume 1) 2023-2024 • UWORLD Step 1 (Volume 3) 2023-2024
		• Describe the development of spinal nerves	Should know	C2			
		• Describe the development of sympathetic nervous system	Should know	C2			
		• Describe the development of parasympathetic nervous system	Should know	C2			
		• Correlate the clinical conditions associated with it	Must know	C3			
		• Focus on provision of curative and preventive health care measures	Must know	C3			
		• Practice principle of bioethics	Nice to know	C3			
		• Read relevant research article	Nice to know	C3			

Anatomy SKL Syllabus of Learning Management System (SKL)

Code	Practical	At The End Of This Skill Lab, Should Be Able To Illustrate:	Calgary Gauge	Learning Domain	References
M4-CNS-A-0068	Ganglia	• Identify the microscopic features of ganglia	Must know	P	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 histological picture of ganglia	Should know	C2	
		• List two points of identification	Must know	C1	
M4-CNS-A-0069	Peripheral Nerve	• Identify the microscopic features of peripheral nerve on given histological slide	Must know	P	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 histological picture of peripheral nerve	Should know	C2	
		• List two points of identification	Must know	C1	
M4-CNS-A-0070	Spinal Cord	• Identify histological slide of spinal cord	Must know	P	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 histological picture of spinal cord	Should know	C2	
		• List two points of identification	Must know	C1	
M4-CNS-A-0071	Cerebellum	• Identify the microscopic features of cerebellum	Must know	P	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 histological picture of cerebellum	Should know	C2	
		• List two points of identification	Must know	C1	

Physiology Syllabus of Learning Management System (LMS)

Code	Topics	Learning Objectives	Calgary Model
M4-CNS-P-0078	Organization of nervous system, Mechanism of synaptic transmission	- Describe the general organization of nervous system - Describe major levels of CNS functions - Briefly explain nerve fiber structure, classification & properties - Describe labeled line principle - Define synapse - Enumerate & compare types of synapses - Describe process of synaptic transmission - Enumerate the important neurotransmitters of nervous system	Should know
M4-CNS-P-0079	Classification of sensory receptors, Properties of sensory receptors	- Enumerate & explain different types of sensory receptors according to function - Enumerate & explain different types of sensory receptors according to location - Enlist various properties of sensory receptors - Describe mechanism of signal transduction & generation of receptor potential - Describe mechanism of adaptation of different types of receptors - Describe the properties of sensory receptors - Describe the types and characteristics of tactile receptors	Should know
M4-CNS-P-0080	Properties of synaptic transmission	- Briefly explain the electrical events during neuronal excitation and inhibition - Explain temporal and spatial summation - Enlist & explain various characteristics of synaptic transmission	Nice to know
M4-CNS-P-0081	Physiology of pain, Dual pathway for transmission of pain, Analgesia System and Thermal sensations	- Define pain - Enumerate different types of pain - Tabulate the differences between two types of pain - Describe characteristics of pain receptors - Discuss the mechanism of stimulation of pain receptors - Compare and contrast neospinothalamic & paleospinothalamic tract - Define referred pain - Explain the mechanism of referred pain - Give examples of referred pain - Describe visceral pain and its causes - Define headache - Enlist the types of headache & their causes	Nice to know

		• Explain the analgesia system • Describe thermal receptors • Explain mechanism of excitation of thermal receptors • Describe transmission of thermal signals in nervous system	
M4-CNS-P-0082	Sensory 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	Nice to know
M4-CNS-P-0083	Introduction to autonomic nervous system Basic Characteristics of sympathetic & parasympathetic function	• 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	Must Know/ Should know
M4-CNS-P-0084	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	Must Know/ Should know
M4-CNS-P-0085	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	Must Know/ Should know
M4-CNS-P-0086	CSF, Blood brain barrier, Blood CSF Barrier, Lumber puncture	• Describe briefly the physiological anatomy of cerebral blood flow • Explain cerebrospinal fluids system • Describe the CSF pressure, its measurement by lumbar puncture, &hydrocephalus • Explain blood CSF barrier & BBB • Describe brain edema	Nice to know

M4-CNS-P-0087	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 parieto-occipito temporal cortex in non-dominant hemisphere	Must Know/ Should know
M4-CNS-P-0088	Limbic system, Functions of hypothalamus	• Describe the concept of limbic system • Describe physiological anatomy of limbic system • Enumerate and explain the roles of hippocampus, amygdale and limbic cortex • Describe physiological anatomy of hypothalamus • Enlist functions of hypothalamus • Explain role of hypothalamus in: • Vegetative function • Endocrine function • Behavioral function • Reward and punishment function	Nice to know
M4-CNS-P-0089	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	Must Know/ Should know
M4-CNS-P-0090	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	Should know
M4-CNS-P-0091	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	Nice to know

Case Based Learning Objectives (CBL)

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

SECTION – IV

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

Assessment

RMU – 12 Assessment Framework of Integrated Modular MBBS Curriculum 2026

Isolation to **Beyond Boundaries**

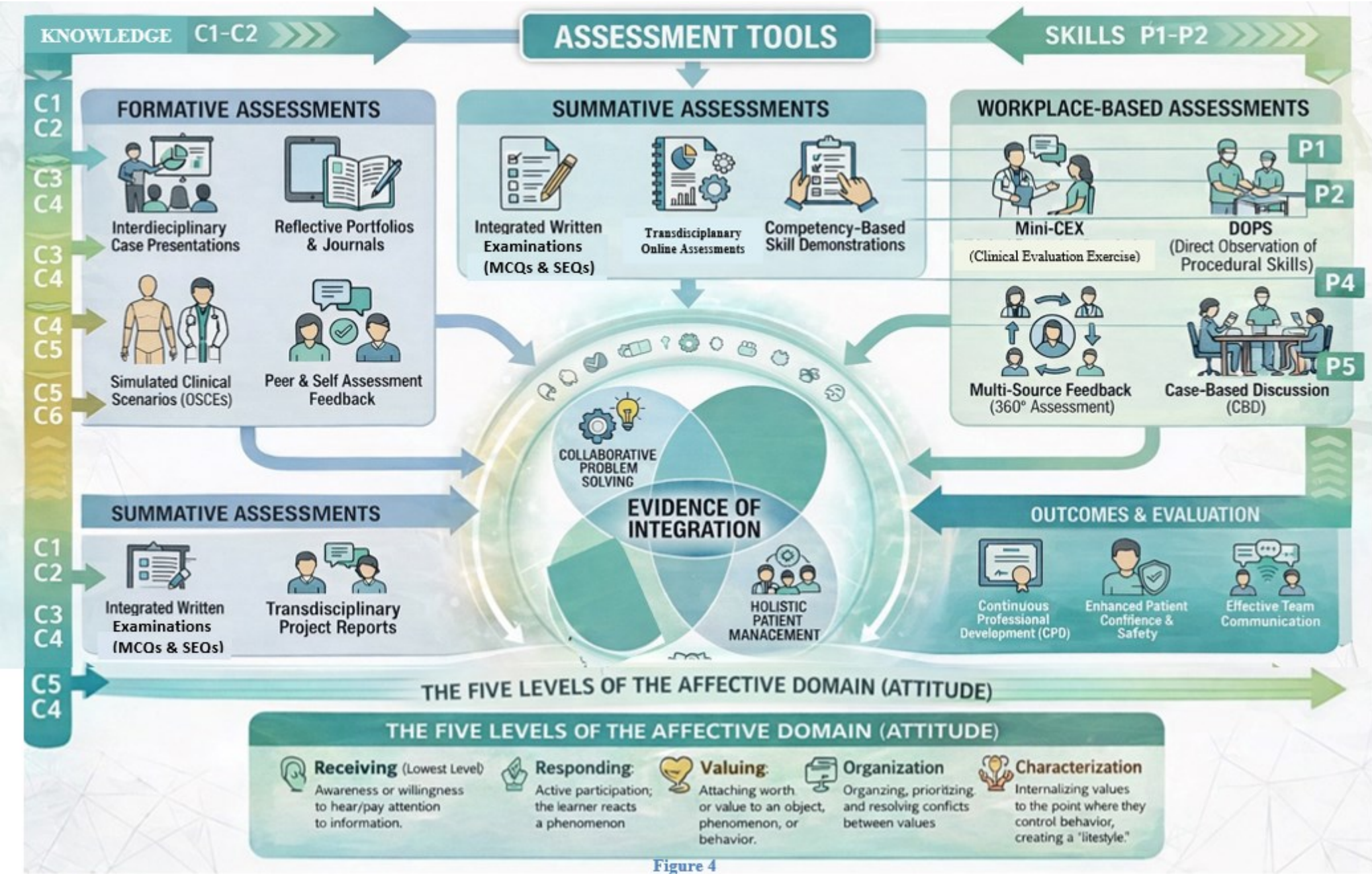


Figure 4

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 assessment instrument must be selected based on its utility index.
- Feedback, ensuring that the feedback loop is closed, should be provided to students following all assessments to ensure that students identify gaps in their learning and faculty can review future curricular and assessment content.
- The quality of the entire assessment including confidentiality of the assessment process must be ensured.
- The assessment process should be clear and transparent so that students know in advance the expectations (from students) and consequences of the assessment.
- Details of the conduct of examinations are available in the Examination policy document.

2. Purposes of Assessment.

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

3. Forms of assessments

3.1 Formative Assessment

A formative assessment refers to a low-stakes assessment that does not normally contribute towards a student's final grade. Assessment for learning is carried out throughout modules and clerkships using various strategies (at the discretion of module coordinators and clerkship directors' feedback. 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 Assessment of 30 MCQs (10 MCQs per Subject)																																		

Block	Subjects	LMS Based Assessment					OSPE						Grand Total	Total Block Time
							MCQs					LabOSPE			IOSPE	COSPE	Total	Marks	Time
		C	HV	S	Total	Time	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													

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

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

3.2.4 Continuous Internal Assessment (CIA)

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

Break up of internal assessment is as follows:

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 skills There will be no change in calculated internal assessment scores for supplementary University examination.

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 Assessment s	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 Ophthalmology Otorhinolaryngology	14 %	115 Marks
	Early Clinical Exposure (ECE)	1%	5 Marks
	ALPHA(Artificial Intelligence, Leadership, Professionalism, Humanities & Arts) GEC (General Education Cluster)	1%	5 Marks
	Total Marks		845 Marks

Notes:

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

A - Blockwise Distribution of Marks

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

285 Marks	Family Medicine	3 Marks			
	Orthopedics	3 Marks			
	Radiology	3 Marks			
	Medicine	3 Marks			
	Gynae & Obs	3 Marks			
	Behavioural Sciences	4 Marks			
	Pathology	2 Marks			
	ECE		5 Marks		
	ALPHA and GEC		5 Marks		
Total		240+ 45 = 285 marks			
marks					

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

Block	Subjects	Theory (Knowledge)	Practical (Skill/attitude)	Total marks	Total marks (Core subjects + Integrated Subjects)
Block VI Total marks (Core subjects + Integrated Subjects) 275 Marks	Anatomy	50	30	80 marks	240+35 = 275 marks
	Physiology	50	30	80 marks	
	Biochemistry	50	30	80 marks	
	Total			240 marks	
	Integrated Subjects			35 Marks	
	Community Medicine	2 Marks			
	Behavioural Sciences	2Marks			
	Medicine	3 Marks			
	Family medicine	3 Marks			
	Gynae & Obs	2 Marks			
	Radiology	2 Marks			
	Pediatrics	2 Marks			
	Otorhinolaryngology	3 Marks			
	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)			Total time required for Block – II pre-annual assessment is
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	

Total number of questions	110	6	3	3	9	3	8	8 hrs and 25 minutes
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 = 600*

- Block I Assessment Total Marks = 300
- Block II Assessment Total Marks = 300
- Block III Assessment Total Marks = 300

b. Second Professional Examination- 1000 Marks*

- Block I Assessment Total Marks = 300
- Block II Assessment Total Marks = 300
- 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 carries 15 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	
Block VI 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
Block V	Module 1	200	200	200	600
	Module 2	200	200	200	600

1470 Marks	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 • Ophthalmology • 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			29 Marks	
	Communit y Medicine /Research	4 Marks			
	Family Medicine	1 Marks			
	Orthopedics	2 Marks			

210 Marks	• Radiology	2 Marks			
	• Medicine	3 Marks			

	Gynae C Obs	1 Marks			
	Behavioural Sciences	4 Marks			
	Pathology	2 Marks			
	ECE		5 Marks		
	ALPHA and GEC		5 Marks		
Total marks		181+29 = 210 marks			
Block	Subjects	Theory	Practical	Total marks	Total marks Core Subject + Integrated Subjects
Block VI 					

E: Block Wise Distribution of Marks for Second Year MBBS (Batch 52) (Annual Professional Marks + CIA)

Subject	Theory			Practical			Total Marks
Block IV (GIT / Renal) Total Annual marks=210	Component	No of Items	Marks	Component	No of Items	Marks	210
	Section I- MCQ	75	75	LabOSPE	5	25	
	Section II- SEQ	6	30	iOSPE	3	15	
			OSCE	4	20		
			OSVE	3	45		
CIA =90 Marks	Continuous Internal Assessment (30%)		45	Continuous Internal Assessment (30%)		45	90
Total Annual marks+ CIA =210+90= 300	Total Marks		150	Total Marks		150	300
Block V (Reproduction, CNS) Total Annual marks=210	Section I- MCQ	75	75	LabOSPE	5	25	210
	Section II- SEQ	6	30	iOSPE	3	15	
			OSCE	4	20		
			OSVE	3	45		
	CIA =90 Marks		Continuous Internal Assessment (30%)		45	Continuous Internal Assessment (30%)		45	90
Total Annual marks+ CIA =210+90= 300	Total Marks		150	Total Marks		150	300
Block VI (Special Senses, Endocrinology) Total Annual marks=210	Section I- MCQ	75	75	LabOSPE	4	20	210
	Section II- SEQ	6	30	iOSPE	3	15	
			OSCE	5	25		
			OSVE	3	45		
	CIA = G0 Marks		Continuous Internal Assessment (30%)		45	Continuous Internal Assessment (30%)		45	90
Total Annual marks + CIA =210+G0= 300	Total Marks		150	Total Marks		150	300
Grand Total Marks							G00

F: 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	
	ECE	-	-	-		-	-	1	-	5	5	5	
Spirally Integrated Subjects	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	%
Core s Horizontally Integrated Subjects	Anatomy C Applied /Clinical	23	3	38	3	1	1	1	40	78	37
	Physiology C Applied/Clinical	24	2	29	1	1	1	1	30	64	30
	Biochemistry C Applied/clinical	9	1	14	1	1	-	1	25	39	18
Vertically Integrated Subjects	Community Medicine C Public Health	4	-	4	-	-	-	-	-	4	15
	Behavioural Sciences	4	-	4	-	-	-	-	-	4	
	Pathology	2	-	2	-	-	-	-	-	2	
	Family Medicine	1								1	
	Orthopedics	2								2	
	Radiology	2								2	
	Medicine	3								3	
	Gynae C Obs	1								1	
Spirally Integrated Subjects	ECE	-	-	-	-	-	1	-	5	5	
	ALPHA and GEC	-	-	-	-	-	1	-	5	5	
Total		75	6x5=30	105	5x5=25	3x5=15	4x5=20	3x15=45	105	210	100
Total		105			105				105+105=210		

H: 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	
	Ophthalmology	1		1						1	
	Pathology	2		2						2	
	Pharmacology	1	-	1	-	-	-	-		1	
Spirally Integrated Subjects	ECE	-	-	-	-	-	1	-	5	5	
	ALPHA and GEC	-	-	-	-	-	1	-	5	5	
Total		75	6x5=30	105	4x5=20	3x5=15	5x5=25	3x15=45	105	210	100
Total		105			105			105+105=210			

SECTION - VI

Time Table

RMU – 12 Integrated Modular MBBS Curriculum 2026

Isolation to **Beyond Boundaries**

CNS Module - I Time Table

Second Year MBBS

Session 2025 - 2026

Batch- 52

CNS Module-I Team

Module Name : CNS Module-I
 Duration of module : 06 Weeks
 Coordinator : Dr. Sara Bano
 Co-coordinator : Dr. Sadia Baqir
 Reviewed by : Module Committee

Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Sara Bano (Assistant Professor of Anatomy)
2.	Director DME & Dean Basic Sciences	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Farzana Fatima
3.	Additional Director (Assessment) DME	Dr. Arsalan Manzoor Mughal	3.	Co-coordinator	Dr. Minahil Haq (Senior Demonstrator of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Shazia Nosheen (Demonstrator of Physiology)
5.	Chairperson Anatomy	Prof. Dr. Ayesha Yousaf	5.	Co-coordinator	Dr. Rahat (Demonstrator of Biochemistry)
6.	Chairperson Biochemistry	Dr. Aneela Jamil			
7.	Focal Person Anatomy 2 nd Year MBBS	Dr. Maria Tasleem			
8.	Focal Person Physiology	Dr. Sidra Hamid	DME Implementation Team		
9.	Focal Person Pharmacology	Dr. Zunera Hakim	1.	Director DME	Prof. Dr. Ifra Saeed
10.	Focal Person Pathology	Dr. Syeda Ayesha	2.	Implementation Incharge 1st & 2 nd Year MBBS	Dr. Arsalan Manzoor Mughal
11.	Focal Person Behavioral Sciences	Dr. Zona Tahir			Dr. Farzana Fatima
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom	3.	Assistant Director DME	Dr. Farzana Fatima
13.	Focal Person Quran Translation Lectures	Dr. Fahd Anwar	4.	Editor	Muhammad Arslan Aslam
14.	Focal Person Family Medicine	Dr. Sadia Khan			

Discipline Wise Details of Modular Contents

Integration				
Theory				
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 & Sphingo 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	
• Islamiyat	• Verses about 'Amr bil Ma'ruf wa Nahi anil Munkar' and the importance of 'Amr bil Ma'ruf wa Nahi anil Munkar' • Qualities of Successful People • Rights of People (Life, Honor, Wealth, etc.)
• Pak Studies	• The foundation of the Muslim Ummah • The Economic System of Islam • In the service of Hazrat Shah Wali Ullah • Protection of Minorities
• Fahme Quran	• Emphatic Particle إن • Preposition “For” (اللام) Preposition (في)Preposition (إلى - من - على)
• Family Medicine	• Approach to a patient with headache
• Behavioral Sciences	• Sleep and Arousal • Defense Mechanism
Vertical Integration	
• Pharmacology	• Introduction to CNS
• Obs & Gynae	• Psychiatric Disorders in Pregnancy (Postpartum Blues Depression Psychosis) • Seizures during pregnancy(eclampsia/epilepsy)
• Pathology	• Pattern of Injury in Nerves System • Diseases of Myelin & Neurodegenerative Diseases
• Radiology	• Skull radiograph • CT Scan & MRI (Brain and Spinal Cord)
• Medicine	• Spinal cord and peripheral nervous system • Cerebellar disorders

	• Epilepsy and other convulsive disorders • Encephalitis • Stroke
• Surgery	• Spinal injury and Head injury • Brain Tumors & Brain Abscess • Poly trauma patient

Categorization of Modular Content Anatomy

Category A*	Category B**		Category C***			
Special Embryology	Special Histology	General Anatomy	Demonstrations / SGD	CBL	Practical's	Self-Directed Learning (SDL)
• Early CNS Development • Spinal Cord • Hindbrain & Cerebellum • Midbrain • Forebrain • Peripheral Nervous System • Development of Cranium	• 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	• Cystic Astrocytoma of cerebellum • Stroke	• Ganglia • Peripheral Nerves • Spinal Cord • Cerebellum • Cerebrum	• CSF rhinorrhea • Subdural and epidural hematoma • and intracranial hemorrhages • Meningitis & Spinal Cord injuries • Brown squared syndrome • Medullary syndromes • Pontine hemorrhage • Arnold Chiari syndrome • Weber's and benedicts aphasias & hydrocephalus • Cranial nerves 1-7 lesion • Cranial nerves 8-12 lesion parkinsonism, limbic system and reticular formation

Category A*: By Professors

Category B:** By Associate & Assistant Professors

Category C*:** By Senior Demonstrators & Demonstrators

Teaching Staff / Human Resource of Department of Anatomy

Sr. #	Designation of Teaching Staff / Human Resource	Total number of teaching staff
1.	Professor of Anatomy Department	03
2.	Assistant professor of Anatomy Department (AP)	03
3.	Demonstrators of Anatomy Department	05

Contact Hours (Faculty)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	$11 * 2 = 22$ hours
2.	Small Group Discussions (SGD)	$22 * 1.5 = 33$ hours
3.	Practical / Skill Lab	$6.5 * 5 = 32.5$ hours

Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	$1 * 11 = 11$ hours
2.	Small Group Discussions (SGD)	$1.5 * 22 = 33$ hours
3.	Practical / Skill Lab	$1.5 * 5 = 7.5$ hours
4.	Self-Directed Learning (SDL)	$2 * 10 = 20$ hours

Physiology

Category A & B*		Category C***			
LGIS	PBL	CBL	Practical's	SGD	SDL
• 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		1. CVA 2. Gullain Barr syndrome	1. Examination of sensory nervous system 2. Examination of Motor System 3. Examination of Cerebellar System 4. Ophthalmoscopy 5. Determination of field of vision	1. Synapse & sensory Receptors 2. Autonomic Nervous System 3. Motor nervous system , muscle spindle and Golgi tendon organ 4. Motor Nervous System 5. Basal Ganglia & limbic system 6. Analgesia system 7. Cerebellum	On Campus: 1. Sensory pathways for transmitting somatic signals 2. Somatosensory cortex & lesions of Somatosensory cortex 3. Introduction to autonomic nervous system Basic Characteristics of sympathetic & parasympathetic function 4. Excitatory & inhibitory effects of sympathetic & parasympathetic stimulation 5. CSF, Blood brain barrier, Blood CSF Barrier, Lumber puncture 6. Limbic system, 7. Functions of hypothalamus Online: 9. Learning and memory 10. Concept of Association areas, Concept of Dominant and nondominant cerebral hemispheres 11. Speech and aphasia 12. EEG and epilepsy 13. Reticular activating system and sleep 14. Muscle spindle & Golgi tendon organ, Role of muscle spindle and 15. Golgi tendon organ in voluntary motor activity 16. Motor cortex & physiological importance of neocortex, 17. Corticospinal or pyramidal tract, Extra pyramidal system

• 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 • Manifestations of cerebellar disease • Polysynaptic reflexes & Transection of spinal cord, • Role of brain stem in controlling motor functions & Lesions of motor system • Motor cortex & physiological importance of neocortex, Corticospinal or pyramidal tract, Extra pyramidal system • Basal Ganglia & Lesions					19. Basal Ganglia & Lesions
					Off Campus: 1. Organization of nervous system 2. Classification of sensory receptors 3. Sensory pathways for transmitting somatic signals 4. Physiology of pain, Dual 5. pathway for 6. transmission of pain, 7. CSF, Blood brain barrier, Blood CSF Barrier, 8. Lumbar puncture 9. Muscle spindle & 10. Golgi tendon organ, 11. Hypothalamus 12. Properties of reflex 13. action, Control of spinal cord 14. reflexes by higher centers 15. Reticular activating system 16. and sleep, EEG and epilepsy 17. Introduction to cerebellum, 18. Neuronal circuits of cerebellum 19. Basal Ganglia & Lesions
Category A*: By Professors					
Category B**: By Associate & Assistant Professors					
Category C***: By Senior Demonstrators & Demonstrators					

Teaching Staff / Human Resource of Department of Physiology

Sr. #	Designation Of Teaching Staff / HumanResource	Total number ofteaching staff
1.	Professor of physiology department	01
2.	Associate professor of physiology department	01
3.	Assistant professor of physiology department (AP)	01
4.	Demonstrators of physiology department	07
5.	Residents of physiology department (PGTs)	08

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LECTURES)	1 x 22= 22 x 1 hour = 22 hours
2.	Small Group Discussions (SGD)/CBL	25 x 1.5 hour = 37.5+2= 39.5 hours
3.	Problem Based Learning (PBL)	---
4.	Practical / Skill Lab	25 x 1.5 hour = 37.5 hours
5.	Self-Directed Learning (SDL)	oncampus 14 x 1 hour = 14 hours off campus 11x1 = 11 hours

Biochemistry

Category A & B	Category C***			
LGIS	PBL	CBL	Practical's	SGD
• Triglyceride Metabolism, Fatty acid transport • Oxidation of fatty acid • Oxidation of fatty acid • Fatty acid synthesis • Cholesterol Synthesis • Plasma Cholesterol level • Ketone body's metabolism • Biosynthesis of Glycerophospholipid • Biosynthesis of sphingophospho lipids • Introduction to Lipoproteins • LDL& HDL • Disorders of lipoprotein metabolism • Fatty liver & Adipose tissues • Disorders of lipoprotein metabolism		• Respiratory Distress Syndrome • IHD	• Color Test for Sterols • Detection of Cholesterol Crystals • Estimation of serum TAGS • Estimation of Serum HDL • Lipid Solubility & Acrolein test	• Triglycerides Metabolism • Fatty acid Oxidation • Ketone Bodies Metabolism •

Category A*: Associate Professor & Assistant Professor

Category B**: Senior Demonstrators & APWMO

Category C***: By All Demonstrators

Teaching Staff / Human Resource of Department of Biochemistry

Sr. #	Designation of Teaching Staff / Human Resource	Total number of teaching staff
1.	Associate Professor of Biochemistry Department (AP)	01
2.	Assistant Professor Biochemistry Department	02
3.	Demonstrators of Biochemistry Department	06

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours (Faculty)	Total Hours (student)
1.	Large Group Interactive Session (Lectures)	20 hours	10
2.	Small Group Discussions (SGD)	$7.5 * 7 = 37.5$ hours	7.5
3.	Problem Based Learning (PBL)	4 hours	4
4.	Practical / Skill Lab	$7.5 * 5 = 37.5$ hours	7.5
5.	Self-Directed Learning (SDL)	-----	05

Second Year Timetable for CNS Module-I (First Week)

(17-08-2026 To 22-08-2026)

Date/Day	Theme	8:00am-9:20am	9:20am – 10:10am	10:10am – 10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments			
17-08-2026 Monday	Sensory Loss, Numbness & Cranial Trauma-Related Symptoms	Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)		Break	ANATOMY (LGIS)		PHARMACOLOGY		Break	SGD / DISSECTION	SDL Physiology Organization of nervous system, Mechanism of synaptic transmission
			Organization of nervous system, Mechanism of synaptic transmission	Classification of sensory receptors & Properties of sensory receptors		General Anatomy Nervous system	Embryology Early development of CNS	Introduction to CNS Pharmacology			Anterior and Middle Cranial Fossa	
			Dr. Faizania (Even)	Prof. Dr. Samia / Dr. Aneela (Odd)		Assoc. Prof. Dr. Arsalan Manzoor (Even)	Prof. Dr. Ifra Saeed (Odd)	Dr. Muhammad Zaheer (Odd)	Dr. Aisha (Even)			
18-08-2026 Tuesday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)			ANATOMY (LGIS)		PBL 1 (SESSION-I)			SGD / DISSECTION	SDL Physiology Classification of sensory receptors
			Classification of sensory receptors & Properties of sensory receptors	Organization of nervous system, Mechanism of synaptic transmission		Embryology Early development of CNS	General anatomy Nervous system	PBL Team			Posterior cranial fossa	
			Prof. Dr. Samia / Dr. Aneela (Even)	Dr. Fazania(Odd)		Prof. Dr. Ifra Saeed (Even)	Assoc. Prof. Dr. Arsalan Manzoor (Odd)					
19-08-2026 Wednesday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)			ANATOMY (LGIS)		BIOCHEMISTRY (LGIS)			SGD / DISSECTION	SDL Biochemistry LDL Metabolism
			Properties of synaptic transmission	Physiology of Pain, dual Pathway for Transmission of pain, Analgesia system and thermal sensation		Embryology Development of Spinal Cord	General Anatomy Autonomic Nervous System	Triglyceride Metabolism Transport	Introduction to Lipoproteins, chylomicrons, VLDL Metabolism		Meninges, Dural venous sinuses and intracranial hemorrhages	
			Dr. Fazania (Even)	Prof. Dr. Samia / Dr. Aneela (Odd)		Prof. Dr. Ifra Saeed (Even)	Assoc. Prof. Dr. Arsalan Manzoor (Odd)	Dr. Aneela (Even)	Dr. Tayba (Odd)			
20-08-2026 Thursday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)			ANATOMY (LGIS)		PAK STUDIES			SGD / DISSECTION	SDL Biochemistry Chylomicrons & VLDL Metabolism
			Physiology of Pain, dual Pathway for Transmission of pain, Analgesia system and thermal sensation	Properties of synaptic transmission		General anatomy Autonomic Nervous system	Embryology Development of Spinal Cord	The foundation of the Muslim Ummah			Spinal Cord	
			Prof. Dr. Samia / Dr. Aneela (Even)	Dr. Faizania (Odd)		Assoc. Prof. Dr. Arsalan Manzoor (Even)	Prof. Dr. Ifra Saeed (Odd)	Ms Kinza Fiaz				
21-08-2026 Friday		8:00am-9:00am		9:00am-10:00am		10:00am-11:00am		11:00am-12:00pm			SDL Anatomy CSF rhinorrhea Subdural and epidural hematoma and intracranial hemorrhages	
		ISLAMIYAT		PHYSIOLOGY (LGIS)		SURGERY		BIOCHEMISTRY (LGIS)				
		Verses about 'Amr bil Ma'ruf wa Nahi anil Munkar' and the importance of 'Amr bil Ma'ruf wa Nahi anil Munkar'		Sensory Pathways for transmitting Somatic Signals		Introduction to AN, Basic Characteristics of Sympathetic & Parasympathetic	Poly trauma patient		Introduction to Lipoproteins, chylomicrons, VLDL Metabolism			Triglyceride Metabolism Transport
	Mufti Naeem Sherazi		Dr. Fahd (Even)	Dr Ali Zain (Odd)	Dr. Sara (Odd)	Dr. Maryam (Even)	Dr. Tayba (Even)	Dr. Aneela (Odd)				
Date/Day		8:00am-9:20am	9:20am – 10:10am	10:10am – 10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments			
22-08-2026 Saturday	Practical & CBL/SGD Topics & Venue Mentioned at the end		PHYSIOLOGY (LGIS)		Break	PATHOLOGY		CLINICO-CONCEPT CONNECT (C36) SESSION - I		Break	SGD / DISSECTION	SDL Anatomy Meningitis & Spinal Cord injuries
			Introduction to ANS, Basic Characteristics of Sympathetic & Parasympathetic	Sensory Pathways for transmitting Somatic Signals		Pattern of Injury in Nerves System		Sensory Loss, Numbness & Cranial Trauma-Related Symptoms				
								Anatomy				
			Dr Ali Zain (Even)	Dr. Fahd (Odd)		Physiology	Dr. Shazia					
						Pathology						
						Radiology	Dr. Zahid					
		Pharmacology										

Table No. 1 (Time: 08:00am – 09:20am)															
Batch Distribution for Practical Skills (all subjects) CBL / Small Group Discussion(Biochemistry and Physiology)			Topics for Skill Lab with Venue		Schedule for Practical										
					Day	Histology Practical		Biochemistry Practical		Physiology Practical			Physiology SGD		Biochemistry SGD
	Batch	Teacher Name	Batch	Teacher Name		Supervised by HOD	Batch	Teacher Name	Supervised by HOD	Batch	Teacher Name		Batch	Teacher Name	
Sr. No	Batch	Roll No.	Monday	C	Supervised by HOD		B	Dr. Rahat		E	Dr. Fareed	A	Dr. Aneela	D	Dr. Uzma
1.	A	01-70	Tuesday	D			C	Dr. Almas		A	Dr. Aneela	B	Dr. Shazia	E	Dr. Romessa
2.	B	71-140	Wednesday	E			D	Dr. Uzma		B	Dr. Shazia	C	Dr. Fahd	A	Dr. Sana Latif
3.	C	141-210	Thursday	B			A	Dr. Sana Latif		D	Dr. Jawad	E	Dr. Fareed	C	Dr. Almas
4.	D	211-280	Saturday	A			E	Dr. Romessa		C	Dr. Fahd Anwar	D	Dr. Jawad	B	Dr. Rahat
5.	E	281-onwards													
			• Peripheral Nerve (Anatomy Histology Practical) Venue- Histology laboratory (Dr. Sana Sameen)												
			• Color test for Sterols (Biochemistry practical)												
			• (Physiology Practical) Examination of sensory nervous system Venue – Physiology Lab												

		Topics for SGDs / CBL with Venue	
		- Physiology SGD: Synapse & Sensory Receptors (Venue: Lecture Hall No 5) - Biochemistry SGD: Triglyceride Metabolism (Venue: Lecture Hall No 2)	

Table No. 2 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions									
Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Romessa (Demonstrator Biochemistry)	6.	C2	(176-210)	New Lecture Hall Complex Lecture Theater # 01	Dr. Najam (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Farah (Demonstrator Physiology)	7.	D1	(210-245)	New Lecture Hall Complex Lecture Theater # 04	Dr. Mahnoor (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Almas Aijaz (APWMO Biochemistry)	8.	D2	(246-280)	New Lecture Hall Complex Lecture Theater # 04	Dr. Minahil Haq (Senior Demonstrator Anatomy)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Tariq Furqan (Senior Demonstrator Anatomy)	9.	E1	(281-315)	Anatomy Museum (First Floor Anatomy)	Dr. Rahat (APWMO Biochemistry)
5.	C1	(141-175)	New Lecture Hall Complex Lecture Theater # 01	Dr. Ali Zain (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04 (Basement)	Dr. Afsheen (PGT Physiology)

Table No. 3 Venues for Large Group Interactive Session (LGIS)	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 01
Even Roll Number	New Lecture Hall Complex Lecture Theater # 04

Table No. 4 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections					Table No. 5 Batch Distribution and Venues for Physiology Small Group Discussion SGDs				
Batches	Roll No	Subgroup	Anatomy Teacher	Venue	Batches	Roll No	Subgroup	Physiology Teacher	Venue
A	01- 70	A1: Roll No (1 – 17) A2: Roll No (18 – 34) A3: Roll No (35 – 51) A4: Roll No (52 – 70)	Dr. Minahil (Senior. Demonstrator)	Anatomy Museum	A	01-70	A1: Roll No (1 – 14) A2: Roll No (15 – 28) A3: Roll No (29 – 42) A4: Roll No (43 – 56) A5: Roll No (57 – 70)	Dr. Aneela Yasmeen (APWMO)	Physiology Lecture Hall 5
B	71-140	B1: Roll No (71 – 87) B2: Roll No (88 – 104) B3: Roll No (105 – 121) B4: Roll No (122 – 140)	Dr. Sadia Tehseen (PG Trainee Anatomy)	New Lecture Hall Complex 01	B	71-140	B1: Roll No (71 – 84) B2: Roll No (85 – 98) B3: Roll No (99 – 112) B4: Roll No (113 – 126) B5: Roll No (127 – 140)	Dr. Shazia Nosheen (APWMO)	Physiology Lecture Hall 5
C	141-210	C1: Roll No (141 – 157) C2: Roll No (158 – 174) C3: Roll No (175 – 191) C4: Roll No (192 – 210)	Dr. Sara Bano/Dr, Sadia Amaan (Assistant Professor)	Anatomy Lecture Hall 03	C	141-210	C1: Roll No (141 – 154) C2: Roll No (155 – 168) C3: Roll No (169 – 182) C4: Roll No (183 – 196) C5: Roll No (197 – 210)	Dr. Fahd Anwar (Demonstrator)	Physiology Lecture Hall 5
D	211- 280	D1: Roll No (211 – 227) D2: Roll No (228 - 244) D3: Roll No (245 – 261) D4: Roll No (262 – 280)	Dr. Sadia Baqir (APWMO)	Dissection Hall	D	211-280	D1: Roll No (211 – 224) D2: Roll No (225 – 238) D3: Roll No (239 – 252) D4: Roll No (253 – 266) D5: Roll No (267 – 280)	Dr. Jawad (Demonstrator)	Physiology Lecture Hall 5
E	281- onwards	E1: Roll No (281 – 297) E2: Roll No (298 – 314) E3: Roll No (315 – 331) E4: Roll No (332 – onwards)	Dr. Tariq Furqan (Senior Demonstrator)	New Lecture Hall Complex 4	E	281- onwards	E1: Roll No (281 – 294) E2: Roll No (295 – 308) E3: Roll No (309 – 322) E4: Roll No (323 – 336) E5: Roll No (337 – onwards)	Dr. Fareed Ullah (Demonstrator)	Physiology Lecture Hall 5
Supervised by Prof. Dr. Ayesha Yousaf					Supervised by Prof. Dr. Samia Sarwar				

Second Year Timetable for CNS Module-I (Second Week)
(24-08-2026 To 29-08-2026)

Date/Day	Theme	8:00am-9:20am	9:20am – 10:10am	10:10am – 10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments						
24-08-2026 Monday	Altered Consciousness, Raised ICP & CNS Infection Presentations	Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)		Break	BIOCHEMISTRY (LGIS)		PBL 1 (SESSION-II)		Break	SGD / DISSECTION		SDL Physiology Sensory pathways for transmitting somatic signals-II		
			Somatosensory cortex and lesions of somatosensory cortex	Excitatory and inhibitory effects of sympathetic and parasympathetic stimulation		LDL, HDL metabolism	Fatty Acid Oxidation I	PBL Team			Descending Tracts and their clinicals				
			Dr. Fahd (Even)	Dr Ali Zain (Odd)		Dr. Tayba (Even)	Dr. Aneela (Odd)				Assit. Prof. Dr. Sumyyia Bashir				
25-08-2026 Tuesday		Eid Milad un Nabi										SDL Physiology Physiology of pain Dual pathway for transmission of pain			
26-08-2026 Wednesday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)		Break	ANATOMY (LGIS)		PATHOLOGY		Break	SGD / DISSECTION		SDL Biochemistry HDL Metabolism		
			Excitatory and inhibitory effects of sympathetic and parasympathetic stimulation	Somatosensory cortex and lesions of somatosensory cortex		Brain Stem Nuclei	Brain Stem Nuclei	Diseases of Myelin & Neurodegenerative Diseases			Lesions of Spinal Cord				
		Dr Ali Zain (Even)	Dr. Fahd (Odd)	Asso. Prof. Dr. Maria Tasleem (Even)		Asso. Prof. Dr. Arsalan Manzoor (Odd)	Dr. Rabbia (Even)	Dr. Sarah (Odd)	Assit. Prof. Dr. Sumyyia Bashir						
27-08-2026 Thursday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)			BIOCHEMISTRY (LGIS)		JOINT SESSION			SGD / DISSECTION		SDL Biochemistry Hyper Lipidemias		
			Concept of Association areas, Concept of Dominant and non- dominant cerebral hemispheres	CSF, Blood Brain Barrier Blood CSF Barrier, Lumbar puncher		Fatty acid oxidation I	LDL, HDL metabolism	Meningitis			Medulla Oblongata				
								Anatomy	Dr. Sadia						
								Physiology	Dr. Shazia						
								Medicine	Dr. Javeria						
								Pathology	Dr. Rabbiya						
		Dr. Shazia (Even)	Dr. Ali Zain (Odd)	Dr. Aneela (Even)	Dr. Tayba (Odd)	Pediatrics	Dr. Afrah	Asso. Prof. Dr. Maria Tasleem							
Date/Day		8:00am-9:00am	9:00am-10:00am	10:00am-11:00am		11:00am-12:00pm		SDL Anatomy Brown Squared Syndrome							
		MEDICINE		PHYSIOLOGY (LGIS)		RADIOLOGY								BIOCHEMISTRY (LGIS)	
28-08-2026 Friday		Encephalitis		CSF, Blood Brain Barrier Blood CSF Barrier, Lumbar puncher	Concept of Association areas, Concept of Dominant and non-dominant cerebral hemispheres	Skull Radiograph								Hyperlipidemia and Fatty Liver	Fatty acid oxidation II
		Dr Imran Saeed (Even)	Dr Javeria Malik (Odd)	Dr. Ali Zain (Even)	Dr. Shazia (Odd)	Dr Fizza (Even)	Dr Saba Binte Kashmir (Odd)	Dr. Tayba (Even)	Dr. Aneela (Odd)						
Date/Day		8:00am-9:20am	9:20am – 10:10am	10:10am – 10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments						
29-08-2026 Saturday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)		Break	ANATOMY (LGIS)		CLINICO-CONCEPT CONNECT (C36) SESSION - II		Break	SGD / DISSECTION		SDL Anatomy Medullary syndromes Pontine hemorrhage Arnold Chiari syndrome		
			Speech and aphasia	Limbic system, Functions of hypothalamus		Embryology Development of Cranium	Histology Of spinal cord and peripheral nerve	Altered Consciousness, Raised ICP & CNS Infection Presentations			Pons & the Fourth Ventricle				
								Anatomy							
								Pathology							
								Radiology							
	Dr. Shazia (Even)		Dr. Ali Zain (Odd)	Assit. Prof. Dr. Sara Bano (Even)		Assit. Prof. Dr. Sadia Amaan (Odd)	Medicine	Asso. Prof. Dr. Maria Tasleem							

Table No. 1 (Time: 08:00am – 09:20am)																
Batch Distribution for Practical Skills (all subjects) CBL / Small Group Discussion (Biochemistry and Physiology)			Topics for Skill Lab with Venue • (Anatomy Histology Practical) Ganglia Venue-Histology laboratory (Dr. Sana Sameen) • (Biochemistry Practical) Detection of Cholesterol Crystals • (Physiology Practical) Examination of Motor System Venue – Physiology	Day	Histology Practical		Biochemistry Practical		Physiology Practical			Physiology SGD		Biochemistry SGD		
					Batch	Teacher Name	Batch	Teacher Name		Batch		Teacher Name		Batch	Teacher Name	Batch	Teacher Name
Sr. No	Batch	Roll No.		Monday	C	Supervised by HOD	B	Dr. Rahat	Supervised by HOD	E	Dr. Fareed	Supervised by HOD	A	Dr. Aneela	D	Dr. Uzma
1.	A	01-70		Tuesday	D		C	Dr. Almas		A	Dr. Aneela		B	Dr. Shazia	E	Dr. Romessa
2.	B	71-140		Wednesday	E		D	Dr. Uzma		B	Dr. Shazia		C	Dr. Fahd	A	Dr. Sana Latif
3.	C	141-210		Thursday	B		A	Dr. Sana Latif		D	Dr. Jawad		E	Dr. Fareed	C	Dr. Almas
4.	D	211-280		Saturday	A		E	Dr. Romessa		C	Dr. Fahd Anwar		D	Dr. Jawad	B	Dr. Rahat
5.	E	281-onwards														

			Topics for SGDs / CBL with Venue											
			- Physiology SGD: Autonomic Nervous System (Venue: Lecture Hall No 5) - Biochemistry SGD: Fatty Acid Oxidation (Venue: Lecture Hall No 2)											

Table No. 2 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions									
Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Romessa (Demonstrator Biochemistry)	6.	C2	(176-210)	New Lecture Hall Complex Lecture Theater # 01	Dr. Najam (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Farah (Demonstrator Physiology)	7.	D1	(210-245)	New Lecture Hall Complex Lecture Theater # 04	Dr. Mahnoor (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Almas Aijaz (APWMO Biochemistry)	8.	D2	(246-280)	New Lecture Hall Complex Lecture Theater # 04	Dr. Minahil Haq (Senior Demonstrator Anatomy)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Tariq Furqan (Senior Demonstrator Anatomy)	9.	E1	(281-315)	Anatomy Museum (First Floor Anatomy)	Dr. Rahat (APWMO Biochemistry)
5.	C1	(141-175)	New Lecture Hall Complex Lecture Theater # 01	Dr. Ali Zain (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04 (Basement)	Dr. Afsheen (PGT Physiology)

Table No. 3 Venues for Large Group Interactive Session (LGIS)	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 01
Even Roll Number	New Lecture Hall Complex Lecture Theater # 04

Table No. 4 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections					Table No. 5 Batch Distribution and Venues for Physiology Small Group Discussion SGDs				
Batches	Roll No	Subgroup	Anatomy Teacher	Venue	Batches	Roll No	Subgroup	Physiology Teacher	Venue
A	01- 70	A1: Roll No (1 – 17) A2: Roll No (18 – 34) A3: Roll No (35 – 51) A4: Roll No (52 – 70)	Dr. Minahil (Senior. Demonstrator)	Anatomy Museum	A	01-70	A1: Roll No (1 – 14) A2: Roll No (15 – 28) A3: Roll No (29 – 42) A4: Roll No (43 – 56) A5: Roll No (57 – 70)	Dr. Aneela Yasmeen (APWMO)	Physiology Lecture Hall 5
B	71-140	B1: Roll No (71 – 87) B2: Roll No (88 – 104) B3: Roll No (105 – 121) B4: Roll No (122 – 140)	Dr. Sadia Tehseen (PG Trainee Anatomy)	New Lecture Hall Complex 01	B	71-140	B1: Roll No (71 – 84) B2: Roll No (85 – 98) B3: Roll No (99 – 112) B4: Roll No (113 – 126) B5: Roll No (127 – 140)	Dr. Shazia Nosheen (APWMO)	Physiology Lecture Hall 5
C	141-210	C1: Roll No (141 – 157) C2: Roll No (158 – 174) C3: Roll No (175 – 191) C4: Roll No (192 – 210)	Dr. Sara Bano/Dr, Sadia Amaan (Assistant Professor)	Anatomy Lecture Hall 03	C	141-210	C1: Roll No (141 – 154) C2: Roll No (155 – 168) C3: Roll No (169 – 182) C4: Roll No (183 – 196) C5: Roll No (197 – 210)	Dr. Fahd Anwar (Demonstrator)	Physiology Lecture Hall 5
D	211- 280	D1: Roll No (211 – 227) D2: Roll No (228 - 244) D3: Roll No (245 – 261) D4: Roll No (262 – 280)	Dr. Sadia Baqir (APWMO)	Dissection Hall	D	211-280	D1: Roll No (211 – 224) D2: Roll No (225 – 238) D3: Roll No (239 – 252) D4: Roll No (253 – 266) D5: Roll No (267 – 280)	Dr. Jawad (Demonstrator)	Physiology Lecture Hall 5
E	281- onwards	E1: Roll No (281 – 297) E2: Roll No (298 – 314) E3: Roll No (315 – 331) E4: Roll No (332 – onwards)	Dr. Tariq Furqan (Senior Demonstrator)	New Lecture Hall Complex 4	E	281- onwards	E1: Roll No (281 – 294) E2: Roll No (295 – 308) E3: Roll No (309 – 322) E4: Roll No (323 – 336) E5: Roll No (337 – onwards)	Dr. Fareed Ullah (Demonstrator)	Physiology Lecture Hall 5
Supervised by Prof. Dr. Ayesha Yousaf					Supervised by Prof. Dr. Samia Sarwar				

Second Year Timetable for CNS Module-I (Third Week)
(31-08-2026 To 05-09-2026)

Date/Day	Theme	8:00am-9:20am	9:20am – 10:10am		10:10am – 10:30am	10:30am-11:20am		11:20am-12:10pm		12:10pm-12:30pm	12:30pm – 2:00pm		Home Assignments		
31-08-2026 Monday	Epileptic Seizures, Involuntary Movements & Motor Control Disorders	Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)		Break	ANATOMY (LGIS)		OBS & GYNAE		Break	SGD / DISSECTION		SDL		
			Limbic system, Functionsof hypothalamus	Speech and aphasia		Histology Of spinal cord and peripheral nerve	Embryology Development of Cranium	Seizures during pregnancy(eclampsia/epilepsy)			Midbrain	Physiology CSF, BBB, Blood CSF Barrier, LP			
			Dr. Ali Zain (Even)	Dr. Shazia (Odd)		Assit. Prof. Dr. Sadia Amaan (Even)	Assit. Prof. Dr. Sara Bano (Odd)	Dr Aqsa Ikram (Even)	Dr Tabinda (Odd)		Asso. Prof. Dr. Maria Tasleem				
01-09-2026 Tuesday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)			SURGERY		PAK STUDIES			CBL/SGD/ DISSECTION		SDL		
			Learning & Memory	Reticular Activating System & Sleep		Spinal injury and Head injury		The Economic System of Islam			CBL (Cystic Astrocytoma of Cerebellum) Cerebellum	Physiology Muscle spindle & Golgi tendon organ			
			Dr. Ali Zain (Even)	Dr. Fahd (Odd)		Dr. Atta ul Mumin (Odd)	Dr. Usman Malik (Even)	Ms Kinza Fiaz			Prof. Dr. Ayesha Yousaf				
02-09-2026 Wednesday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)			BIOCHEMISTRY (LGIS)		MEDICINE			SGD / DISSECTION		SDL		
			Reticular Activating System & Sleep	Learning & Memory		Hyperlipidemia & Fatty Liver	Fatty acid Oxidation-II	Epilepsy and other convulsive disorders			Thalamus, Epithalamus, Subthalamus	Biochemistry Fatty acid oxidation			
			Dr. Fahd (Even)	Dr. Ali Zain (Odd)		Dr. Tayba (Even)	Dr. Aneela (Odd)	Dr Imran Saeed (Even)	Dr Javeria Malik (Odd)		Prof. Dr. Ifra Saeed				
03-09-2026 Thursday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)			PAK STUDIES		MEDICINE			SGD / DISSECTION		SDL		
			EEG & Epilepsy	Introduction to Moto Nervous System & reflex action, Conditional Reflexes & Its Properties, Control of Spinal cord Reflexes by Higher Centers		In the service of Hazrat Shah Wali Ullah		Cerebellar disorders			Hypothalamus	Biochemistry			
			Dr. Ali Zain (Even)	Dr Sidra (Odd)		Ms Kinza Fiaz		Dr Imran Saeed (Even)	Dr Javeria Malik (Odd)		Assit. Prof. Dr. Sara Bano				
04-09-2026 Friday			8:00 AM – 9:00 AM	9:00 AM – 10:00 AM		10:00– 11:00AM		11:00– 12:00AM			SDL Anatomy Weber’s and Benedicts				
		Practical & CBL/SGD Topics & Venue Mentioned at the end 25-08-2026 (Tuesday Batch)	PHYSIOLOGY (LGIS)			ISLAMIYAT		BIOCHEMISTRY (LGIS)							
			EEG & Epilepsy	Introduction to Moto Nervous System & reflex action, Conditional Reflexes & Its Properties, Control of Spinal cord Reflexes by Higher Centers		Qualities of Successful People		Fatty acid synthesis	Cholesterol synthesis and regulation, hypercholesterolemia						
			Dr Sidra (Even)	Dr. Ali Zain (Odd)		Mufti Naeem Sherazi		Dr Aneela (Even)	Dr. Tayba (Odd)						
Date/Day		8:00am-9:20am	9:20am – 10:10am		10:10am – 10:30am	10:30am - 11:20pm		11:20am - 12:10pm		12:10pm-12:30pm	12:30pm – 2:00pm		Home Assignments		
05-09-2026 Saturday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)		Break	FEHM E QURAN – V		CLINICO-CONCEPT CONNECT (C36) SESSION - III		Break	SGD / DISSECTION		SDL Anatomy Aphasias & Hydrocephalus		
	Introduction to Cerebellum Neuronal Circuits of Cerebellum and its motor functions		Muscle Spindle & Golgi Tendon organ, role of muscle spindle & Golgi tendon organ in voluntary motor activity	Emphatic Particle ان Preposition “For” (اللام) Preposition (في)		Epileptic Seizures, Involuntary Movements & Motor Control Disorders		Cortical areas, Layers and Lesions of Cerebrum	Assit. Prof. Dr. Nafeesa Kiran		Mid Clinico-Concept Connect (C36) Session Evaluation				
				Anatomy											
				Biochemistry											
				Medicine											
		Dr Faizania (Even)	Dr.Sidra (Odd)		Qari Abdul Wahid		Pharmacology								

Table No. 1 (Time: 08:00am – 09:20am)																
Batch Distribution for Practical Skills (all subjects) CBL / Small Group Discussion(Biochemistry and Physiology)			Topics for Skill Lab with Venue		Schedule for Practical											
					Day	Histology Practical		Biochemistry Practical		Physiology Practical			Physiology SGD		Biochemistry SGD	
Batch	Teacher Name	Batch	Teacher Name	Supervised by HOD		Batch	Teacher Name	Supervised by HOD	Batch	Teacher Name	Batch		Teacher Name			
Sr. No	Batch	Roll No.	• (Anatomy Histology Practical) Spinal Cord Venue-Histology laboratory (Dr. Sana Sameen) • (Biochemistry Practical) Estimation of serum TAGS • (Physiology Practical) Examination of Cerebellar System Venue – Physiology Lab		Monday	C	Supervised by HOD		B	Dr. Rahat	E	Dr. Fareed	A	Dr. Aneela	D	Dr. Uzma
1.	A	01-70			Tuesday	D			C	Dr. Almas	A	Dr. Aneela	B	Dr. Shazia	E	Dr. Romessa
2.	B	71-140			Wednesday	E			D	Dr. Uzma	B	Dr. Shazia	C	Dr. Fahd	A	Dr. Sana Latif
3.	C	141-210			Thursday	B			A	Dr. Sana Latif	D	Dr. Jawad	E	Dr. Fareed	C	Dr. Almas
4.	D	211-280			Saturday	A			E	Dr. Romessa	C	Dr. Fahd Anwar	D	Dr. Jawad	B	Dr. Rahat
5.	E	281-onwards														

		Topics for SGDs / CBL with Venue	
		- Anatomy CBL: Cystic Astrocytoma of Cerebellum - Physiology SGDs: Motor nervous system, muscle spindle and Golgi tendon organ (Venue: Lecture Hall No 5) - Biochemistry CBL: Respiratory Distress syndrome (Venue: Lecture Hall No 2)	

Table No. 2 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions									
Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Romessa (Demonstrator Biochemistry)	6.	C2	(176-210)	New Lecture Hall Complex Lecture Theater # 01	Dr. Najam (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Farah (Demonstrator Physiology)	7.	D1	(210-245)	New Lecture Hall Complex Lecture Theater # 04	Dr. Mahnoor (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Almas Aijaz (APWMO Biochemistry)	8.	D2	(246-280)	New Lecture Hall Complex Lecture Theater # 04	Dr. Minahil Haq (Senior Demonstrator Anatomy)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Tariq Furqan (Senior Demonstrator Anatomy)	9.	E1	(281-315)	Anatomy Museum (First Floor Anatomy)	Dr. Rahat (APWMO Biochemistry)
5.	C1	(141-175)	New Lecture Hall Complex Lecture Theater # 01	Dr. Ali Zain (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04 (Basement)	Dr. Afsheen (PGT Physiology)

Table No. 3 Venues for Large Group Interactive Session (LGIS)	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 01
Even Roll Number	New Lecture Hall Complex Lecture Theater # 04

Table No. 4 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections					Table No. 5 Batch Distribution and Venues for Physiology Small Group Discussion SGDs				
Batches	Roll No	Subgroup	Anatomy Teacher	Venue	Batches	Roll No	Subgroup	Physiology Teacher	Venue
A	01- 70	A1: Roll No (1 – 17) A2: Roll No (18 – 34) A3: Roll No (35 – 51) A4: Roll No (52 – 70)	Dr. Minahil (Senior. Demonstrator)	Anatomy Museum	A	01-70	A1: Roll No (1 – 14) A2: Roll No (15 – 28) A3: Roll No (29 – 42) A4: Roll No (43 – 56) A5: Roll No (57 – 70)	Dr. Aneela Yasmeen (APWMO)	Physiology Lecture Hall 5
B	71-140	B1: Roll No (71 – 87) B2: Roll No (88 – 104) B3: Roll No (105 – 121) B4: Roll No (122 – 140)	Dr. Sadia Tehseen (PG Trainee Anatomy)	New Lecture Hall Complex 01	B	71-140	B1: Roll No (71 – 84) B2: Roll No (85 – 98) B3: Roll No (99 – 112) B4: Roll No (113 – 126) B5: Roll No (127 – 140)	Dr. Shazia Nosheen (APWMO)	Physiology Lecture Hall 5
C	141-210	C1: Roll No (141 – 157) C2: Roll No (158 – 174) C3: Roll No (175 – 191) C4: Roll No (192 – 210)	Dr. Sara Bano/Dr, Sadia Amaan (Assistant Professor)	Anatomy Lecture Hall 03	C	141-210	C1: Roll No (141 – 154) C2: Roll No (155 – 168) C3: Roll No (169 – 182) C4: Roll No (183 – 196) C5: Roll No (197 – 210)	Dr. Fahd Anwar (Demonstrator)	Physiology Lecture Hall 5
D	211- 280	D1: Roll No (211 – 227) D2: Roll No (228 - 244) D3: Roll No (245 – 261) D4: Roll No (262 – 280)	Dr. Sadia Baqir (APWMO)	Dissection Hall	D	211-280	D1: Roll No (211 – 224) D2: Roll No (225 – 238) D3: Roll No (239 – 252) D4: Roll No (253 – 266) D5: Roll No (267 – 280)	Dr. Jawad (Demonstrator)	Physiology Lecture Hall 5
E	281- onwards	E1: Roll No (281 – 297) E2: Roll No (298 – 314) E3: Roll No (315 – 331) E4: Roll No (332 – onwards)	Dr. Tariq Furqan (Senior Demonstrator)	New Lecture Hall Complex 4	E	281- onwards	E1: Roll No (281 – 294) E2: Roll No (295 – 308) E3: Roll No (309 – 322) E4: Roll No (323 – 336) E5: Roll No (337 – onwards)	Dr. Fareed Ullah (Demonstrator)	Physiology Lecture Hall 5
Supervised by Prof. Dr. Ayesha Yousaf					Supervised by Prof. Dr. Samia Sarwar				

Second Year Timetable for CNS Module-I (Fourth Week)

(07-09-2026 To 12-09-2026)

Date/Day	Theme	8:00am-9:20am	9:20am – 10:10am	10:10am – 10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments				
07-09-2026 Monday	Ataxia, Speech Disturbance & Cranial Nerve Dysfunction	Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY (LGIS)		Break	BIOCHEMISTRY (LGIS)		PBL 2 (SESSION-I)		SGD / DISSECTION	SDL Physiology Hypothalamus		
			Introduction to Cerebellum, Neuronal Circuits of Cerebellum & Its Motor functions	Muscle Spindle & Golgi Tendon organ, role of muscle spindle & Golgi tendon organ in voluntary motor activity		Cholesterol synthesis and regulation, hypercholesterolemia	Fatty acid synthesis	PBL Team					
			Dr. Faizania (Odd)	Dr. Sidra (Even)		Dr. Tayba (Even)	Dr. Aneela (Odd)						
08-09-2026 Tuesday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY LGIS			ANATOMY (LGIS)		MEDICINE		SGD / DISSECTION	SDL Physiology Properties of reflex action, Control of spinal cord reflexes by higher centers		
			Manifestation of cerebellar disease	Polysynaptic & transactions of spinal cord, role of brain stem in controlling motor function and lesions of motor systems		Histology of Cerebellum	Embryology Development of Rhombencephalon, Mesencephalon & Prosencephalon	Spinal cord and peripheral nervous system					
			Dr. Faizania (Odd)	Dr. Sidra (Even)		Asst. Prof. Dr Sara Bano (Even)	Asso. Prof. Dr. Maria Tasleem (Odd)	Dr Imran Saeed (Even)	Dr Javeria (Odd)				
09-09-2026 Wednesday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY LGIS			BEHAVIORAL SCIENCES		PBL 2 (SESSION-II)		SGD / DISSECTION	SDL Biochemistry Ketone Bodies Metabolism		
			Polysynaptic & transactions of spinal cord, role of brain stem in controlling motor function and lesions of motor systems	Manifestation of cerebellar disease		Sleep and Arousal		PBL Team					
			Dr. Sidra (Odd)	Dr. Fazania (Even)		Dr. Mehmood Ali Khan (Odd)	Dr. Mehboob Ali Shah (Even)						
10-09-2026 Thursday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY LGIS			CLINICO-CONCEPT CONNECT (C36) SESSION - IV						SGD / DISSECTION	SDL Biochemistry
			Motor Cortex and physiological importance of neo cortex, corticospinal / pyramidal and extra pyramidal system	Basal Ganglia and its lesions		Ataxia, Speech Disturbance & Cranial Nerve Dysfunction							
			Dr Fahd (Even)	Dr Ali Zain (Odd)		Anatomy							
						Physiology	Dr. Shazia						
						Medicine							
						Radiology							
		Pathology	Dr. Rabbia										
11-09-2026 Friday		8:00 AM – 9:00 AM ISLAMIYAT Rights of People (Life, Honor, Wealth, etc.) Mufti Naeem Sherazi	9:00 AM – 10:00 AM BIOCHEMISTRY (LGIS)			10:00– 11:00AM SGD / DISSECTION				11:00AM – 12:00PM		SDL Anatomy CSF and Blood Brain Barrier Cranial nerves 1-7 lesions Cranial nerves 8-12 lesions	
			Metabolism of Glycerophospholipids and siphonophore lipid	Ketone body metabolism		Cranial Nerves VIII-XII							
			Dr. Tayba (Even)	Dr. Aneela (Odd)		Asst. Prof. Dr Sara Bano							
12-09-2026 Saturday	Practical & CBL/SGD Topics & Venue Mentioned at the end.		Early Clinical Exposure (ECE)								SDL Anatomy parkinsonism, limbic system and reticular formation		

Table No. 1 (Time: 08:00am – 09:20am)																
Batch Distribution for PracticalSkills (all subjects) CBL / Small Group Discussion(Biochemistry and Physiology)			Topics for Skill Lab with Venue		Schedule for Practical											
					Day	Histology Practical		Biochemistry Practical		Physiology Practical			Physiology SGD		Biochemistry SGD	
Batch	Teacher Name	Batch	Teacher Name	Supervised by HOD		Batch	Teacher Name	Supervised by HOD	Batch	Teacher Name	Batch		Teacher Name			
Sr. No	Batch	Roll No.	• (Anatomy Histology Practical) Cerebellum Venue-Histology laboratory (Dr. Sana Sameen) • (Biochemistry Practical) Estimation of Serum HDL • (Physiology Practical) Ophthalmoscopy Venue – Physiology Lab		Monday	C	Supervised by HOD		B	Dr. Rahat	E	Dr. Fareed	A	Dr. Aneela	D	Dr. Uzma
1.	A	01-70			Tuesday	D			C	Dr. Almas	A	Dr. Aneela	B	Dr. Shazia	E	Dr. Romessa
2.	B	71-140			Wednesday	E			D	Dr. Uzma	B	Dr. Shazia	C	Dr. Fahd	A	Dr. Sana Latif
3.	C	141-210			Thursday	B			A	Dr. Sana Latif	D	Dr. Jawad	E	Dr. Fareed	C	Dr. Almas
4.	D	211-280			Saturday	A			E	Dr. Romessa	C	Dr. Fahd Anwar	D	Dr. Jawad	B	Dr. Rahat
5.	E	281-onwards														
			Topics for SGDs / CBL with Venue													
			• Physiology SGD: Motor Nervous System (Venue: Lecture Hall No 5) • Biochemistry CBL: Ischemic Heart disease (Venue :Lecture Hall No 2)													

Table No. 2 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions									
Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Romessa (Demonstrator Biochemistry)	6.	C2	(176-210)	New Lecture Hall Complex Lecture Theater # 01	Dr. Najam (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Farah (Demonstrator Physiology)	7.	D1	(210-245)	New Lecture Hall Complex Lecture Theater # 04	Dr. Mahnoor (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Almas Aijaz (APWMO Biochemistry)	8.	D2	(246-280)	New Lecture Hall Complex Lecture Theater # 04	Dr. Minahil Haq (Senior Demonstrator Anatomy)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Tariq Furqan (Senior Demonstrator Anatomy)	9.	E1	(281-315)	Anatomy Museum (First Floor Anatomy)	Dr. Rahat (APWMO Biochemistry)
5.	C1	(141-175)	New Lecture Hall Complex Lecture Theater # 01	Dr. Ali Zain (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04 (Basement)	Dr. Afsheen (PGT Physiology)

Table No. 3 Venues for Large Group Interactive Session (LGIS)	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 01
Even Roll Number	New Lecture Hall Complex Lecture Theater # 04

Table No. 4 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections					Table No. 5 Batch Distribution and Venues for Physiology Small Group Discussion SGDs				
Batches	Roll No	Subgroup	Anatomy Teacher	Venue	Batches	Roll No	Subgroup	Physiology Teacher	Venue
A	01- 70	A1: Roll No (1 – 17) A2: Roll No (18 – 34) A3: Roll No (35 – 51) A4: Roll No (52 – 70)	Dr. Minahil (Senior. Demonstrator)	Anatomy Museum	A	01-70	A1: Roll No (1 – 14) A2: Roll No (15 – 28) A3: Roll No (29 – 42) A4: Roll No (43 – 56) A5: Roll No (57 – 70)	Dr. Aneela Yasmeen (APWMO)	Physiology Lecture Hall 5
B	71-140	B1: Roll No (71 – 87) B2: Roll No (88 – 104) B3: Roll No (105 – 121) B4: Roll No (122 – 140)	Dr. Sadia Tehseen (PG Trainee Anatomy)	New Lecture Hall Complex 01	B	71-140	B1: Roll No (71 – 84) B2: Roll No (85 – 98) B3: Roll No (99 – 112) B4: Roll No (113 – 126) B5: Roll No (127 – 140)	Dr. Shazia Nosheen (APWMO)	Physiology Lecture Hall 5
C	141-210	C1: Roll No (141 – 157) C2: Roll No (158 – 174) C3: Roll No (175 – 191) C4: Roll No (192 – 210)	Dr. Sara Bano/Dr, Sadia Amaan (Assistant Professor)	Anatomy Lecture Hall 03	C	141-210	C1: Roll No (141 – 154) C2: Roll No (155 – 168) C3: Roll No (169 – 182) C4: Roll No (183 – 196) C5: Roll No (197 – 210)	Dr. Fahd Anwar (Demonstrator)	Physiology Lecture Hall 5
D	211- 280	D1: Roll No (211 – 227) D2: Roll No (228 - 244) D3: Roll No (245 – 261) D4: Roll No (262 – 280)	Dr. Sadia Baqir (APWMO)	Dissection Hall	D	211-280	D1: Roll No (211 – 224) D2: Roll No (225 – 238) D3: Roll No (239 – 252) D4: Roll No (253 – 266) D5: Roll No (267 – 280)	Dr. Jawad (Demonstrator)	Physiology Lecture Hall 5
E	281- onwards	E1: Roll No (281 – 297) E2: Roll No (298 – 314) E3: Roll No (315 – 331) E4: Roll No (332 – onwards)	Dr. Tariq Furqan (Senior Demonstrator)	New Lecture Hall Complex 4	E	281- onwards	E1: Roll No (281 – 294) E2: Roll No (295 – 308) E3: Roll No (309 – 322) E4: Roll No (323 – 336) E5: Roll No (337 – onwards)	Dr. Fareed Ullah (Demonstrator)	Physiology Lecture Hall 5
Supervised by Prof. Dr. Ayesha Yousaf					Supervised by Prof. Dr. Samia Sarwar				

Second Year Timetable for CNS Module-I (Fifth Week)
(14-09-2026 To 19-09-2026)

Date/Day	Theme	8:00am-9:20am	9:20am – 10:10am	10:10am – 10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments					
14-09-2026 Monday	Hemiplegia, Strokes, Neuro-Degeneration & Behavioral Disturbance	Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY LGIS		Break	MEDICINE		FAMILY MEDICINE		Break	SGD / DISSECTION		SDL Physiology Introduction to cerebellum Neuronal circuits of cerebellum	
			Basal Ganglia and its lesions	Motor Cortex and physiological importance of neo cortex, corticospinal / pyramidal and extra pyramidal system		Stroke		Approach to a patient with neuronal disease			Basal Ganglia			
			Dr Ali Zain (Even)	Dr Fahd (Odd)										
15-09-2026 Tuesday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY SDL NO. 1			ANATOMY (LGIS)		RADIOLOGY			SGD / DISSECTION		SDL Physiology Basal Ganglia & Lesions	
			Basal Ganglia			Embryology Development of Rhombencephalon, Mesencephalon & Prosencephalon	Histology of Cerebellum	CT scan and MRI (Brain and Spinal Cord)			Limbic system and Reticular Formation			
			Dr. Afsheen (Even)	Dr. Farhat (Odd)		Asso. Prof. Dr. Maria Tasleem (Even)	Asst. Prof. Dr Sara Bano (Odd)	Dr Riffat Raja (Even)	Dr Sajida (Odd)		Asso. Prof. Dr. Arsalan Manzoor			
16-09-2026 Wednesday		Practical & CBL/SGD Topics & Venue Mentioned at the end	BIOCHEMISTRY LGIS			FEHM E QURAN – VI		SURGERY			CBL/SGD/ DISSECTION		SDL Biochemistry Synthesis of Cholesterol and its regulation	
			Metabolism of Glycerophospholipids and sphingophospho lipid	Ketone Body Metabolism		Preposition (إلى من -على)		Brain Tumors & Brain Abscess			CBL (Middle Cerebral Artery Stroke) Blood supply of Brain and Clinicals			
			Dr. Tayba (Odd)	Dr. Aneela (Even)		Qari Abdul Wahid		Dr. Usman Malik (Odd)	Dr. Atta ul Munim (Even)					
17-09-2026 Thursday		Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY SDL NO. 2			PAK STUDIES		BEHAVIORAL SCIENCES			SGD / DISSECTION		SDL Biochemistry Fatty Liver	
			Polysynaptic Reflexes			Protection of Minorities		Defense Mechanism			Radiological Imaging of CNS			
			Dr Farhat (Even)	Dr. Mahnoor (Odd)		Ms Kinza Fiaz		Dr. Zona Tahir (Odd)	Dr. Sara Afzal (Even)					
18-09-2026 Friday		8:00 AM – 9:00 AM	9:00 AM – 10:00 AM			10:00 – 11:00AM		11:00AM – 12:00PM			SDL Anatomy Cranial nerves 8-12, Basal Ganglia, Limbic system and Reticular Formation			
		ISLAMIYAT	BIOCHEMISTRY SDL			ANATOMY (LGIS)		OBS & GYNAE						
		Women’s Rights	Glycerophospholipids & Sphingolipids			Histology of Cerebrum	Histology of Cerebrum	Psychiatric Disorders in Pregnancy (Postpartum Blues Depression Psychosis)						
	Mufti Naeem Sherazi	Dr. Uzma Zafar (Odd)	Dr. Nayab (Even)	Asso. Prof. Dr. Maria (Odd)	Assit. Prof. Dr. Sara Bano (Even)	Dr. Hina Gul (Odd)	Dr. Naheed (Even)							
Date/Day		8:00am-9:20am	9:20am – 10:10am	10:10am – 10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignments					
19-09-2026 Saturday	Practical & CBL/SGD Topics & Venue Mentioned at the end	PHYSIOLOGY SDL NO. 3		Break	CLINICO-CONCEPT CONNECT (C36) SESSION – V		Break	SGD/ DISSECTION		SDL Anatomy End Clinico-Concept Connect (C36) Session Evaluation				
		Sensory Pathway			Hemiplegia, Strokes, Neuro-Degeneration & Behavioral Disturbance			Cross Sectional Study / Dissection						
		Dr. Jawad (Odd)	Dr. Fareed (Even)		Anatomy									
					Medicine									
					Radiology									
					Pathology	Dr. Rabbia								
					Family Medicine									

Table No. 1 (Time: 08:00am – 09:20am)																
Batch Distribution for Practical Skills (all subjects) CBL / Small Group Discussion(Biochemistry and Physiology)			Topics for Skill Lab with Venue		Schedule for Practical											
					Day	Histology Practical		Biochemistry Practical		Physiology Practical		Physiology SGD		Biochemistry SGD		
Batch	Teacher Name	Batch	Teacher Name	Supervised by HOD		Batch	Teacher Name	Supervised by HOD	Batch			Teacher Name	Batch	Teacher Name		
Sr. No	Batch	Roll No.	(Anatomy Histology Practical) Cerebrum. Venue-Histology laboratory (Dr. Sana Sameen) (Biochemistry Practical) Lipid Solubility & Acrolein test (Physiology Practical) Determination of field of vision Venue – Physiology Lab		Monday	C	Supervised by HOD		B	Dr. Rahat	Supervised by HOD	E	Dr. Fareed	Supervised by HOD	A	Dr. Aneela	D	Dr. Uzma
1.	A	01-70		Tuesday	D	C		Dr. Almas	A	Dr. Aneela		B	Dr. Shazia		E	Dr. Romessa
2.	B	71-140		Wednesday	E	D		Dr. Uzma	B	Dr. Shazia		C	Dr. Fahd		A	Dr. Sana Latif
3.	C	141-210		Thursday	B	A		Dr. Sana Latif	D	Dr. Jawad		E	Dr. Fareed		C	Dr. Almas
4.	D	211-280		Saturday	A	E		Dr. Romessa	C	Dr. Fahd Anwar		D	Dr. Jawad		B	Dr. Rahat
5.	E	281-onwards														

Topics for SGDs / CBL with Venue														
- Anatomy CBL: Middle Cerebral Artery Stroke - Physiology SGD: Basal Ganglia & limbic system (Venue: Lecture Hall No 5) - Biochemistry SGD: Ketone body metabolism (Venue: Lecture Hall No 2)														

Table No. 2 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions									
Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Romessa (Demonstrator Biochemistry)	6.	C2	(176-210)	New Lecture Hall Complex Lecture Theater # 01	Dr. Najam (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Farah (Demonstrator Physiology)	7.	D1	(210-245)	New Lecture Hall Complex Lecture Theater # 04	Dr. Mahnoor (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Almas Aijaz (APWMO Biochemistry)	8.	D2	(246-280)	New Lecture Hall Complex Lecture Theater # 04	Dr. Minahil Haq (Senior Demonstrator Anatomy)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Tariq Furqan (Senior Demonstrator Anatomy)	9.	E1	(281-315)	Anatomy Museum (First Floor Anatomy)	Dr. Rahat (APWMO Biochemistry)
5.	C1	(141-175)	New Lecture Hall Complex Lecture Theater # 01	Dr. Ali Zain (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04 (Basement)	Dr. Afsheen (PGT Physiology)

Table No. 3 Venues for Large Group Interactive Session (LGIS)	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 01
Even Roll Number	New Lecture Hall Complex Lecture Theater # 04

Table No. 4 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections					Table No. 5 Batch Distribution and Venues for Physiology Small Group Discussion SGDs				
Batches	Roll No	Subgroup	Anatomy Teacher	Venue	Batches	Roll No	Subgroup	Physiology Teacher	Venue
A	01- 70	A1: Roll No (1 – 17) A2: Roll No (18 – 34) A3: Roll No (35 – 51) A4: Roll No (52 – 70)	Dr. Minahil (Senior. Demonstrator)	Anatomy Museum	A	01-70	A1: Roll No (1 – 14) A2: Roll No (15 – 28) A3: Roll No (29 – 42) A4: Roll No (43 – 56) A5: Roll No (57 – 70)	Dr. Aneela Yasmeen (APWMO)	Physiology Lecture Hall 5
B	71-140	B1: Roll No (71 – 87) B2: Roll No (88 – 104) B3: Roll No (105 – 121) B4: Roll No (122 – 140)	Dr. Sadia Tehseen (PG Trainee Anatomy)	New Lecture Hall Complex 01	B	71-140	B1: Roll No (71 – 84) B2: Roll No (85 – 98) B3: Roll No (99 – 112) B4: Roll No (113 – 126) B5: Roll No (127 – 140)	Dr. Shazia Nosheen (APWMO)	Physiology Lecture Hall 5
C	141-210	C1: Roll No (141 – 157) C2: Roll No (158 – 174) C3: Roll No (175 – 191) C4: Roll No (192 – 210)	Dr. Sara Bano/Dr, Sadia Amaan (Assistant Professor)	Anatomy Lecture Hall 03	C	141-210	C1: Roll No (141 – 154) C2: Roll No (155 – 168) C3: Roll No (169 – 182) C4: Roll No (183 – 196) C5: Roll No (197 – 210)	Dr. Fahd Anwar (Demonstrator)	Physiology Lecture Hall 5
D	211- 280	D1: Roll No (211 – 227) D2: Roll No (228 - 244) D3: Roll No (245 – 261) D4: Roll No (262 – 280)	Dr. Sadia Baqir (APWMO)	Dissection Hall	D	211-280	D1: Roll No (211 – 224) D2: Roll No (225 – 238) D3: Roll No (239 – 252) D4: Roll No (253 – 266) D5: Roll No (267 – 280)	Dr. Jawad (Demonstrator)	Physiology Lecture Hall 5
E	281- onwards	E1: Roll No (281 – 297) E2: Roll No (298 – 314) E3: Roll No (315 – 331) E4: Roll No (332 – onwards)	Dr. Tariq Furqan (Senior Demonstrator)	New Lecture Hall Complex 4	E	281- onwards	E1: Roll No (281 – 294) E2: Roll No (295 – 308) E3: Roll No (309 – 322) E4: Roll No (323 – 336) E5: Roll No (337 – onwards)	Dr. Fareed Ullah (Demonstrator)	Physiology Lecture Hall 5
Supervised by Prof. Dr. Ayesha Yousaf					Supervised by Prof. Dr. Samia Sarwar				

Schedule for LMS Based Weekly Online Assessments for Second Year MBBS (CNS Module-I) Batch 52

The online assessment for CNS Module-I for Second Year MBBS will be as per following schedule:

Class	Module	Day & Date	Time of Assessment	Focal person	Department Responsible
Second Year MBBS	CNS Module-I	Monday 24-08-2026	9:00 pm-9:30pm	Prof. Dr Ayesha Yousaf	Anatomy
		Wednesday 26-08-2026	9:00 pm-9:30pm	Dr Aneela Jamil	Biochemistry
		Thursday 27-08-2026	9:00 pm-9:30pm	Prof. Dr Samia Sarwar	Physiology
		Monday 31-08-2026	9:00 pm-9:30pm	Prof. Dr Ayesha Yousaf	Anatomy
		Tuesday 01-09-2026	9:00 pm-9:30pm	Prof. Dr Samia Sarwar	Physiology
		Wednesday 02-09-2026	9:00 pm-9:30pm	Dr Aneela Jamil	Biochemistry
		Monday 07-09-2026	9:00 pm-9:30pm	Prof. Dr Ayesha Yousaf	Anatomy
		Tuesday 08-09-2026	9:00 pm-9:30pm	Prof. Dr Samia Sarwar	Physiology
		Wednesday 09-09-2026	9:00 pm-9:30pm	Dr Aneela Jamil	Biochemistry

Second Year Timetable for CNS Module-I (Sixth Week)
(21-09-2026 to 30-09-2026)

Date & Day	Tentative Schedule
21-09-2026 Monday	Module Assessment
22-09-2026 Tuesday	
23-09-2026 Wednesday	
24-09-2026 Thursday	Block Assessment
25-09-2026 Friday	
26-09-2026 Saturday	
28-09-2026 Monday	
29-09-2026 Tuesday	
30-09-2026 Wednesday	

Note: Detailed notice regarding content, time and venue will be issued accordingly

Note: Timetable Subject to change according to the current circumstances.

Annexure I

Templates for Theory Paper

- **MCQ, SEQ Paper, & EMQ**

Templates for AV OSPE

Templates for Structured Viva

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

RMU-12
Integrated Modular Curriculum 2026
Isolation to Beyond Boundaries

Approved Template of Module Assessment

Multiple choice questions (MCQs)		% Weightage	Number of MCQs	Level of Cognition
Section A	Complimentary Integration (Theme Based) of Anatomy / Physiology / Biochemistry	(70%)	18MCQs	C1-C4
Section B	Integrations	(30%)		
	• Multidisciplinary Integration	(10%)	2 MCQs	C4
	• Interdisciplinary Integration	(5%)	1 MCQs	C4, C5
	• Transdisciplinary Integration	(5%)	2 MCQs	C5, C6
	• C ³ 6 Sessions Transdisciplinary Integration	(10%)	2 MCQs	C6

Chairperson

Department of _____
Rawalpindi Medical University, Rawalpindi

Additional Director Assessment

Rawalpindi Medical University
Rawalpindi

Director DME

Rawalpindi Medical University
Rawalpindi

Prof. Dr. Muhammad Umar

Vice Chancellor
Rawalpindi Medical University
Rawalpindi

Rawalpindi Medical University Rawalpindi
Department of Anatomy, Physiology & Biochemistry
MCQs & EMQ Paper for _____ Module, Second Year MBBS Batch 52
Date: 00-00-0000

Total Marks: 30 (MCQs: 25, EMQ: 5)

Total Time: 30 Minutes

Each MCQ carries 1 mark and EMQ carries 5 marks

Roll No. _____

Name. _____

Encircle the single best response

Q.#	RMU-12 Integrated Modular Curriculum 2026 Isolation to Beyond Boundaries Integrated Modular Assessment of the Subject Anatomy, Physiology & Biochemistry Section A: Complimentary Integration of Anatomy / Physiology / Biochemistry (70%)	Level of Cognition
1.	Question a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C1
Section – B: Integrations (30%)		
Multidisciplinary Integration (5%)		
2.	Horizontal Integration with Anatomy (2.5%) Questions a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C4
Interdisciplinary/Transdisciplinary Integration (15%)		

3.	Question a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C5
C³6 Sessions Integration (10%)		
4.	Question a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C6
5.	Question a. b. c. d. e. USMLE: Type Question Reference: Ganong 25 th Edition Page No. 101	C6

RMU-12
Integrated Modular Curriculum 2026
Isolation to Beyond Boundaries
Approved Template of Module Assessment

Short Answer Questions (SAQs) Total Marks: 25 (Each SAQ carries 5 marks)	% Weightage	Number of SAQs	Level of Cognition
Complimentary Integration (Theme Based) of Anatomy / Physiology / Biochemistry	(60%)	3SAQ	C1-C4
Integrations	(40%)		
Multidisciplinary Integration	(20%)	1SAQ	C4
Interdisciplinary Integration / Transdisciplinary Integration / C ³ 6 Sessions Transdisciplinary Integration	(20%)	1SAQ	C4, C5

Short Essay Question (SEQs) Total Marks: 45 (Each SEQ carries 9 marks)	% Weightage	Number of SEQs	Level of Cognition
Complimentary Integration (Theme Based) of Anatomy / Physiology / Biochemistry	(60%)	3SEQ	C1-C4
Integrations	(40%)		
Multidisciplinary Integration	(20%)	1SEQ	C4
Interdisciplinary Integration / Transdisciplinary Integration / C ³ 6 Sessions Transdisciplinary Integration	(20%)	1SEQ	C4, C5

Chairperson
 Department of _____
 Rawalpindi Medical University, Rawalpindi

Additional Director Assessment
 Rawalpindi Medical University
 Rawalpindi

Director DME
 Rawalpindi Medical University
 Rawalpindi

Prof. Dr. Muhammad Umar
 Vice Chancellor
 Rawalpindi Medical University
 Rawalpindi

Rawalpindi Medical University Rawalpindi
Department of Anatomy, Physiology & Biochemistry
SEQ & SAQ Paper for _____ Module, _____ Year MBBS Batch _____
Date: 00-00-0000

Total Marks: 70
Each SAQ carries 5 marks
Each SEQ carries 9 marks

Time allowed: 1 hour & 30 minutes
Each SAQ: 5 minutes, SEQ: 10 minutes
Attempt all Questions

RMU-12 Integrated Modular Curriculum 2026 Isolation to Beyond Boundaries Integrated Modular Assessment of the Subject Anatomy, Physiology & Biochemistry					
Integration			Percentage		
• Complimentary Integration (Theme Based) of Anatomy/Physiology Biochemistry (CI)			(70%)		
• Integration			(30%)		
○ Multidisciplinary Integration (MI)			(05%)		
○ Interdisciplinary (II)/Transdisciplinary Integration (TI)			(15%)		
○ C ³ 6 Assessment			(10%)		
Q.#	Construct your Answers according to the given Scenarios and Questions	Domain	Marks	% Weightage	Level of Cognition
Short Answer Questions (SAQs) Total Marks: 25 (Each SAQ carries marks)					
SA Q 1	A 55 years Male, known case of Coronary Artery Disease, presented to.....	CI & TI	.....	.....	.....
	a.	CI	2	8%	C2
	b.	CI	2	12%	C2

					
	c.	CI	2	8%	C2
	d.	CI	2	12%	C2
	e. USMLE Question. References: Part a: Guyton & Hall 14 th Edition page # 114 Part b: Guyton & Hall 14 th Edition Page # 116	CI	1	8%	C2
Short Essay Question (SEQs) Total Marks: 45					
SEQ 1	A 55 years Male, known case of Coronary Artery Disease, presented to.....	CI & TI	.....	.....	..... ...
	a.	MI with Anatomy	2	6.66%	C4
	b.	CI	3	6.66%	C2
	c.	CI	2	6.66%	C2
	d.	CI	1	6.66%	C2
	e. USMLE Style Question. References: • Part a: Guyton & Hall 14 th Edition page # 101	CI	1	6.66%	C2

	• Part b: Guyton & Hall 14th Edition Page # 103 • Part c: Guyton & Hall 14th Edition Page # 103				
--	---	--	--	--	--

Rawalpindi Medical University Rawalpindi
Department of Anatomy / Physiology / Biochemistry
Clinically Oriented Audio Visual Objective Structured Practical Examination (OSPE)
_____ Module 2026

_____ Year MBBS (Batch _____)

Day: _____

Date: _____

10 AV OSPE Slides

Time Allowed: 50 minutes

05 minutes for each slide

Chairperson

Department of _____
Rawalpindi Medical University, Rawalpindi

Additional Director Assessment

Rawalpindi Medical University
Rawalpindi

Director DME

Rawalpindi Medical University
Rawalpindi

Vice Chancellor

Rawalpindi Medical University
Rawalpindi

Slide 1

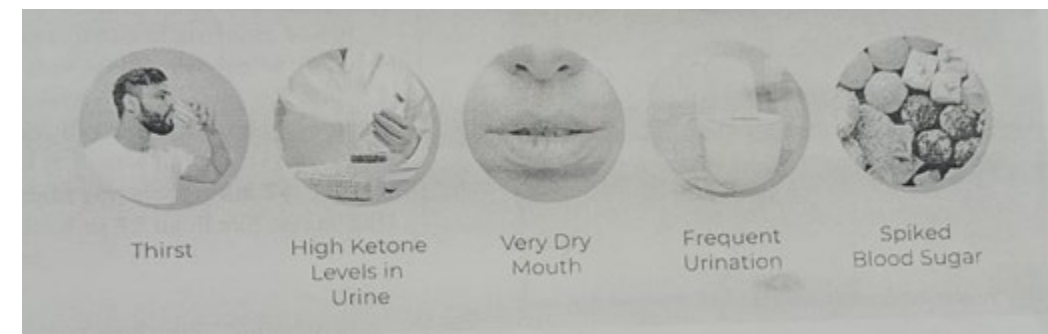
Core Knowledge with Horizontal / Vertical / Spiral Integration

Topic:

Teaching Strategy:

Requirements: Answer sheet, Pen

Objective: _____



- | | |
|---------|------|
| 1. | (01) |
| 2. | (01) |
| 3. | (01) |
| 4. | (01) |
| 5. | (01) |

Slide 1

Key for Examiner

- | |
|---------|
| 1. |
| 2. |
| 3. |
| 4. |
| 5. |

Department of Anatomy
CNS Module-I (Structured Viva)

Date:

Time: 8:00-2:00pm

Roll no: 181 onwards

P: Punctuality, D: Dressing, C: Communication

[illegible]

Examiner _____
Sign _____
Stamp _____

***Objective Structured Practical Examination (OSPE) will be held in end of block assessment.**

Department of Physiology
CNS Module-I (Structured Viva)

MODULE: _____ **DATE:** _____ **TEACHER NAME:** _____ **SIGNATURE** _____

[illegible]

***Objective Structured Practical Examination (OSPE) will be held in end of block assessment.**

Department of Biochemistry
CNS Module-I (Structured Viva)

Date:

Time:

Teacher's Name

[illegible]

***Objective Structured Practical Examination (OSPE) will be held in end of block assessment.**

Rawalpindi Medical University
2nd Year MBBS Model MCQS (USMLE Format)

1. A 75-year-old female suffered a stroke that produced loss of pain and temperature sensations from the left side of her face (along her forehead, cheek, and jaw). She had no other sensory or motor losses. Her physician advised MRI of brain to rule out the cause. Which structure is most likely to be suffered? a. Left medial lemniscus b. Right spinal trigeminal nucleus c. Left spinothalamic tract d. Right spinothalamic tract e. Left spinal trigeminal nucleus	Anatomy
2. A 62-year-old male is evaluated by a neurologist after a stroke. The doctor observed defect in sequencing & coordination of motor activities. The organ damaged is: a. Cerebellum b. Medulla c. Cortical motor strip d. Pons e. Eighth cranial nerve	Physiology
3. A 55-year-old male patient presents with elevated cholesterol levels. Laboratory tests reveal increased LDL cholesterol and total cholesterol levels. Which of the following enzymes is primarily responsible for the regulation of cholesterol synthesis? a. HMG-CoA reductase b. Acetyl-CoA carboxylase c. Fatty acid synthase d. Lipoprotein lipase e. Phosphatidate phosphatase	Biochemistry

Rawalpindi Medical University
2nd Year MBBS Model EMQ

Theme: Parkinsonism

Instructions:

For each of the following clinical scenarios, choose the most appropriate option from the list below. Each option may be used once, more than once, or not at all.

Options:

- A. Levodopa-Carbidopa
- B. Parkinson's disease
- C. Progressive Supranuclear Palsy
- D. Multiple System Atrophy
- E. Drug-induced Parkinsonism
- F. Wilson's Disease
- G. Resting tremor
- H. Essential tremor
- I. Rigidity
- J. Deep Brain Stimulation

Scenarios:

A 65-year-old man presents with resting tremor, bradykinesia, and cogwheel rigidity. He has a shuffling gait and responds well to levodopa.

A 72-year-old woman has Parkinsonian features, but her eye movements, especially vertical gaze, are impaired. She also has early postural instability and falls.

A 30-year-old man presents with rigidity, tremor, and psychiatric symptoms. His serum ceruloplasmin is low and slit-lamp examination reveals Kayser-Fleischer rings.

A 55-year-old man is being treated with haloperidol for schizophrenia. He now shows bradykinesia, rigidity, and masked facies.

A 68-year-old man with Parkinson's disease has severe motor fluctuations despite optimal medical therapy. Surgical therapy is being considered.

Answers:

- B. Parkinson's disease
- C. Progressive Supranuclear Palsy
- F. Wilson's Disease
- E. Drug-induced Parkinsonism
- J. Deep Brain Stimulation

Rawalpindi Medical University
2nd Year MBBS Model SEQs & SAQs (USMLE Format)

1. A 45-year-old man was brought to the outpatient department by his family with complaints of progressive weakness and difficulty in walking. His relatives report that he had a respiratory infection about three weeks ago. Neurological examination shows areflexia and symmetrical ascending muscle weakness. Nerve conduction studies reveal slowed conduction velocity. He is diagnosed with Guillain-Barré Syndrome. - Which of the following best describes the primary pathophysiologic mechanism underlying this patient's condition? - Which organism is most commonly associated with the development of Guillain-Barré Syndrome? - A cross-section of the affected peripheral nerve in this condition would most likely show which of the following histological findings? - What change would most likely be observed in nerve conduction studies of this patient? - Which of the following best describes the typical clinical progression of Guillain-Barré Syndrome?	Anatomy
2. A 50-year-old man presents to the neurology clinic with complaints of imbalance, slurred speech, and difficulty with coordinated movements. He has a history of chronic alcohol use. On neurological examination: He is ataxic and unable to perform rapid alternating movements. His heel-to-shin test is impaired on the right side. When testing the knee jerk, the leg swings back and forth several times like a pendulum before coming to rest. No significant muscle weakness is noted. MRI shows cerebellar atrophy, most prominent in the anterior lobe - Which of the following best explains why the patient's knee jerk shows a pendular response? - Which of the following best distinguishes a pendular reflex from a normal knee jerk reflex? - Which of the following cerebellar functions is most directly involved in controlling the normal damping of stretch reflexes like the knee jerk? - Damage to which cerebellar structure is most likely responsible for the patient's symptoms, particularly the hypotonia and pendular reflex? - Which of the following additional clinical signs would most likely be found in this patient with cerebellar dysfunction?	Physiology
3. A 16-year-old boy presents with abdominal pain, recurrent episodes of pancreatitis, and milky plasma on blood draw. He has no significant past medical history. On physical examination, small yellowish nodules are noted on the extensor surfaces of the arms and back. His fasting lipid profile shows: Triglycerides: 2,800 mg/dL (Normal: <150 mg/dL), Cholesterol: Mildly elevated, LDL: Normal, HDL: Low, Genetic testing reveals a loss-of-function mutation in the lipoprotein lipase (LPL) gene - Which of the following lipoproteins is most likely elevated in this patient? - Which of the following enzymes is primarily responsible for hydrolyzing triglycerides in chylomicrons in peripheral tissues? - Which apolipoprotein is required to activate lipoprotein lipase for the metabolism of chylomicrons? - Which apolipoprotein is required to activate lipoprotein lipase for the metabolism of chylomicrons? - The patient's eruptive xanthomas are most likely caused by which of the following?	Biochemistry

Rawalpindi Medical University
2nd Year MBBS Model AV OSPE

Slide 1 / Video

Core Knowledge with Horizontal / Vertical / Spiral Integration

Topic: Parkinsonism

Teaching Strategy: LGIS, SGD

Requirements: Answer sheet, Pen

Objective: To Assess the Knowledge of Students Regarding Parkinsonism.



- | | |
|---|------|
| 1. What is the most likely diagnosis? | (01) |
| 2. Name the classic clinical triad of this condition. | (01) |
| 3. Mention one neurotransmitter that is deficient in this disease. | (01) |
| 4. Name one pharmacological treatment option and its mechanism of action. | (01) |
| 5. List one complication of long-term pharmacological therapy. | (01) |

Rawalpindi Medical University
2nd Year MBBS OSPE (Block-IV)

Observed Station ____

Marks: 05

Time Allowed: 03 Minutes

Subject: CNS
Topic assessed: Signs of Parkinsonism
Requirements: Simulated Patient
Objective: Signs of Parkinsonism

For Candidate:	Learning domain	Marks
You are a second-year MBBS student assigned to examine a 65-year-old male patient who presents with slowness of movement and stiffness in limbs.	Psychomotor (C1)	5 Marks

Task: Perform a focused motor examination to identify signs suggestive of Parkinsonism.

Key

Step	Task	Mark
1	Introduces self and explains procedure to patient	0.5
2	Washes hands/sanitizes and ensures patient comfort	0.5
3	Inspects for tremor at rest (e.g., hands resting on lap)	1
4	Checks for cogwheel rigidity at wrist/elbow with passive movement	1
5	Assesses bradykinesia (ask patient to do finger tapping or open-close fist rapidly)	1
6	Observes gait (shuffling, stooped posture, reduced arm swing)	1

Marks: 05

Time Allowed: 03 Minutes

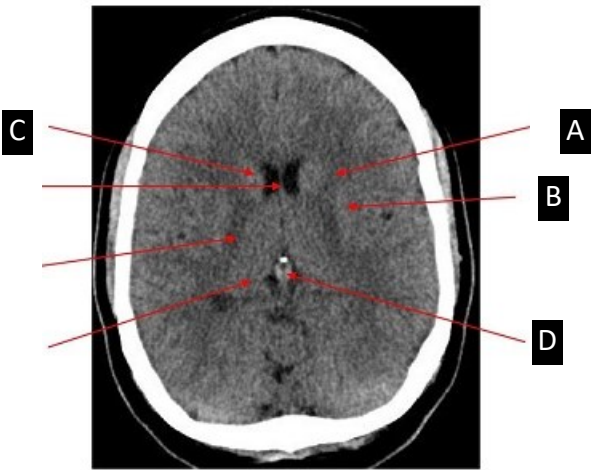
Subject: Brain CT (Radiology)
Topic assessed: Radiology of CNS
Requirements: Image of CT Scan
Objective: Evaluate the students' understanding of CT

A 30-year-old male is brought to the hospital with severe right upper quadrant pain. A CT scan of the abdomen is performed to assess possible causes.

For Candidate

Identify the labeled abdominal organs on the given CT scan as

- 1. A
- 2. B
- 3. C
- 4. D
- 5. Why is **contrast-enhanced CT** preferred in Stoke cases?



CNS Module-I Entrustable Professional Activities (EPAs)

Theme I

A patient with Sensory Loss, Numbness & Cranial Trauma-Related Symptoms

EPA 1: Obtain a Focused History in a Patient with Cranial Trauma

EPA Component	Detailed Description
1. Title of the EPA	Obtain a focused history in a patient presenting with cranial trauma and suspected skull base injury.
2. Specifications and limitations	This EPA includes the ability of the student to obtain a relevant and focused history from the patient and/or attendants in a case of head injury. The student should be able to ask about: • Time, place and mechanism of trauma • Mode of injury, such as road traffic accident, fall, assault or sports injury • Use of helmet or protective measures • Site of impact on the head • Loss of consciousness and its duration • Vomiting, headache, dizziness or seizures after trauma • Watery discharge from nose or ear suggestive of CSF leak • Bleeding from nose, ear or scalp wound • Altered smell, vision, hearing or speech • Facial numbness, limb numbness, tingling or weakness • Neck pain or stiffness • Confusion, drowsiness or behavioral change • Previous history of head injury, epilepsy or neurological illness • Drug history, especially anticoagulants, antiplatelets, sedatives or alcohol/substance use Limitations: • Student should not independently discharge the patient. • Student should not ignore red-flag symptoms even if the patient appears stable. • Student should not perform unsafe manipulation of nose, ear or neck in suspected skull base or cervical

	spine injury. • Final diagnosis and definitive management must be done by a senior clinician.
3. Most relevant domains of competence	Medical Expert: Identifies key symptoms and red flags of cranial trauma. Communicator: Takes history respectfully from patient and attendants. Collaborator: Shares urgent findings with senior/team. Professional: Maintains patient dignity and confidentiality. Health Advocate: Recognizes helmet use and injury prevention counseling.
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge: • Basic anatomy of skull, cranial fossae and meninges • Anatomical basis of CSF rhinorrhea • Cranial nerves involved in smell and facial sensation • Ascending sensory pathways relevant to numbness and tingling • Red flags in head injury, including CSF leak, repeated vomiting, worsening headache, altered consciousness, seizures and focal neurological deficit Skills: • Take focused trauma history in chronological order • Obtain collateral history from attendants when patient is confused or drowsy • Identify symptoms suggesting skull base fracture or intracranial complication • Differentiate minor symptoms from emergency warning signs • Summarize and present history clearly to supervisor • Document important positive and negative findings Attitude and behaviour: • Shows empathy toward a frightened or painful patient • Maintains calm and organized approach in emergency setting • Recognizes personal limitations and calls for help early • Avoids reassurance without proper assessment • Communicates warning signs to attendants in simple language
5. Assessment information sources to assess progress and ground a summative entrustment decision	• Direct observation in emergency/ward setting • Mini-CEX on focused head injury history • OSCE station on cranial trauma history • Case-based discussion • Logbook entry of observed head injury case • Supervisor feedback • Structured checklist for red-flag identification • Oral viva on clinical significance of CSF rhinorrhea and sensory loss

6. Entrustment for which level of supervision is to be reached at which stage of training	Expected level by end of CNS Module-I: Student should be able to obtain a focused history and identify red-flag symptoms under direct supervision. Entrustment decision: • Level 1: Observes history taking only • Level 2: Takes history with direct supervision • Level 3: Takes focused history with indirect supervision and reports findings promptly For undergraduate CNS module, the desirable level is Level 2 progressing toward Level 3.
7. Expiration date	One year without relevant clinical practice or reassessment.

EPA 2: Perform Structured Neurological and Cranial Nerve Examination in Cranial Trauma

EPA Component	Detailed Description
1. Title of the EPA	Perform a structured neurological and cranial nerve examination in a patient with cranial trauma.
2. Specifications and limitations	This EPA includes the ability of the student to perform a safe, relevant and structured neurological examination in a patient with suspected cranial trauma and skull base involvement. The student should be able to assess: • General appearance and level of consciousness • Vital signs and overall stability • Scalp, face and periorbital region for bruising or trauma signs • Watery nasal or ear discharge suggestive of CSF leak • Pupillary size and reaction to light • Sense of smell where clinically appropriate and safe • Facial sensation in trigeminal nerve distribution • Basic cranial nerve screening • Motor power in all four limbs • Sensory testing including fine touch and pinprick • Reflexes and plantar response where appropriate • Neck stiffness or meningeal irritation, without forceful manipulation Limitations: • Student should not perform painful or forceful neck movement in suspected cervical spine injury. • Student should not insert anything into nose or ear to confirm CSF leak.

	• Student should not delay referral or imaging in order to complete a full examination. • Student should not independently interpret complex neurological deficits without supervision.
3. Most relevant domains of competence	Medical Expert: Performs focused neurological and cranial nerve examination. Communicator: Explains examination steps to patient. Professional: Ensures privacy, consent and patient comfort. Collaborator: Reports abnormal neurological findings to senior clinician. Manager: Prioritizes emergency signs and avoids unnecessary delay.
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge: • Anatomy of cranial nerves, especially olfactory and trigeminal nerves • Sensory distribution of face and limbs • Basic ascending sensory pathways • Meninges and clinical relevance of meningeal irritation • Signs of raised intracranial pressure and intracranial bleeding • Relationship of skull base injury with CSF rhinorrhea, anosmia and cranial nerve symptoms Skills: • Perform examination in a logical sequence • Assess level of consciousness and orientation • Examine pupils safely • Test facial sensation and limb sensation • Screen cranial nerves relevant to trauma • Assess motor power and gross neurological deficits • Identify meningeal signs carefully • Recognize abnormal findings and communicate them clearly • Document examination findings accurately Attitude and behaviour: • Handles patient gently and avoids worsening pain • Maintains patient safety throughout examination • Takes consent before examination • Demonstrates respect and reassurance • Escalates immediately when neurological deficit is detected
5. Assessment information sources to assess progress and ground a summative entrustment decision	• Direct observation of neurological examination • OSCE station on cranial nerve and sensory examination • Mini-CEX during ward/emergency clinical teaching • Checklist-based neurological examination assessment • Case-based discussion on localization of sensory loss • Supervisor feedback

	• Logbook documentation • Viva on cranial nerves, sensory pathways and signs of meningeal irritation
6. Entrustment for which level of supervision is to be reached at which stage of training	Expected level by end of CNS Module-I: Student should be able to perform a basic structured neurological and cranial nerve examination under direct supervision and correctly report abnormal findings. Entrustment decision: • Level 1: Observes neurological examination • Level 2: Performs examination under direct supervision • Level 3: Performs focused examination independently but discusses findings with supervisor For undergraduate CNS module, the desirable level is Level 2 progressing toward Level 3.
7. Expiration date	One year without relevant clinical practice or reassessment.

EPA 3: Recognize the Need for Urgent Imaging, Referral and Early Supportive Management

EPA Component	Detailed Description
1. Title of the EPA	Recognize and initiate supervised care pathway for suspected skull base injury or intracranial complication.
2. Specifications and limitations	This EPA includes the ability of the student to recognize emergency features in cranial trauma and understand the need for urgent imaging, referral and early supportive management. The student should be able to recognize the importance of: • CSF rhinorrhea after head injury • Persistent severe headache • Repeated vomiting • Anosmia after frontal head trauma • Facial numbness or limb sensory loss • Neck stiffness or meningeal irritation • Altered consciousness or increasing drowsiness • Seizures after trauma • Focal neurological deficit • Signs suggesting intracranial hemorrhage or raised intracranial pressure The student should understand that such a patient requires: • Urgent senior review • Monitoring of vital signs and neurological status • CT brain/skull base imaging where indicated

	• Safe referral to emergency/neurosurgical team • Pain control under supervision • Avoidance of nasal probing, nasal packing or unnecessary manipulation • Counseling of attendants regarding danger signs Limitations: • Student should not independently order definitive treatment or discharge. • Student should not perform invasive procedures. • Student should not independently clear cervical spine injury. • Student should not delay referral while waiting for complete theoretical confirmation. • Student should work within supervised undergraduate role.
3. Most relevant domains of competence	Medical Expert: Recognizes skull base injury and intracranial complication warning signs. Collaborator: Refers urgently to senior/emergency/neurosurgical team. Communicator: Explains seriousness and warning signs to attendants. Professional: Acts responsibly within limits of competence. Health Advocate: Counsels regarding helmet use and prevention of head injury. Manager: Prioritizes urgent imaging and safe patient pathway.
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge: • Basic pathology of cranial trauma • Skull base fracture and meningeal injury • CSF leak and risk of infection • Intracranial hemorrhage and raised intracranial pressure • Indications for urgent CT scan in head injury • Principles of early supportive care in neurological emergencies • Warning signs requiring immediate escalation Skills: • Identify red-flag clinical features • Prioritize ABC and patient safety • Monitor vital signs and neurological status under supervision • Communicate urgent concern to senior clinician • Prepare clear referral or handover using structured format • Counsel patient/attendants about warning signs • Document clinical concerns and escalation clearly Attitude and behaviour: • Demonstrates urgency without panic • Accepts responsibility for timely escalation

	• Works within competence and seeks supervision • Maintains patient-centered approach • Avoids harmful or unnecessary interventions • Shows respect and reassurance to patient and family
5. Assessment information sources to assess progress and ground a summative entrustment decision	• Case-based discussion on suspected skull base fracture • Simulation of emergency head injury scenario • OSCE station on recognition and referral of neurological emergency • Direct observation during emergency/ward posting • Structured handover/referral assessment • Logbook record of observed emergency case • Supervisor feedback • Viva on CT indications, red flags and early supportive management
6. Entrustment for which level of supervision is to be reached at which stage of training	Expected level by end of CNS Module-I: Student should be able to recognize suspected skull base injury or intracranial complication and initiate urgent referral pathway under direct supervision. Entrustment decision: • Level 1: Observes recognition and referral process • Level 2: Identifies emergency features and reports under direct supervision • Level 3: Recognizes emergency independently and immediately informs senior for supervised management For undergraduate CNS module, the desirable level is Level 2 progressing toward Level 3.
7. Expiration date	One year without relevant clinical practice or reassessment.

EPA 1 (Developed on Attached Format)

Theme II – Altered Consciousness, Raised ICP & CNS Infection Presentations

Example of EPA developed for CNS Theme II	Example of EPA developed for CNS Theme II
1. Title of the EPA	Focused history in a patient with fever, headache, vomiting, and altered consciousness with identification of red-flag symptoms suggestive of CNS infection or raised intracranial pressure.
2. Specification and limitations	This EPA includes no more and no less than: 1. Obtaining a focused history in a patient presenting with fever, headache, vomiting, and altered consciousness, while identifying red-flag symptoms suggestive of meningitis, encephalitis, or raised intracranial pressure. 2. Eliciting key associated features such as neck stiffness, photophobia, seizures, focal neurological deficit, rash, recent infection, immunocompromised state, or rapid deterioration. 3. Recognizing the urgency of the presentation and communicating the need for immediate stabilization, further evaluation, and senior review. Context: emergency department / acute care / supervised undergraduate clinical setting. Targeted transition point: end of pre-clinical CNS module moving toward early clinical clerkship. Limitations: learner is expected to recognize and escalate; independent definitive management is not expected.
3. Most relevant domains of competence	☒ Medical Expert ☐ Health Advocate ☒ Communicator ☐ Scholar ☒ Collaborator ☒ Professional ☐ Manager
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge – clinical features of meningitis, encephalitis, and raised intracranial pressure – causes of fever with altered consciousness in CNS practice – red-flag symptoms including persistent vomiting, seizures, photophobia, neck stiffness, and focal deficits Skill – focused history taking in an acutely ill neurological patient – identification of red-flag symptoms and relevant associated history – prioritization of urgent concerns and concise verbal case presentation – communication of urgency to the supervising team Attitude and behaviour – calm, urgent, and professional approach in acute settings – respect for patient safety, dignity, and confidentiality – awareness of limits of competence and timely escalation

	Experience – participation in at least two supervised case discussions / CBLs on meningitis, encephalitis, or raised intracranial pressure – observed history taking in at least one simulated or clinical patient with acute neurological presentation
5. Assessment information sources to assess progress and ground a summative entrustment decision	Observation: direct observation of focused history taking and red-flag identification using checklist / mini-CEX. Case-based discussions: one or more CBDs on suspected CNS infection, altered consciousness, or raised ICP. Indirect supervision: review of learner’s prioritization of urgency, differential thinking, and clarity of communication before summative entrustment decision.
6. Entrustment for which level of supervision is to be reached at which stage of training?	Supervision level to be reached: the learner should be able to perform this EPA under direct to indirect supervision, with immediate access to a supervisor for confirmation and escalation. Stage of training: by the end of the CNS module / before transition to early clinical clerkship.
7. Expiration date	One year without practice, or earlier if not reinforced during clinical rotations.

EPA 2 (Developed on Attached Format)

Theme II – Altered Consciousness, Raised ICP & CNS Infection Presentations

Example of EPA developed for CNS Theme II	Example of EPA developed for CNS Theme II
1. Title of the EPA	Structured neurological examination including mental status, meningeal signs, and basic cranial nerve assessment in a patient with suspected CNS infection or raised intracranial pressure.
2. Specification and limitations	This EPA includes no more and no less than: 1. Performing a structured neurological examination in a patient with fever, headache, vomiting, and altered consciousness, including assessment of mental status, level of consciousness, orientation, and gross motor response. 2. Examining for meningeal signs such as neck stiffness and other relevant bedside findings suggestive of meningeal irritation. 3. Conducting a basic cranial nerve examination to identify visual, pupillary, ocular movement, facial, or bulbar abnormalities and communicating findings accurately to the supervising team. Context: emergency department / acute care / supervised undergraduate clinical setting. Targeted transition point: end of pre-clinical CNS module moving toward early clinical clerkship. Limitations: learner is expected to examine, identify abnormal findings, and report them appropriately; definitive neurological diagnosis and independent management are not expected.
3. Most relevant domains of competence	☒ Medical Expert ☐ Health Advocate ☒ Communicator ☐ Scholar ☒ Collaborator ☒ Professional ☐ Manager
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge – meninges, CSF pathways, and basic neuroanatomy relevant to raised ICP and meningeal irritation – components of mental status assessment and level of consciousness – common cranial nerve findings in CNS infection or intracranial pathology Skill – structured neurological examination in an acutely ill patient – examination for meningeal signs and basic cranial nerve assessment – recognition of abnormal mental status, focal neurological deficits, and warning signs – concise documentation and verbal presentation of examination findings Attitude and behaviour

	– respectful patient interaction with attention to comfort and safety – infection-aware and professional bedside conduct – honesty in reporting findings and limitations of examination Experience – participation in supervised examination demonstrations during CNS module sessions – observed practice of at least one complete neurological examination in simulation or clinical setting
5. Assessment information sources to assess progress and ground a summative entrustment decision	Observation: direct observation of neurological examination, meningeal sign assessment, and basic cranial nerve examination using checklist / mini-CEX. Case-based discussions: one or more CBDs focused on localization, altered mental status, or suspected meningeal involvement. Indirect supervision: review of examination findings, interpretation, and clarity of case presentation before summative entrustment decision.
6. Entrustment for which level of supervision is to be reached at which stage of training?	Supervision level to be reached: the learner should be able to perform this EPA under direct supervision, with partial indirect supervision for reporting findings and immediate access to a supervisor. Stage of training: by the end of the CNS module / before transition to early clinical clerkship.
7. Expiration date	One year without practice, or earlier if clinical examination skills are not reinforced.

EPA 3 (Developed on Attached Format)

Theme II – Altered Consciousness, Raised ICP & CNS Infection Presentations

Example of EPA developed for CNS Theme II	Example of EPA developed for CNS Theme II
1. Title of the EPA	Recognition of urgent stabilization, neuroimaging when indicated, timely referral, and early empiric management in a patient with suspected meningitis.
2. Specification and limitations	This EPA includes no more and no less than: 1. Recognizing a patient with suspected meningitis or raised intracranial pressure as a medical emergency requiring urgent stabilization and senior review. 2. Identifying when neuroimaging may be indicated before lumbar puncture, especially in the presence of altered consciousness, focal neurological deficits, papilledema, or seizures. 3. Recommending timely referral and early empiric management, including prompt supportive care, infection-control awareness, and urgent antimicrobial treatment as directed by the supervising team. Context: emergency department / acute care / supervised undergraduate clinical setting. Targeted transition point: end of pre-clinical CNS module moving toward early clinical clerkship. Limitations: learner is expected to recognize urgency, communicate clearly, and initiate escalation; independent ordering authority or definitive emergency management is not expected.

3. Most relevant domains of competence	☒ Medical Expert ☐ Health Advocate ☒ Communicator ☐ Scholar ☒ Collaborator ☒ Professional ☐ Manager
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge – principles of initial stabilization in altered consciousness and suspected CNS infection – indications for neuroimaging before lumbar puncture – importance of early empiric therapy and timely referral in meningitis Skill – recognition of emergency warning signs requiring urgent stabilization and escalation – communication of urgency, referral need, and immediate priorities to the supervisor and team – identification of cases where imaging is indicated before lumbar puncture – clear documentation of findings, concerns, and actions taken Attitude and behaviour – strong commitment to patient safety and time-critical care – professional responsibility, teamwork, and calm decision-making under pressure – prompt escalation without delay when life-threatening infection is suspected Experience – participation in at least two case discussions involving meningitis, encephalitis, or raised intracranial pressure – observed involvement in one simulated or supervised acute-referral scenario
5. Assessment information sources to assess progress and ground a summative entrustment decision	Observation: direct observation of recognition of urgent warning signs, stabilization priorities, and communication of referral plan. Case-based discussions: one or more CBDs on suspected meningitis requiring urgent escalation and early empiric management. Indirect supervision: review of learner’s prioritization of imaging, referral, and supportive steps before summative entrustment decision.
6. Entrustment for which level of supervision is to be reached at which stage of training?	Supervision level to be reached: the learner should be able to recognize the urgent scenario and initiate escalation under direct to indirect supervision, with all definitive decisions confirmed by a supervisor. Stage of training: by the end of the CNS module / before transition to early clinical clerkship.
7. Expiration date	One year without practice, or earlier if acute-care reasoning is not reinforced.

Theme III – Epileptic Seizures, Involuntary Movements & Motor Control Disorders

Example of EPA developed for CNS Theme III	Example of EPA developed for CNS Theme III
1. Title of the EPA	Focused history in a patient presenting with seizure, including eyewitness account, triggers, post-ictal symptoms, and previous episodes.
2. Specification and limitations	This EPA includes no more and no less than: 1. Obtaining a focused history in a patient presenting after a seizure, including onset, duration, type of movements, loss of consciousness, tongue bite, urinary incontinence, and recovery pattern. 2. Eliciting an eyewitness account to clarify seizure semiology, associated automatisms, eye deviation, cyanosis, falls, or focal onset features. 3. Identifying possible triggers such as sleep deprivation, fever, missed medications, flashing lights, substance use, head injury, or metabolic disturbance. 4. Asking about post-ictal confusion, weakness, headache, prior episodes, drug history, and family history of seizures. Context: emergency department / outpatient neurology / supervised undergraduate clinical setting. Targeted transition point: end of pre-clinical CNS module moving toward early clinical clerkship. Limitations: learner is expected to obtain and summarize history, recognize urgency, and escalate appropriately; independent diagnosis and definitive treatment are not expected.
3. Most relevant domains of competence	☒ Medical Expert ☐ Health Advocate ☒ Communicator ☐ Scholar ☒ Collaborator ☒ Professional ☐ Manager
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge – definition and broad classification of seizures – common seizure triggers and provoking factors – components of an eyewitness seizure history – post-ictal features and red flags suggesting secondary seizure cause Skill – focused seizure history taking from patient and witness – identification of features suggesting generalized versus focal onset – recognition of urgent red flags and concise case presentation – documentation of relevant past, drug, and family history

	Attitude and behaviour – calm, respectful, and non-judgmental approach – sensitivity toward frightened patients and family members – respect for confidentiality and patient safety – awareness of limits of competence and timely escalation Experience – participation in at least two supervised case discussions / CBLs on seizure disorders – observed focused history taking in at least one simulated or clinical seizure case
5. Assessment information sources to assess progress and ground a summative entrustment decision	Observation: direct observation of focused seizure history taking and synthesis using checklist / mini-CEX. Case-based discussion: differentiation of seizure type, triggers, and red flags with supervisor. Documentation review: quality of written seizure history, witness account, and urgency recognition. Simulation / OSCE: seizure-history station with standardized patient or relative.
6. Entrustment for which level of supervision is to be reached at which stage of training?	Supervision level to be reached: the learner should be able to perform this EPA under direct to indirect supervision, with the supervisor available and validating findings. Expected stage: by the end of the CNS module / early clinical exposure.
7. Expiration date	One year without practice, or earlier if seizure history-taking is not reinforced during clinical rotations.

Theme III – Epileptic Seizures, Involuntary Movements & Motor Control Disorders

Example of EPA developed for CNS Theme III	Example of EPA developed for CNS Theme III
1. Title of the EPA	Structured neurological examination after seizure recovery with identification of focal neurological deficit or signs suggesting a secondary cause.
2. Specification and limitations	This EPA includes no more and no less than: 1. Performing a structured neurological examination after the patient has recovered sufficiently from a seizure. 2. Assessing mental status, orientation, speech, higher functions, motor power, tone, reflexes, plantar response, coordination, gait when appropriate, and sensory examination at a basic level. 3. Examining for focal neurological deficit such as hemiparesis, aphasia, cranial nerve signs, or post-ictal Todd’s paralysis. 4. Identifying clues to secondary causes such as fever, neck stiffness, head trauma, papilledema, meningeal irritation, or persistent altered consciousness. Context: ward / emergency / simulation / supervised undergraduate clinical setting. Targeted transition point: end of CNS module and early supervised clinical exposure. Limitations: learner performs basic examination and recognizes abnormal findings requiring escalation; advanced localization and independent management are not expected.
3. Most relevant domains of competence	☒ Medical Expert ☐ Health Advocate ☒ Communicator ☐ Scholar ☒ Collaborator ☒ Professional ☐ Manager
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge – basic neurological examination after seizure recovery – common focal deficits after seizure, including Todd’s paralysis – red flags suggesting structural, infectious, or metabolic secondary causes – importance of timing examination after stabilization and recovery Skill – structured neurological examination after seizure recovery – assessment of mental status and focal deficits – identification of signs requiring urgent escalation – concise presentation of examination findings to supervisor Attitude and behaviour

	– patient-centered and reassuring examination approach – maintenance of dignity and safety in a post-ictal patient – careful observation and professionalism in acute settings – recognition of need for supervision when abnormal findings are present Experience – practice of basic CNS examination in skills lab / bedside teaching – observed examination of at least one patient or simulated case after seizure recovery
5. Assessment information sources to assess progress and ground a summative entrustment decision	Observation: direct observation of neurological examination after seizure recovery using checklist / mini-CEX. Case-based discussion: interpretation of focal findings and consideration of secondary causes. OSCE / simulation: structured post-seizure neurological examination station. Documentation review: clarity and completeness of recorded examination findings.
6. Entrustment for which level of supervision is to be reached at which stage of training?	Supervision level to be reached: the learner should be able to perform this EPA under direct supervision, with the supervisor confirming neurological findings and interpretation. Expected stage: by the end of the CNS module / early clinical exposure.
7. Expiration date	One year without practice, or earlier if neurological examination skills are not reinforced.

Theme III – Epileptic Seizures, Involuntary Movements & Motor Control Disorders

Example of EPA developed for CNS Theme III	Example of EPA developed for CNS Theme III
1. Title of the EPA	Recognition of the need for urgent stabilization, appropriate referral, and counseling regarding seizure precautions and trigger avoidance.
2. Specification and limitations	This EPA includes no more and no less than: 1. Recognizing the need for urgent stabilization in a patient with ongoing seizure activity, repeated seizures, prolonged post-ictal state, airway compromise, or suspected secondary cause. 2. Identifying when referral for urgent neuroimaging, laboratory workup, and specialist review is required. 3. Communicating seizure precautions clearly, including advice regarding driving, swimming, heights, machinery, and supervision until medical review. 4. Counseling the patient and family regarding trigger avoidance such as sleep deprivation, missed medication, alcohol/substance use, and poor adherence to follow-up. Context: emergency / acute neurology / supervised undergraduate clinical setting. Targeted transition point: readiness for early clinical entrustment under supervision. Limitations: learner is expected to recognize and escalate, provide basic counseling, and assist in referral; independent prescription or unsupervised acute management is not expected.
3. Most relevant domains of competence	☒ Medical Expert ☐ Health Advocate ☒ Communicator ☐ Scholar ☒ Collaborator ☒ Professional ☐ Manager
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge – principles of initial stabilization in seizure and post-seizure states – indications for urgent referral and neuroimaging – seizure precautions and common trigger factors – importance of follow-up and adherence in seizure care Skill – recognition of emergency features such as status epilepticus, recurrent seizures,

	focal deficit, head injury, or persistent altered consciousness – verbal handover and escalation to senior team – basic counseling regarding safety precautions and trigger avoidance – communication with patient and attendants in clear, simple language Attitude and behaviour – urgency with composure in acute scenarios – commitment to patient safety and prevention of harm – supportive, empathetic counseling style – awareness of professional limitations and timely referral Experience – participation in supervised discussion of acute seizure management – observation of counseling on seizure precautions in simulated or clinical setting
5. Assessment information sources to assess progress and ground a summative entrustment decision	Observation: direct observation of recognition of urgent warning signs, escalation, and counseling. Case-based discussion: prioritization of stabilization, referral, imaging, and safety advice. Simulation / OSCE: acute seizure scenario with handover and counseling station. Multisource input: feedback from supervisor on professionalism, urgency, and clarity of communication.
6. Entrustment for which level of supervision is to be reached at which stage of training?	Supervision level to be reached: the learner should be able to recognize the urgent scenario, initiate escalation, and provide basic safety counseling under direct supervision. Expected stage: by the end of the CNS module / early clinical exposure.
7. Expiration date	One year without practice, or earlier if acute-care counseling and escalation skills are not reinforced.

Theme 4 Entrustable Professional Activities (EPAs)

Neurology: Suspected Cerebellar / Brainstem Pathology

EPA 1. Obtain a focused neurological history in a patient presenting with gait imbalance, speech disturbance, diplopia, and headache, and identify important red-flag symptoms.

Specification and limitations	• Elicit the presenting complaints in a structured manner, including onset, duration, progression, and associated symptoms. • Ask targeted questions about gait imbalance, vertigo, slurring of speech, double vision, headache, vomiting, dysphagia, limb weakness, sensory symptoms, and altered consciousness. • Identify important red-flag features such as sudden onset, severe or occipital headache, repeated vomiting, worsening imbalance, cranial nerve symptoms, altered mental state, seizures, and focal neurological deficits. • Explore relevant background history including trauma, hypertension, diabetes, stroke risk factors, infection, anticoagulant use, and past neurological illness. • Summarize the history and communicate concern for possible posterior fossa, cerebellar, or brainstem involvement. • Context: emergency, outpatient, or inpatient setting. • Limitations: does not include independent definitive diagnosis or interpretation of advanced neuroimaging.
Most relevant domains of competence	• Medical Expert • Communicator • Collaborator • Professional • Health Advocate
Required experience, knowledge, skills, attitude and behaviour	• Knowledge: basic anatomy and functions of cerebellum, brainstem, and cranial nerves; common causes of gait imbalance, diplopia, dysarthria, and headache; red-flag symptoms suggesting raised intracranial pressure, stroke, hemorrhage, infection, or posterior fossa lesion. • Skills: take a focused neurological history, recognize temporal progression, identify warning signs requiring urgent escalation, and present findings clearly. • Attitude and behaviour: maintain respectful communication, vigilance for warning signs, professionalism in urgent situations, and timely help-seeking. • Experience: focused neurological histories in at least 3–5 patients with neurological complaints under supervision.
Assessment information sources	• Direct observation during history taking • Case-based discussion

	• Mini-CEX • Supervisor feedback • Structured oral presentation of the case
Entrustment / supervision level	Level 3 (indirect supervision): the learner may obtain a focused neurological history and identify concerning features, with supervisor available and findings subsequently reviewed, by the end of the clerkship.
Expiration date	One year without practice after summative entrustment decision.

EPA 2. Perform a structured neurological examination including gait assessment, cerebellar signs, cranial nerve examination, and basic motor-sensory screening.

Specification and limitations	• Assess general neurological status and level of consciousness. • Perform gait assessment where safe, including stance, tandem walking, broad-based gait, and truncal instability. • Examine cerebellar signs such as dysdiadochokinesia, intention tremor, past pointing, rebound phenomenon, and heel-shin impairment. • Perform focused cranial nerve examination, especially eye movements, nystagmus, facial symmetry, bulbar signs if indicated, and speech quality. • Conduct basic motor and sensory screening including tone, power, reflexes, coordination, and sensory asymmetry. • Identify abnormal findings and communicate the need for urgent escalation when necessary. • Context: emergency room, ward, skills lab, or supervised clinical setting. • Limitations: does not include highly specialized neurological localization beyond undergraduate level; adapt examination if the patient is unstable or unsafe to mobilize.
Most relevant domains of competence	• Medical Expert • Communicator • Collaborator • Professional
Required experience, knowledge, skills, attitude and behaviour	• Knowledge: basic neurological examination sequence; cerebellar pathways and common cerebellar signs; cranial nerve functions relevant to diplopia, dysarthria, and swallowing. • Skills: perform a systematic neurological examination, assess gait safely, identify cerebellar dysfunction and cranial nerve abnormalities, and document/report findings clearly. • Attitude and behaviour: ensure patient dignity and safety, use a systematic approach, and stop the examination and seek help if instability or deterioration occurs.

	• Experience: neurological examination performed under supervision in at least 3–5 patients; demonstration of cerebellar and cranial nerve examination in clinical or simulated setting.
Assessment information sources	• Direct observation of procedural skills • Mini-CEX • Bedside assessment by supervisor • OSCE / long case • Case-based discussion
Entrustment / supervision level	Level 3 (indirect supervision): the learner may perform a focused neurological examination and identify major abnormal findings, with supervisor review, by the end of the clerkship.
Expiration date	One year without practice after summative entrustment decision.

EPA 3. Recognize the need for urgent neuroimaging, referral, and counseling in a patient with suspected cerebellar or brainstem pathology.

Specification and limitations	• Integrate key history and examination findings suggestive of serious posterior fossa or brainstem disease. • Identify indications for urgent neuroimaging, especially CT/MRI brain in the presence of acute focal deficits, progressive symptoms, severe headache, vomiting, altered consciousness, or suspected stroke / space-occupying lesion. • Recognize the need for urgent referral to a senior clinician, neurology, neurosurgery, or emergency services as appropriate. • Provide initial counseling to patient and family regarding seriousness of symptoms, need for urgent evaluation, fall precautions, and avoidance of delay. • Communicate findings and urgency clearly and professionally to the healthcare team. • Context: emergency, outpatient, inpatient, or acute care setting. • Limitations: does not include independent ordering of advanced investigations without institutional policy or supervisor approval; does not include definitive specialist management.
Most relevant domains of competence	• Medical Expert • Communicator • Collaborator • Health Advocate • Professional

Required experience, knowledge, skills, attitude and behaviour	• Knowledge: indications for urgent neuroimaging in focal neurological presentations; serious causes of cerebellar and brainstem signs, including stroke, hemorrhage, tumor, hydrocephalus, and infection. • Skills: recognize clinical urgency, synthesize history and examination into a focused impression, communicate urgency effectively to seniors and family, and counsel regarding immediate precautions and referral compliance. • Attitude and behaviour: demonstrate a strong patient-safety orientation, responsibility and urgency, honest communication, and awareness of personal limitations. • Experience: participation in supervised care of patients with acute neurological complaints; case discussions involving referral and imaging decisions in neurological emergencies.
Assessment information sources	• Case-based discussion • Direct observation of handover or referral communication • Mini-CEX • Supervisor feedback • OSCE or structured viva
Entrustment / supervision level	Level 3 (indirect supervision): the learner may recognize urgency, recommend neuroimaging / referral, and provide initial counseling, with supervisor confirmation, by the end of the rotation.
Expiration date	One year without practice after summative entrustment decision.

Theme 5

EPA 1. Focused stroke history with identification of red-flag features

1. Title of the EPA 2. Specification and limitations	Obtain a focused history in a patient presenting with sudden hemiplegia, speech difficulty, and behavioral change and identify red-flag features suggestive of acute stroke. This EPA includes no more and no less than 1. Eliciting the presenting complaints in a structured manner, including exact time of onset or last-known-well time, progression of weakness, speech difficulty, and behavioral change. 2. Asking focused questions regarding facial deviation, arm or leg weakness, sensory loss, aphasia, dysarthria, altered consciousness, seizures, visual symptoms, and swallowing difficulty. 3. Identifying red-flag features suggestive of acute stroke such as sudden onset focal deficit, severe headache, vomiting, collapse, reduced consciousness, seizures, or rapidly worsening symptoms. 4. Exploring vascular risk factors and relevant background history including hypertension, diabetes, cardiac disease, smoking, previous stroke/TIA, anticoagulant use, and trauma. 5. Summarizing the history and promptly communicating concern for acute cerebrovascular event.
---	--

	Context: emergency room, ward, or supervised outpatient setting. Targeted transition point: first fulltime clinical clerkship to next clerkship. Limitations: does not include independent final diagnosis, thrombolysis decisions, or interpretation of advanced neuroimaging.
3. Most relevant domains of competence	X Medical Expert X Health Advocate X Communicator ☐ Scholar X Collaborator X Professional ☐ Manager
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge • Clinical presentation and time-sensitive nature of acute ischemic and hemorrhagic stroke. • Common stroke risk factors, relevant vascular anatomy, and importance of last-known-well time. • Red-flag features requiring immediate escalation and neuroimaging. Skill • Take a focused neurological history in a time-efficient and structured manner. • Recognize stroke warning signs and distinguish them from less urgent complaints. • Present the case clearly and communicate urgency to the team. Attitude and behaviour • Maintains calm, empathetic, and respectful communication with patient and attendants. • Prioritizes patient safety and urgency without causing avoidable panic. • Seeks senior help promptly when stroke is suspected. Experience • Focused neurological histories obtained in at least 3-5 patients with acute neurological complaints. • Observed discussion of stroke red flags and emergency escalation with a supervisor.
5. Assessment information sources to assess progress and ground a summative entrustment decision	Observation: satisfactory observation of focused neurological history taking at least twice by experienced health care professionals. Case-based discussions: one CBD on suspected acute stroke. Indirect supervision (level 3) ultimately before transition to the next clerkship.
6. Entrustment for which level of supervision is to be reached at which stage of training?	Indirect supervision (level 3) by the end of the clerkship: the learner may obtain a focused stroke history, identify red-flag features, and report urgency, with supervisor review.
7. Expiration date	One year without practice after summative entrustment decision.

EPA 2. Structured neurological examination in suspected acute stroke

1. Title of the EPA 2. Specification and limitations	Perform a structured neurological examination including motor system, cranial nerves, speech assessment, and localization of the lesion. This EPA includes no more and no less than 1. Assessing level of consciousness and general neurological status. 2. Performing a focused motor examination including tone, power, reflexes, pronator drift, and comparison of both sides. 3. Examining relevant cranial nerves, especially facial asymmetry, gaze deviation, visual field deficit, and bulbar involvement where indicated. 4. Assessing speech and language for aphasia, dysarthria, comprehension, naming, and repetition as feasible. 5. Conducting basic sensory screening and identifying laterality to help localize the lesion. 6. Recognizing signs suggestive of hemispheric, brainstem, or dominant hemisphere involvement and communicating findings promptly. Context: emergency room, ward, skills lab, or supervised bedside setting. Targeted transition point: first fulltime clinical clerkship to next clerkship. Limitations: does not include highly specialized examination beyond undergraduate level or independent definitive lesion mapping.
3. Most relevant domains of competence	X Medical Expert ☐ Health Advocate X Communicator ☐ Scholar X Collaborator X Professional ☐ Manager
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge • Basic neuroanatomy relevant to corticospinal tracts, cranial nerves, language dominance, and hemispheric localization. • Key examination findings in acute stroke, including UMN facial weakness, hemiplegia, aphasia, neglect, and gaze abnormalities. • Principles of bedside lesion localization. Skill • Perform a focused and structured neurological examination safely and efficiently. • Assess speech, cranial nerves, and motor deficits in a systematic order. • Identify major abnormal findings and localize the lesion at a basic undergraduate level. Attitude and behaviour • Demonstrates patient dignity, safety, and professionalism throughout examination. • Uses a systematic and disciplined approach under time pressure. • Recognizes own limits and escalates when the patient is unstable. Experience • Structured neurological examination performed under supervision in at least 3-5 patients or simulations with focal deficits. • Supervisor-observed performance of motor, cranial nerve, and speech assessment.

5. Assessment information sources to assess progress and ground a summative entrustment decision	Observation: satisfactory observation of focused neurological examination at least twice by experienced health care professionals. Case-based discussions: one CBD on lesion localization in stroke. Indirect supervision (level 3) ultimately before transition to the next clerkship.
6. Entrustment for which level of supervision is to be reached at which stage of training?	Indirect supervision (level 3) by the end of the clerkship: the learner may perform a focused neurological examination, identify major deficits, and communicate basic localization, with supervisor review.
7. Expiration date	One year without practice after summative entrustment decision.

EPA 3. Urgent imaging, referral, and attendant counseling in suspected acute stroke

1. Title of the EPA 2. Specification and limitations	Recognize the urgency of stroke management, interpret the need for immediate neuroimaging and referral, and counsel the attendants appropriately. This EPA includes no more and no less than 1. Integrating relevant history and examination findings suggestive of acute stroke. 2. Recognizing the need for immediate non-contrast CT brain and other urgent neuroimaging as guided by local protocol and senior advice. 3. Promptly informing the senior clinician/emergency team and arranging urgent referral according to institutional stroke pathway. 4. Recognizing general initial priorities such as airway protection, aspiration risk, blood glucose check, and time-sensitive management without independently initiating specialist therapy beyond role limits. 5. Counseling attendants regarding urgency, need for immediate imaging/referral, avoidance of oral intake if unsafe, and importance of not delaying treatment. Context: emergency room, ward, or acute care setting. Targeted transition point: first fulltime clinical clerkship to next clerkship. Limitations: does not include independent thrombolysis/mechanical thrombectomy decision-making or definitive specialist management.
3. Most relevant domains of competence	X Medical Expert X Health Advocate X Communicator ☐ Scholar X Collaborator X Professional ☐ Manager
4. Required experience, knowledge, skills, attitude and behaviour	Knowledge • Time-critical principles of stroke care and reasons for immediate neuroimaging. • Indications for urgent referral under stroke protocols and common contraindication-related concerns that require senior review. • Key messages for attendant counseling in neurological emergencies. Skill • Recognize urgency from available clinical information and trigger timely escalation.

	• Communicate clearly with seniors, emergency staff, and attendants. • Provide concise counseling on immediate precautions and the need for prompt imaging and referral. Attitude and behaviour • Displays strong patient-safety orientation and urgency. • Communicates honestly, clearly, and professionally during emergencies. • Accepts limitations and involves seniors without delay. Experience • Participation in supervised care or case discussion of at least 2-3 patients with suspected stroke or comparable neurological emergency. • Observed handover/referral communication in an acute setting.
5. Assessment information sources to assess progress and ground a summative entrustment decision	Observation: satisfactory observation of handover/referral communication and attendant counseling at least twice by experienced health care professionals. Case-based discussions: one CBD on acute stroke pathway and urgency of imaging. Indirect supervision (level 3) ultimately before transition to the next clerkship.
6. Entrustment for which level of supervision is to be reached at which stage of training?	Indirect supervision (level 3) by the end of the clerkship: the learner may recognize urgency, recommend immediate imaging/referral, and counsel attendants appropriately, with supervisor confirmation.
7. Expiration date	One year without practice after summative entrustment decision.