



# THIRD YEAR MBBS

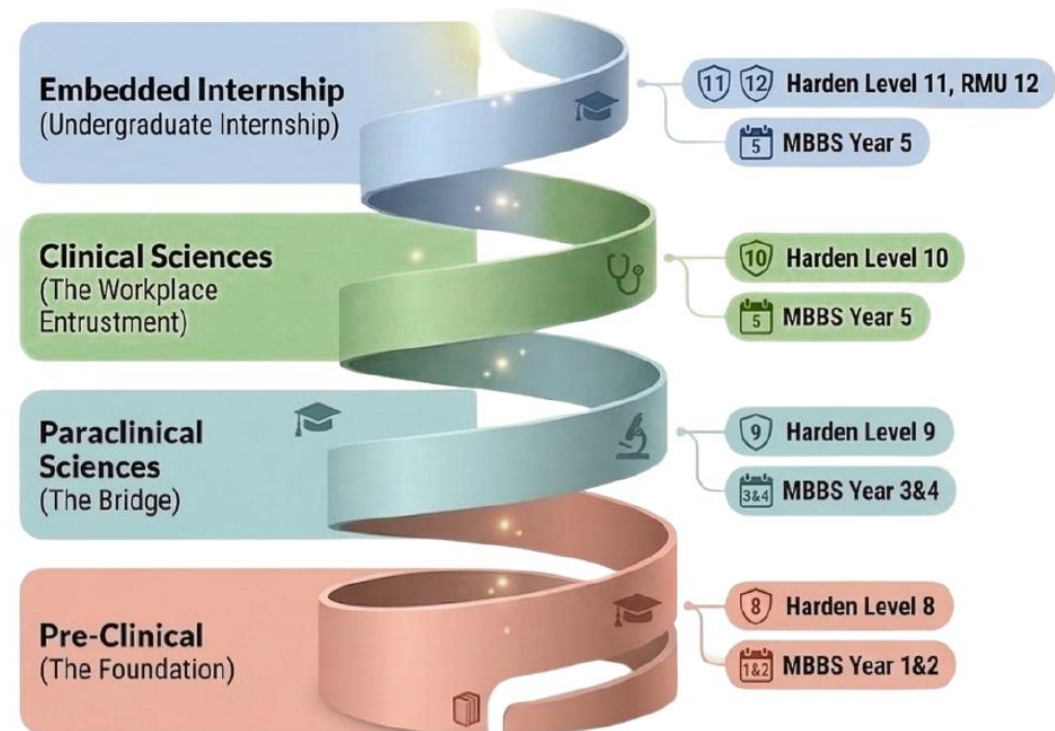
## RMU-12

### Integrated Modular Curriculum-2026

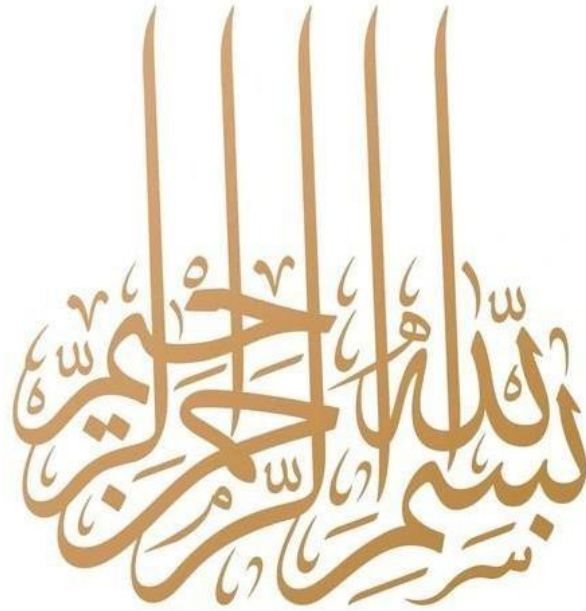
Isolation to Beyond Boundaries



[www.rmur.edu.pk](http://www.rmur.edu.pk)



Department of Medical Education



**Dedicated to Hazrat Muhammad (S.A.W)**



## **RMU-12**

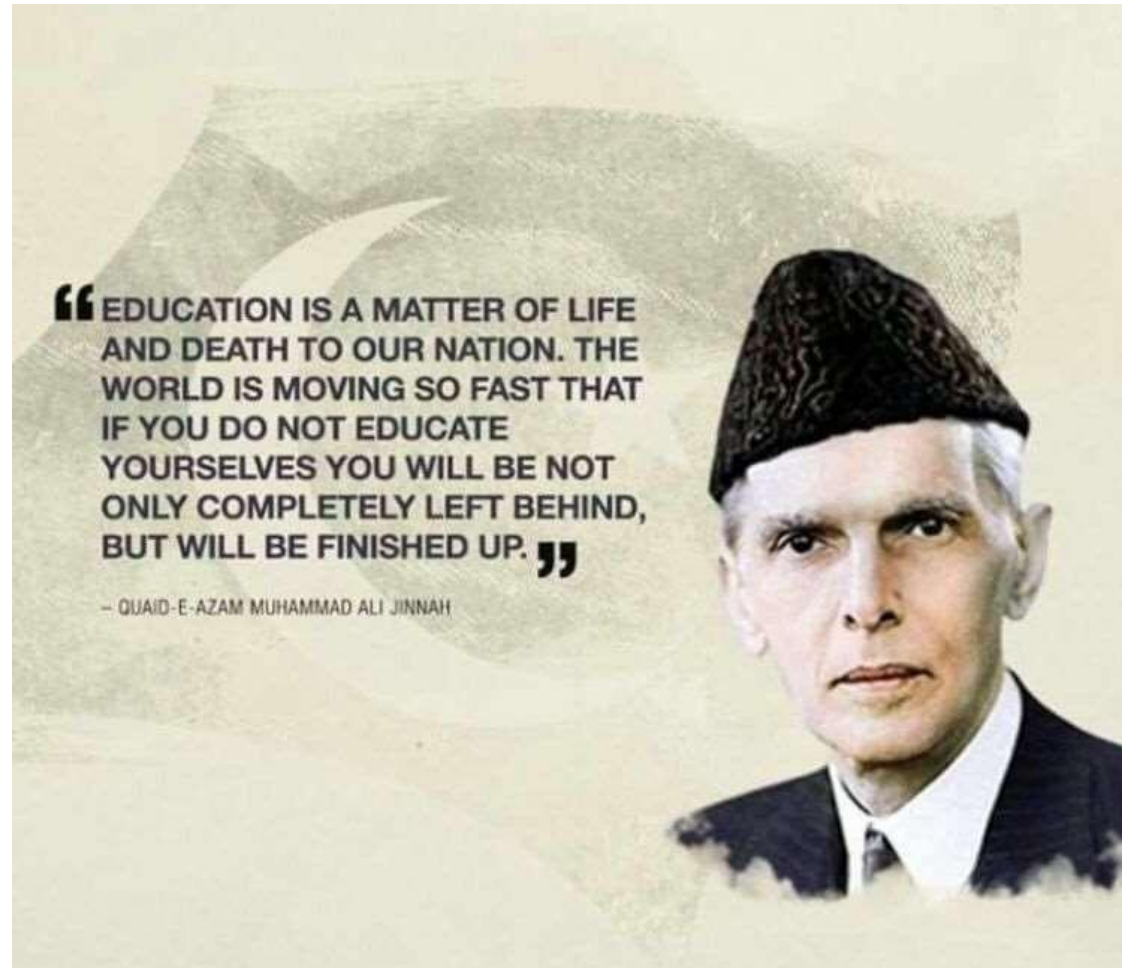
### **Integrated Modular MBBS Curriculum -2026**

#### **Isolation to Beyond Boundaries**

#### **3<sup>rd</sup> Year MBBS**

*Revised January 2026*

## **Quote by Quaid-e-Azam Muhammad Ali Jinnah**





**Prof. Dr. Muhammad Umar**  
Vice Chancellor RMU



**Dr. Muhammad Khurram**  
Principal RMU

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

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

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



**Prof, Dr. Ifra Saeed**  
Professor of Anatomy  
Director DME &  
Dean Basic Sciences

The preparation and implementation of modular curriculum provides the faculty an opportunity to design and re orientate and re-conceptualize health –illness process. Transforming academic stakeholders’ learning perspectives and then to translate it in students’ development as an effective force of society, well versed with modern day problems, is an uphill task. This is a humble effort in this regard. Still there is lot to distill, crystallize and narrate. Hopefully from this marathon, the curiosity will emerge like a fresh breeze, from here the character will arise in the horizon, as all this at the end is meant to serve the ailing humanity and to accomplish the dream of a healthy society.

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

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

## Authors

Prof. Muhammad Umar  
Vice Chancellor  
Rawalpindi Medical University & Allied  
Hospitals



Prof. Dr. Ifra Saeed  
Professor of Anatomy  
Director DME  
Rawalpindi Medical University



Dr. Zunera Hakim  
Chairperson of Pharmacology  
Implementation Incharge 3<sup>rd</sup> Year MBBS  
Rawalpindi Medical University



Dr. Saima Ambreen  
Professor of Medicine  
Rawalpindi Medical University



Dr. Gohar Rasheed  
Assoc. Professor of Surgery  
Rawalpindi Medical University



## Co- Authors

Dr. Fatima Tuz Zahra  
Chairperson of Pathology  
Rawalpindi Medical University



Dr. Filza Ali  
Chairperson of Forensic Medicine  
Rawalpindi Medical University

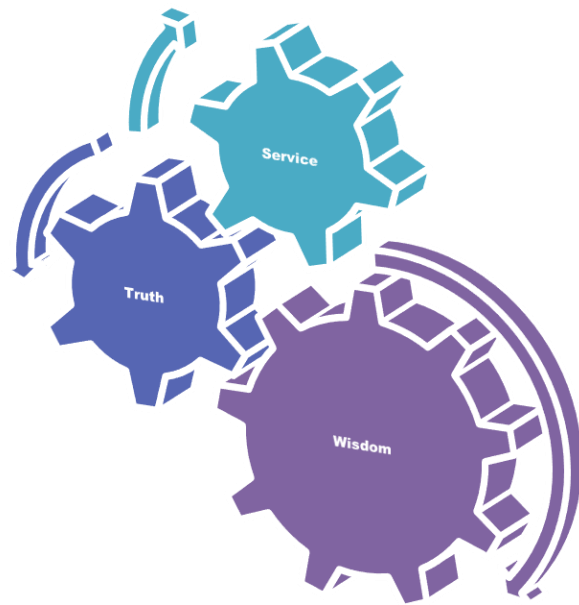


Dr Tanveer Hussain  
Chairperson of Gastroenterology  
Focal Person of Medicine Allied Specialities  
Rawalpindi Medical University



## 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

# RMU ISO CERTIFICATION



The management system of  
**Rawalpindi Medical University**  
Tipu Road, Chamanzar Colony, Rawalpindi, Pakistan.

has been assessed and certified as meeting with the requirements of :

**ISO 9001:2015**

**Under the Scope:**  
"Providing Education Services for Medical Graduation & Post Graduation."

**Certificate Number :** PK230048  
**Issue date :** 10-10-2023.  
**Valid till :** 09-10-2024.



**Authorized Signature**  
RICI Company Ltd.  
[www.riconline.com](http://www.riconline.com)

\*This certificate remains valid subject to successful surveillance audits and maintenance of management system as per certification rules and procedures of RICI Company Ltd.  
\*Further clarification regarding scope of this certificate and applicability of ISO 9001:2015 requirements may be obtained from the organization.  
\*This certificate remains property of RICI Company Ltd., to whom it must be returned upon request.



Page 1 of 1

7067, Salman Al Farsi 3002, Al Khaldiyyah Al Jarubiyah Dist., Dammam, Kingdom of Saudi Arabia  
Email: [sbamea@riconline.com](mailto:sbamea@riconline.com)



Scan to verify

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

**Procedure For Control of Documented Information**

*Document #: RMU-MR-SOP-59 Rev. #: 00 Issue #: 01 Issue Date: 25-01-2026*  
*In-Compliance with ISO 9001:2015 Clause 7.5*

**Author(s) / Prepared by**  
Director Medical Education,  
Asst. Director Medical Education,

**Creation Date**  
10-12-2025

**Reviewer(s)**  
Curriculum Committee

**Effective Date**  
16-02-2026

**Approver(s)**  
Vice Chancellor


**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**.

**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 Management/personnel and only for Company-related activities. Disclosure of any information contained within this procedure to any person outside the employee of the institute without written permission of the Vice Chancellor or Principal or ISO Committee Head is strictly prohibited.


	<b>Rawalpindi Medical University</b>			
	<b>Doc. Title: Procedure For Control of Documented Information</b>			
	<b>Document #:</b> RMU-MR-SOP-59	<b>Rev. #:</b> 00	<b>Issue #:</b> 01	<b>Issue Date:</b> 25-01-2026

<b>DOCUMENT INFORMATION</b>	
<b>Category</b>	<b>RMU-12 Integrated Modular MBBS Curriculum-2026</b>
Document	Procedure for Control of Documented Information
Issue	1
Rev	00
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	22-01-2026
Effective Date	-01-2026
Control Status	<b>Controlled</b>
Distribution	VC, Principal, ISO Committee
Disclaimer	This document contains confidential information. Do not distribute this document without prior approval from higher management of <b>Rawalpindi Medical University</b> .

	<b>Rawalpindi Medical University</b>			
	<b>Doc. Title: Procedure For Control of Documented Information</b>			
	<b>Document #:</b> RMU-MR-SOP-59	<b>Rev. #:</b> 00	<b>Issue #:</b> 01	<b>Issue Date:</b> -01-2026


<b>Document Approval</b>
--------------------------

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

	<b>Rawalpindi Medical University</b>			
	<b>Doc. Title: Procedure For Control of Documented Information</b>			
	<b>Document #:</b> RMU-MR-SOP-59	<b>Rev. #:</b> 00	<b>Issue #:</b> 01	<b>Issue Date:</b> -01-2026

### Document Revision History

Author(s)	Date	Version	Description
Dr Naeem Akhtar, Dr Asma Khan, Dr Sajid Hameed, Dr Zunera Hakim	2021-2022	1 <sup>st</sup>	Developed for Third Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum incorporated
Dr Mobina Ahsan, Dr Asma Khan, Dr Romana Arif, Dr Zunera Hakim	2022-2023	2 <sup>nd</sup>	Developed for Third MBBS. Horizontally and vertically integrated Learning objectives updated, Research, Bioethics, Family Medicine curriculum incorporated along with Professionalism
Dr Mobina Ahsan, Dr Asma Khan, Dr Romana Arif, Dr Zunera Hakim	2023-2024	3 <sup>rd</sup>	Developed for Third Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum revamped Bioethics, Family Medicine curriculum incorporated along with Professionalism. Compulsory manuscript writing incorporated
Dr Mobina Ahsan, Dr Attiya Munir, Dr Filza Moin, Dr Zunera Hakim	2025-2026	4 <sup>th</sup>	Developed for Third Year MBBS. Horizontally and vertically integrated Learning objectives updated, Coding and Calgary gauge added Research curriculum revamped Bioethics, Family Medicine curriculum incorporated along with Professionalism. Compulsory manuscript writing incorporated Entrepreneurship, Leadership, ITC, Artificial Intelligence, Video Graphy, Expository Writing, Social in Medicine curriculum incorporated
Dr Zari Salahuddin, Dr Zunera Hakim, Dr Fatima Tuz Zahra, Dr Filza	2026-2027	5 <sup>th</sup>	Developed for Third Year MBBS. Horizontally and vertically integrated Theme based Multidisciplinary approach in weekly schedules based on Harden's Level 9-10 of Integration. Upgradation of learning objectives towards better integration. Inclusion of joint multidisciplinary sessions from all concerned specialties on weekly basis.

	<b>Rawalpindi Medical University</b>			
	<b>Doc. Title: Procedure For Control of Documented Information</b>			
	<b>Document #:</b> RMU-MR-SOP-59	<b>Rev. #:</b> 00	<b>Issue #:</b> 01	<b>Issue Date:</b> -01-2026

<b>Document Code</b>	<b>Issue # /Rev.#</b>	<b>Copy #</b>	<b>Copy Holders</b>	<b>Distribution Mode</b>	<b>Signature</b>
<b>RMU-MR-SOP-59</b>	<b>01/00</b>	<b>01</b>	<b>V.C</b>	<b>Email</b>	
<b>RMU-MR-SOP-59</b>	<b>01/00</b>	<b>02</b>	<b>HODs</b>	<b>Email</b>	
<b>RMU-MR-SOP-59</b>	<b>01/00</b>	<b>03</b>	<b>IC</b>	<b>Hard Copy</b>	

## Table of Contents

<b>SECTION-I: Contributors and Developing Team.....</b>	
Members of Syndicate.....	
Dean of Faculties and Professors.....	
Contributors.....	
<b>SECTION – II: RMU – 12 Integrated Modular MBBS Curriculum 2026 Isolation to Beyond Boundaries.....</b>	
University Moto, Vision, Values & Goals .....	
RMU – 12 Structured Framework of Integrated Modular MBBS Curriculum 2026.....	
RMU – 12 Assessment Framework of Integrated Modular MBBS Curriculum 2026 Isolation to Beyond Boundaries .....	
Clinico-Connect (Transdisciplinary Clinical Reasoning Forum TCRF) .....	
Example of Clinico-Connect (Transdisciplinary Clinical Reasoning Forum-TCRF) .....	
Guidelines of Clinico-Connect (Transdisciplinary Clinical Reasoning Forum-TCRF).....	
<b>SECTION-III: Structured Framework of RMU-12 Integrated Modular MBBS Curriculum.....</b>	
First Year to Final Year Framework of RMU-12.....	
Academic Calendar of 3 <sup>rd</sup> Year MBBS, 2026-27.....	
<b>SECTION-IV: Teaching and Learning Strategies/Methodologies.....</b>	
Large Group Interactive Session (LGIS) .....	
Small Group Discussion (SGD) .....	
Self-Directed Learning (SDL) .....	
Case Based Learning (CBL) .....	
Practical Sessions/Skill Lab (SKL) .....	
<b>SECTION -V: Course Content.....</b>	

**Block VII: Foundation Module II & III**.....

Module XIII (Foundation Module II) .....

Module XIV (Foundation Module III) .....

**Block VIII: GIT, Hepatobiliary & Parasitology + Microbes & Antimicrobials**.....

Module XV GIT, Hepatobiliary & Parasitology Module.....

Module XVI Microbes & Antimicrobials Module.....

**Block IX: (Hematology & Immunology + CVS & Respiration Module)** .....

Module XVII Hematology & Immunology Module.....

Module XVIII CVS & Respiration Module.....

**SECTION -VI: Clinical Clerkship**.....

**SECTION-VII: Learning Resources**.....

**SECTION – VIII: Assessment**.....

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

Assessment Policy.....

**SECTION -IX: Feedback and Evaluation** .....

**SECTION- X: RMU Spirally Integrated ALPHA/GEC Cluster**.....

## **SECTION-I**

### **Contributors & Developing Team**

### Members of Syndicate

Sr. No	Members
1.	The Minister for SHC & ME Department, Punjab / Pro Chancellor, Rawalpindi Medical University, Rawalpindi.
2.	The Secretary to Government of the Punjab, SHC & ME Department, Lahore
3.	The Secretary to Government of the Punjab, Finance Department, Lahore
4.	The Secretary to Government of the Punjab, Higher Education Department, Lahore
5.	The Secretary to Government of the Punjab, Law & Parliamentary Affairs Department, Lahore
6.	The Chairman Higher Education Commission, Sector H-9, Islamabad
7.	Prof. Fareed Minhas, Ex, Professor of Psychiatry, RMC, Rawalpindi.
8.	Prof. Syed Irfan Ahmed, Ex-Professor of Medicine, RMC, Rawalpindi
9.	Syed Bakhtiyar Kazmi, Partner KPMG Taseer Hadi & Co
10.	Dr. Muhammad Saqib Abbasi, Rawalian Alumini
11.	The Medical Superintendent, Holy Family Hospital, Rawalpindi
12.	The Principal, College of Nursing Holy Family Hospital, Rawalpindi
13.	The Vice Chancellor Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi
14.	The Vice Chancellor National University of Science & Technology (NUST), Islamabad

### Deans of Faculties & Professors

Sr. No	Name	Department	Sr. No	Name	Department	Sr. No	Name	Department
1.	Prof. Dr. Muhammad Umar	Vice Chancellor	19.	Prof. Dr. Asad Tameez-ud-Din	Psychiatry	37.	Dr. Hasnain Khan	Plastic Surgery
2.	Prof. Dr. Muhammad Khurram	Principal	20.	Prof. Dr. Zein El Aamir	Urology	38.	Dr. Obaid ur Rehman	Orthopedics
3.	Prof. Dr. Muhammad Khurram	Medicine	21.	Prof. Dr. Wafa Omer	Pathology	39.	Dr. Muhammad Mujeeb Khan	Infection Disease
4.	Prof. Akram Randhawa	Pharmacology	22.	Dr. Jawad Zaheer	Anesthesia	40.	Dr. Aneela Jamil	Biochemistry
5.	Prof. Rai Muhammad Ashgar	Peads	23.	Dr. Ashraf Mehmood	Neurosurgery	41.	Dr. Muhammad Asad	Cardiology
6.	Prof. Shagufta Saeed	Gynae/Obs	24.	Dr. Ahmed Hassan	ENT	42.	Dr. Shawana Sharif	Dermatology
7.	Prof. Riaz Ahmed Sheikh	Orthopedic Surgery	25.	Dr. Sadia Chaudhry	ENT	43.	Dr. Faran Maqbool	, Medicine
8.	Dr. Fatima tuz Zahra	Pathology	26.	Dr. Muhammad Shahzad Manzoor	, Medicine	44.	Dr. Abeera Zareen	Anesthesia
9.	Prof. Dr. Naeem Akhtar	Pathology	27.	Dr. Faryal Azhar	Surgery	45.	Dr. Hina Sattar	Peads
10.	Prof. Dr. Samia Sarwar	Physiology	28.	Dr. Usman Qureshi	Surgery	46.	Dr. Raja Asif Masood	Nephrology
11.	Prof. Dr. Nousheen Qureshi	ENT	29.	Dr. Saima Ambreen	Medicine	47.	Dr. Sadia Azam Khan	Family Medicine
12.	Prof. Dr. Naveed Akhtar Malik	Surgery	30.	Dr. Sadia Khan	Gynae	48.	Dr. Rehman Rasool	, Orthopedics
13.	Prof. Dr. Waqas Raza	Surgery	31.	Dr. Rubaba Abid	Gynae	49.	Dr. Saad Riaz	Orthopedics
14.	Prof. Dr. Tallat Farkhanda	Gynae /Obs	32.	Dr. Humera Noreen	Gynae	50.	Dr. Israr Liaquat	Peads
15.	Prof. Dr. Nasir Khan	Radiology	33.	Dr. Tanveer Husain	Gastroenterology	51.	Dr. Arshad Rabbani	Medicine
16.	Prof. Dr. Ayesha Yousaf	Anatomy	34.	Dr. Hasnain Khan	Plastic Surgery	52.	Dr. Hasnain Khan	Plastic Surgery
17.	Prof. Dr. Ifra Saeed	Anatomy/DME	35.	Dr. Mudassar Faiz Gondal	Peads Surgery	53.	Dr. Obaid ur Rehman	Orthopedics
18.	Prof. Dr. Fuad Ahmad Khan Niazi	, Ophthalmology	36.	Dr. Zunera Hakim	Pharmacology	54.	Dr. Muhammad Mujeeb Khan	Infection Disease

## Contributors

Department of Medicine	Department of Surgery	Department of Plastic Surgery
Prof. Muhammad Umar Vice Chancellor	Professor. Dr. M. Waqas Raza	Assistant Prof. Dr. Husnain Khan
Professor. Dr. Muhammad Khurram	Professor. Dr. Anis Ahmed	Department of Gastroenterology
Associate Prof. Dr. Shahzad Manzoor	Associate. Prof. Dr Usman Qureshi	Associate. Prof. Dr. Tanveer Hussain
Associate Prof. Dr. Saima Ambreen	Associate Prof. Dr. Gohar Rasheed	Assistant. Prof. Sadia Ahmed
Associate Prof. Dr. Muhammad Arif	Associate Prof. Dr. Faryal Azhar	Department of Cardiology
Associate. Prof. Dr. Lubna Meraj	Associate Prof. Dr M. Zafar Iqbal	Assistant. Prof. Dr. Muhammad Asad
Assistant Dr. Mujeeb Khan	Assistant. Prof. Dr. Muhammad Atif	Department of Obs/Gynae
Assistant. Prof. Dr. Faran Maqbool	Assistant. Prof. Dr Huma Sabir Khan	Professor. Dr. Tallat Farkhanda
Assistant Prof. Nida Anjum	Assistant Prof. Dr. Syed Rahat Hassan	Associate. Prof. Dr Sadia Khan
Department of ENT	Assistant Prof. Dr. Asifa Dian	Associate. Prof. Dr. Humera Noreen
Professor. Dr. Nousheen Qureshi	Department of Pediatrics Surgery	Associate. Prof. Dr. Rubaba Abid Naqvi
Associate Prof. Dr. Ahmad Hassan Ashfaq	Associate Prof. Dr. Mudasser Faiz Gondal	Associate Prof. Dr Sobia Nawaz
Associate Prof. Dr. Sadia Chaudhry	Assistant Prof. Dr. Mahwish Khan	Assistant. Prof. Dr. Humaira Bilqis
Assistant. Prof. Dr. Haitham Akaash	Department of Pediatrics	Assistant. Prof. Dr. Saima Bibi
Assistant. Prof. Dr. Muhammad Arshad	Assistant Prof. Dr. Hina Sattar	Assistant. Prof. Dr Maliha Sadaf
Assistant Prof. Dr. Ashar Alamgir	Assistant Prof. Dr. Aqeela Ayub	Assistant. Prof. Dr Khansa Iqbal
Assistant Prof. Dr. Tabassum Aziz	Assistant Prof. Dr. Jawaria Zain	Assistant Prof. Dr. Amara Arooj
Assistant Prof. Dr. Nida Riaz	Assistant Prof. Dr. Asad Shabbir	Assistant. Prof. Dr. Shama Bashir
Department of Psychiatry	Assistant Prof. Dr. Israr Liaqat	Assistant Prof. Dr. Aqsa Ikram
Prof. Dr. Asad Tamis ud Din	Department of Urology	Assistant. Prof. Dr. Nighat Naheed
Associate Prof. Dr. Muhammad Kashif	Associate Prof. Dr. Zain-ul-Aamir	Assistant. Prof. Dr. Farah Deeba
Assistant Prof. Dr. Mahmood Ali Khan Jafri		Dr. Ismat Batool S.R BBH

Assistant Prof. Dr. Sadia Majid	Associate Prof. Dr. Zeeshan Qadeer	<b>Department of Orthopedics</b>
Assistant Prof. Dr. Qurat ul Ain	<b>Department of Dermatology</b>	Associate Prof. Dr. Obaid-Ur-Rahman
Assistant Prof. Dr. Azeem Khan	Assistant Prof. Dr. Shawana Sharif	Assistant Prof. Dr. Rehman Rasool Akhtar
<b>Department of Neurosurgery</b>	<b>Department of Pathology</b>	Assistant Prof. Dr. Saad Riaz
Associate Prof. Dr. Ashraf Mahmood	Professor. Dr. Naeem Akhtar	Assistant Prof. Dr. Muhammad Hassan
Assistant Prof. Dr. Soban Sarwar Gondal	Assistant Prof. KAiran Fatima	<b>Department of Anesthesiology</b>
<b>Department of Radiology</b>	Assistant Prof Fatima Tuz Zahra	Associate Prof. Dr. Jawad Zahir
Professor Dr. Nasir Khan	Assistant Prof. Dr. Rabbia Khalid Latif	Assistant Prof. Dr. Abeera Zareen
Associate Prof. Dr. Hina Hanif Mughal	Dr. Abid Hassan APMO	Assistant. Prof. Dr. Waqas Anjum
Assistant Prof. Dr. Anum Zahoor	Dr. Uzma Zaffar APWMO	Assistant Prof. Dr. Anum Malik
Assistant Prof. Dr. Faisal Mehmood	Dr. Jaweriya Qaiser APWMO	Assistant Prof. Dr. Ayesha Mansoor
Assistant Prof. Dr. Hina Hafeez Abbasi	Dr. Faiza Zafar S.W.D	<b>Department of Pharmacology</b>
Assistant Prof. Dr. Beenish Nadeem	Dr. Syed Iqbal Haider S.D	Prof. Dr. Akram Randhawa
Assistant Prof. Dr. Riffat Raja	Dr. Mehreen Fatima DEMO	Associate Prof. Dr. Zunera Hakim
Dr. Aniq Saleem S.R, HFH	Dr. Sara Rafi DEMO	Assistant Prof. Dr. Attiya Munir
Dr. Saba Binte Kashmir S.R HFH	Dr Syeda Aisha DEMO	Assistant Prof. Dr. Haseeba Talat
Dr. Jehangir Khan	Dr. Muhammad Shabih Haider Demo	Assistant Prof. Dr. Zari Salahuddin Abbasi
Dr.Sana Yaqoob S.R	Dr. Kiran Ahmad S.D	Assistant Prof. Dr. Shanila Akhter
Dr. Nadiha Maryam S.R BBH	Dr. Rabia Anjum	Dr. Arsheen Arshad DEMO
<b>Department of Physiology</b>	Dr. Saroor-e-Syma DEMO	Dr. Afira DEMO
Professor Dr. Samia Sarwar	Dr. Faiza Sahar SWMO	Dr. Zoefashan Fatima Demo
Associate Dr. Faizania Shabbir	Dr. Tahira Jabeen	Dr. Memuna Kanwal Demo
Assistant Prof. Dr. Sidra Hamid	Dr. Mahjabeen	Dr. Aisha Anwar DEMO
Associate Prof. Faizania Shabir	Dr. Laraib Khatoon	Dr. Saba Sarfraz Demo
Dr. Sheena Tariq APMO	Dr. Saira Karim	Dr. Uzma Umar S.D

Dr. Fareed Ullah Khan S.D	<b>Department of Anatomy</b>	<b>Department of Biochemistry</b>
Dr. Kamil Tahir S.D	Professor Dr. Ayesha Yousaf	Assistant Prof. Dr. Aneela Jamil
Dr. Uzma Kiani S.W.D	Professor Dr. Ifra Saeed	Dr. Rahat Afzal APWMO
Dr. Fahad Anwar Demonstrator	Associate Prof. Dr. Mohtasham Hina	Dr. Kashif Rauf S.D
Dr. Jawad Hasan Demo	Assistant Prof. Dr. Arsalan Manzoor Mughal	Dr. Nayab Ramzan S.W.D
Dr. Nazia Mumtaz Demo	Assistant Prof. Dr. Maria Tasleem	Dr. Romessa Naeem DEMO
Dr. Aneela Yasmeen S.D	Assistant Prof. Dr. Summiya Bashir	Dr. Almas Ajaz S.D
Dr. Shazia Nosheen S.D	Assistant Prof. Dr. Tayyaba Qureshi	Dr. Uzma Zafar
Dr. Uzma Kiani DEMO	Assistant Prof. Dr. Sarah Bano	Dr. Rohina Khalid
Dr. Najamul Sehar Javed	Assistant Prof. Dr.	Dr. Sana Latif
<b>Department of Eye.</b>	Dr. Gaiti Ara Saeed APWMO	<b>Department of Nephrology</b>
Prof. Dr. Fauad Ahmad Khan Naizi	Dr. Saadia Baqir APWMO	Assistant Prof. Dr. Sana Kifayat
Assistant Prof. Dr. Ambreen Gul	DR. ALI RAZA, S.D	Assistant Prof. Dr. Noman Butt
Assistant Prof. Dr. Sidra Jabeen	Dr. Muhammad Tariq Furqan S.D	Assistant Prof. Dr. Asmara Asrar
<b>Department of Community Medicine</b>	Dr. Sajjad Hussain S.D	<b>Department of Forensic Medicine</b>
Prof. Dr. Rozina Shahadat Khan	Dr. Kashif Ashraf S.D	Assistant Prof. Dr. Filza Ali
Associate Prof. Dr. Khola Noreen	Dr. Qurat ul Ain Sharif S.W.D	Assistant Prof. Dr. Shahrukh
Associate Prof. Dr. Sana Bilal	Dr. Saira Aijaz S.W.D	Dr. Shahida Bashir APWMO
Assistant Prof. Dr. Rizwana Shahid	Dr. Minahil Haq Demo	DR. Gulzaib Pervaiz APWMO
Assistant Prof. Dr. Afifa Kulsoom	Dr. Urooj Shah DEMO	Dr. Naila Batool APWMO
Assistant Prof Mehwish Riaz	Dr. Zeneera Saqib DEMO	Dr. Urooj Shah DEMO
Assistant Prof. Dr. Farrah Pervaiz		Dr. Roohina Saeed
Dr. Farhan Hassan SD		

Dr. Abdul Qudoos S.D	<b>Department of Medical Education</b>	<b>Department of Critical Care</b>
Dr. Asif Maqbool Butt Demo	Prof. Dr. Ifra Saeed (Director DME)	Associate Prof. Dr. Abrar Akbar
Dr. Imrana Saeed S.D	Asso. Dr. Arsalan Manzoor Mughal (Additional Director of Assessments)	<b>Department of Family Medicine</b>
Dr. Narjis zaidi S,D	Assoc. Prof Dr. Kholah Noreen (Additional Director DME)	Assistant Prof. Dr. Sadia Azam Khan
Dr. Moniba Iqbal PGT	Assoc Prof Dr. Zunera Hakim (Assistant Director DME OTB)	<b>Department of Neurology</b>
Dr. Bushra Farooq PGR	Dr. Farzana Fatima (Assistant Director DME OTB)	Assistant Prof. Dr. Waqas Ahmed
Dr. Zaira Azhar PGR	Dr. Omaima Asif (Assistant Director DME NTB)	<b>Department of Pulmonology</b>
Dr. Saba Maryam PGR	Dr. Maryam S.W.M.O	Assistant Prof. Dr. Zaid Umar
Dr. Ayesha zujaja PGR		<b>Department of Critical Care</b>
Dr. Maria Jabeen PGR		Associate Prof. Dr. Abrar Akbar
Dr. Mehreen Noor PGR		

## **SECTION II**

**RMU-12 Integrated Modular MBBS Curriculum-2026**

## **SECTION-II**

### **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 Entrust able Professional Activities (EPAs), enabling graduates to emerge as practice-ready, safe, and competent medical professionals.

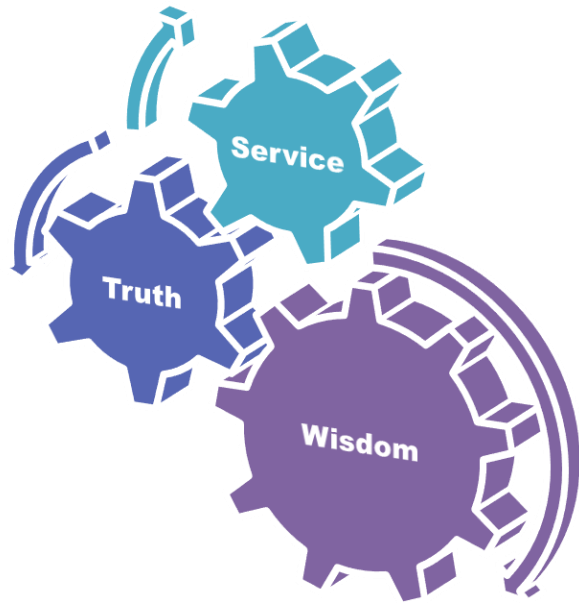
The Clinically Oriented Integrated Modular Curriculum transcends traditional disciplinary silos by promoting horizontal and vertical integration across basic, para-clinical, and clinical sciences. Learning experiences are contextualized around clinical problems and patient-centered care, fostering early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

# Competency Framework

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

COMPETENCY

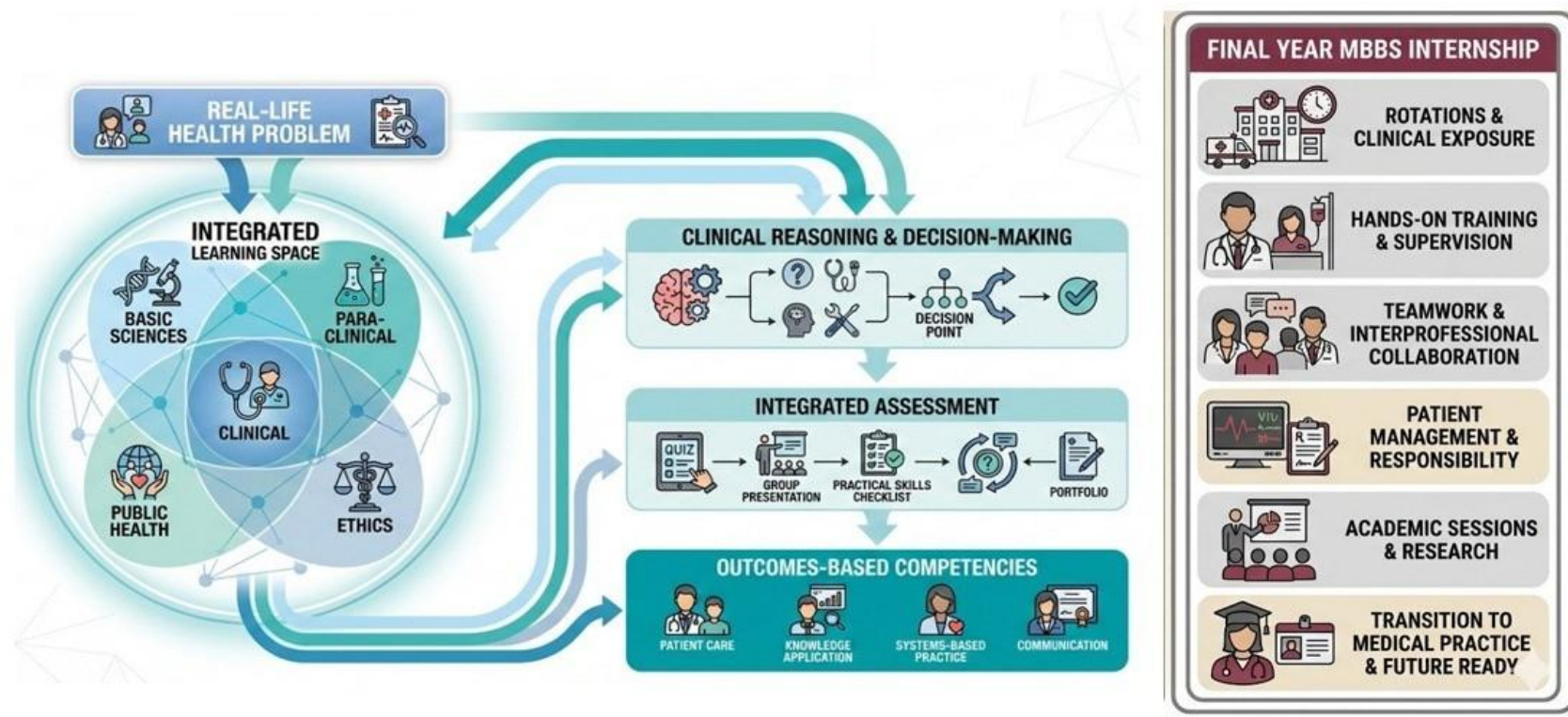


### RMU 12- Isolation to Beyond Boundaries

**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

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



### Foundation

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

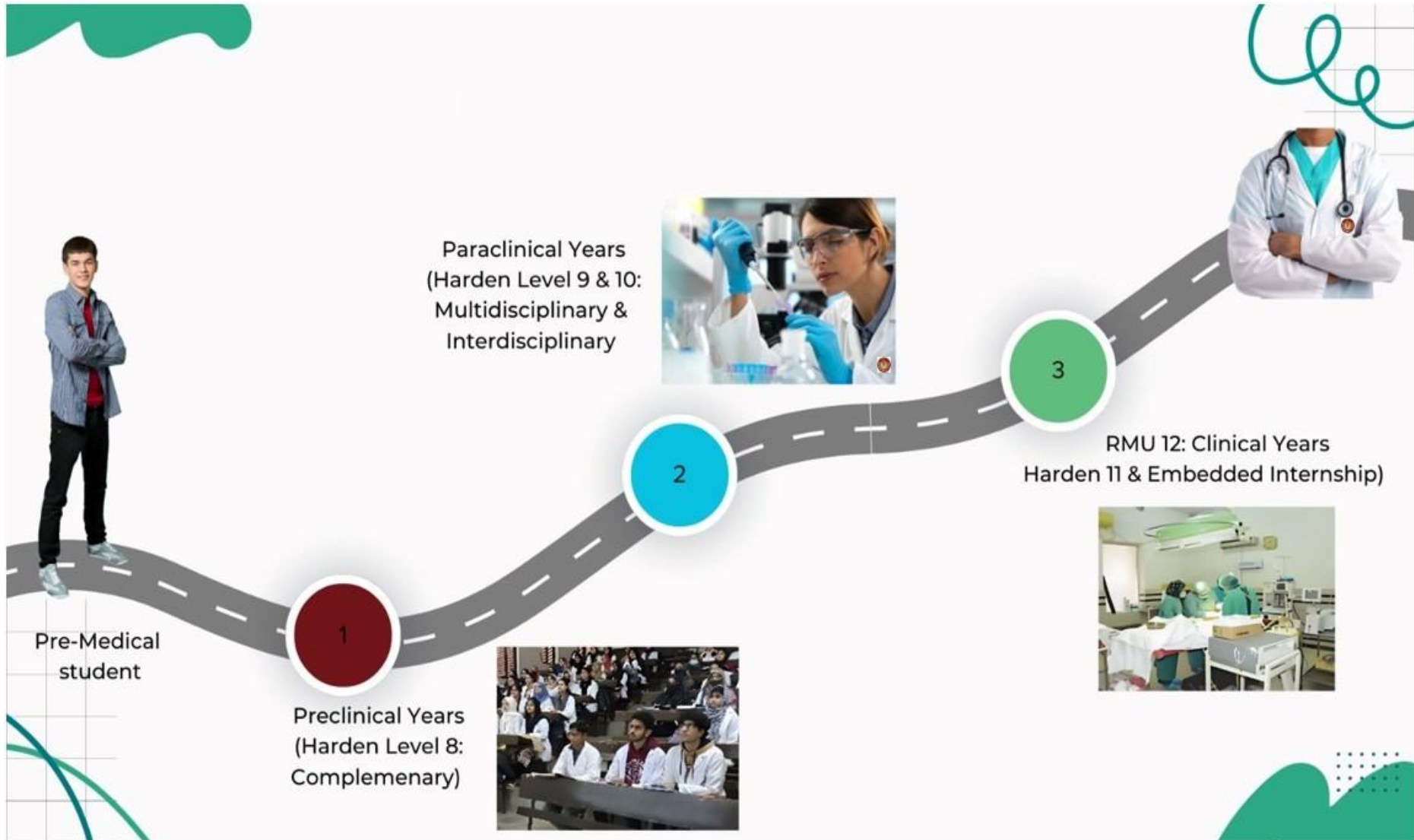
### The Bridge

- Para-clinical sciences
- Harden Level 9,10 (Multi & Interdisciplinary)
- MBBS Year (3<sup>rd</sup> & 4<sup>th</sup>)

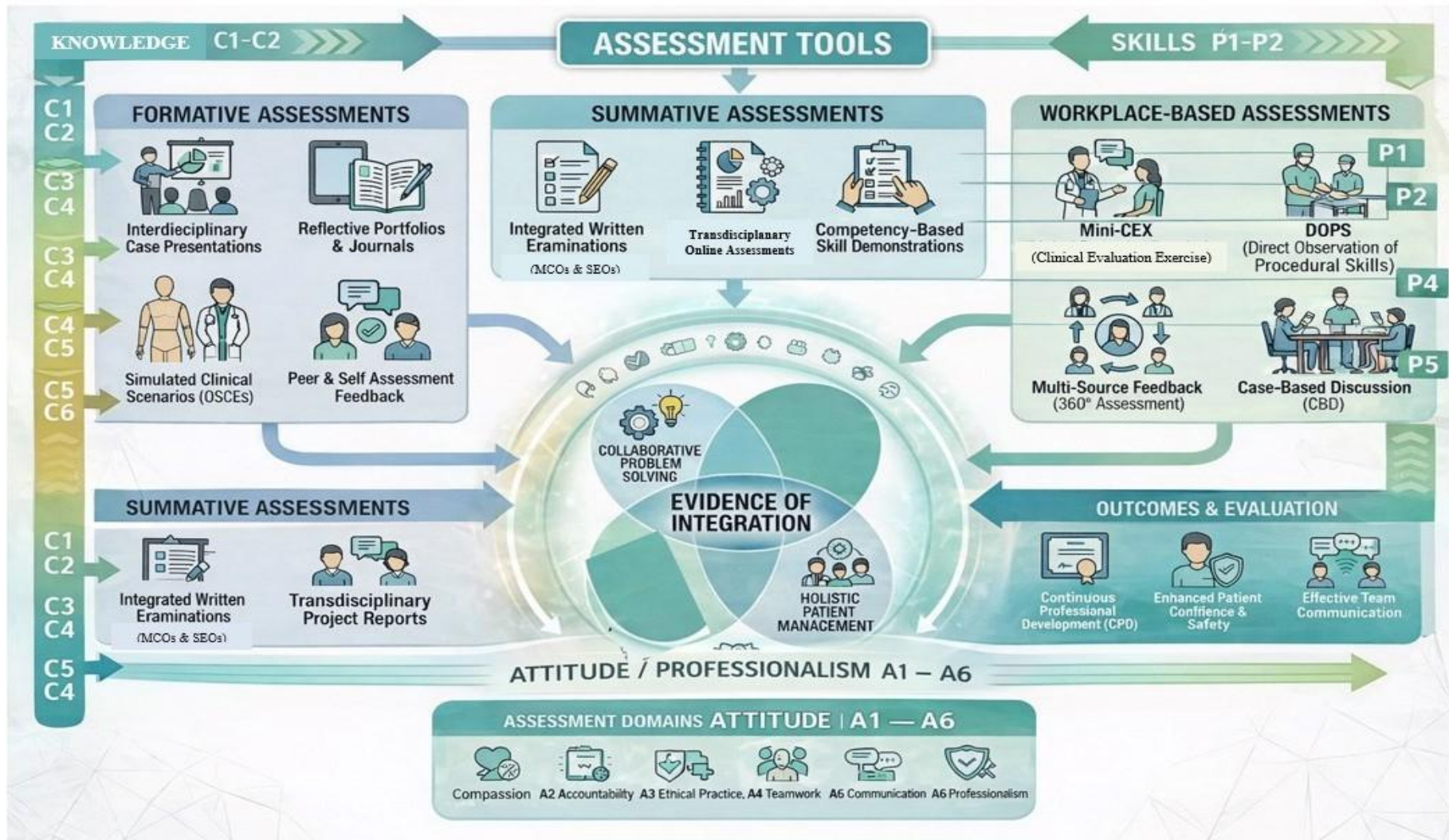
### The Workplace Entrustment Embedded Internship

- Clinical sciences
- Harden Level 11 (Transdisciplinary)
- MBBS Year (5<sup>th</sup>)

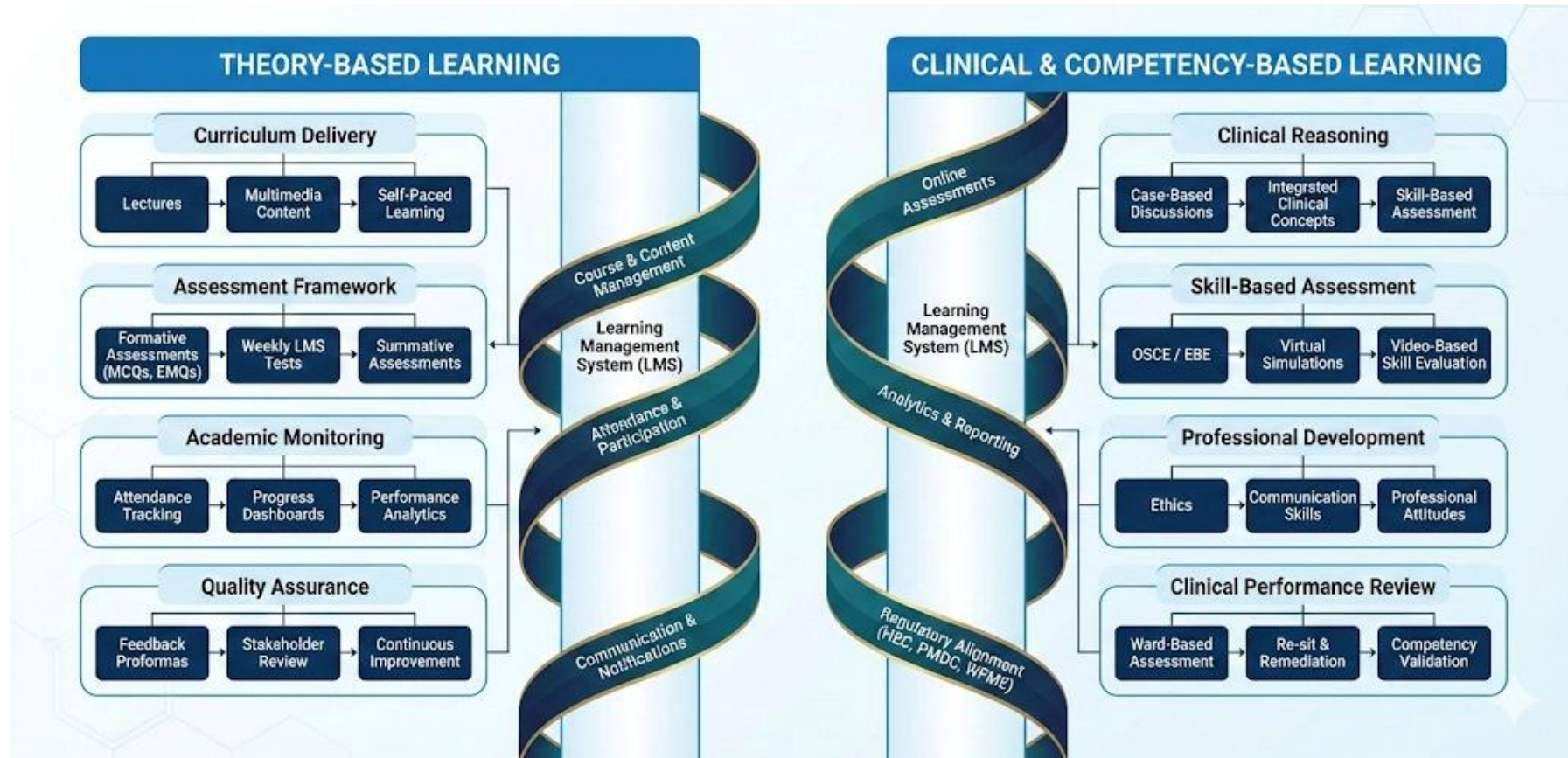
## RMU-12 Structured Framework of Integrated Modular MBBS Curriculum 2026 Isolation to Beyond Boundaries



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



## RMU-12 Structured Educational Framework of Integrated Modular MBBS Curriculum 2026 Isolation to Beyond Boundaries



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

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

RMU

Harden Level 11

Harden Level 10

Harden Level 9

Harden Level 8

MBBS Year 5

MBBS Year 3&4

MBBS Year 1&2

Rawalpindi Medical University has adopted a staged curricular framework that reflects a progressive movement along Harden’s integration ladder, culminating in going beyond the ladder to RMU Integration level 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 organized 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 joint 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

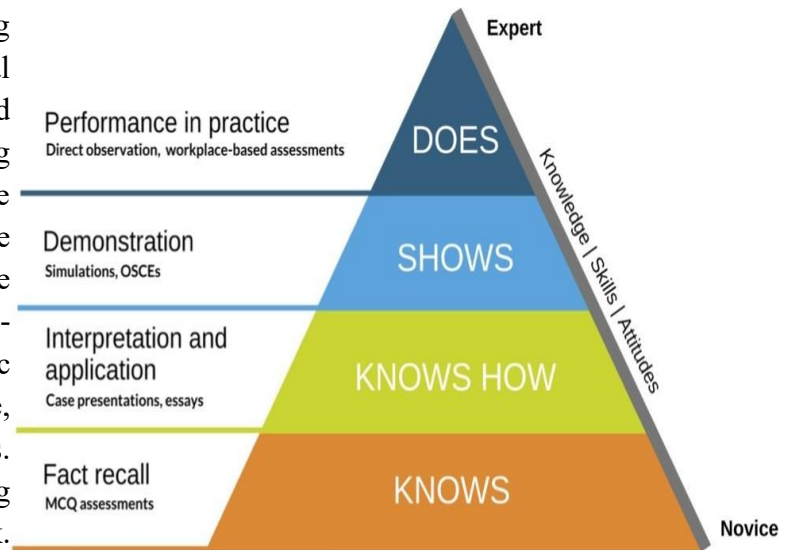
As students enter the pre-clinical phase, the curriculum transitions into a multidisciplinary and subsequently interdisciplinary design. At this stage, curricular organization shifts more clearly towards clinical systems and patient presentations, and learning outcomes emphasize the integration of knowledge, 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 familiarize students with performance-based expectations. Assessment strategies emphasize 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 organized 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 centered on performance in the workplace, using tools such as mini-CEX, DOPS, case-based discussions and multi-source feedback. Evidence from these assessments is collected longitudinally within portfolios and reviewed by entrustment or competent 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 Competency**

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.

#### **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 emphasizes 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

## PMDC STANDARDS ALIGNMENT

RMU Level 12 Integration with National Standards



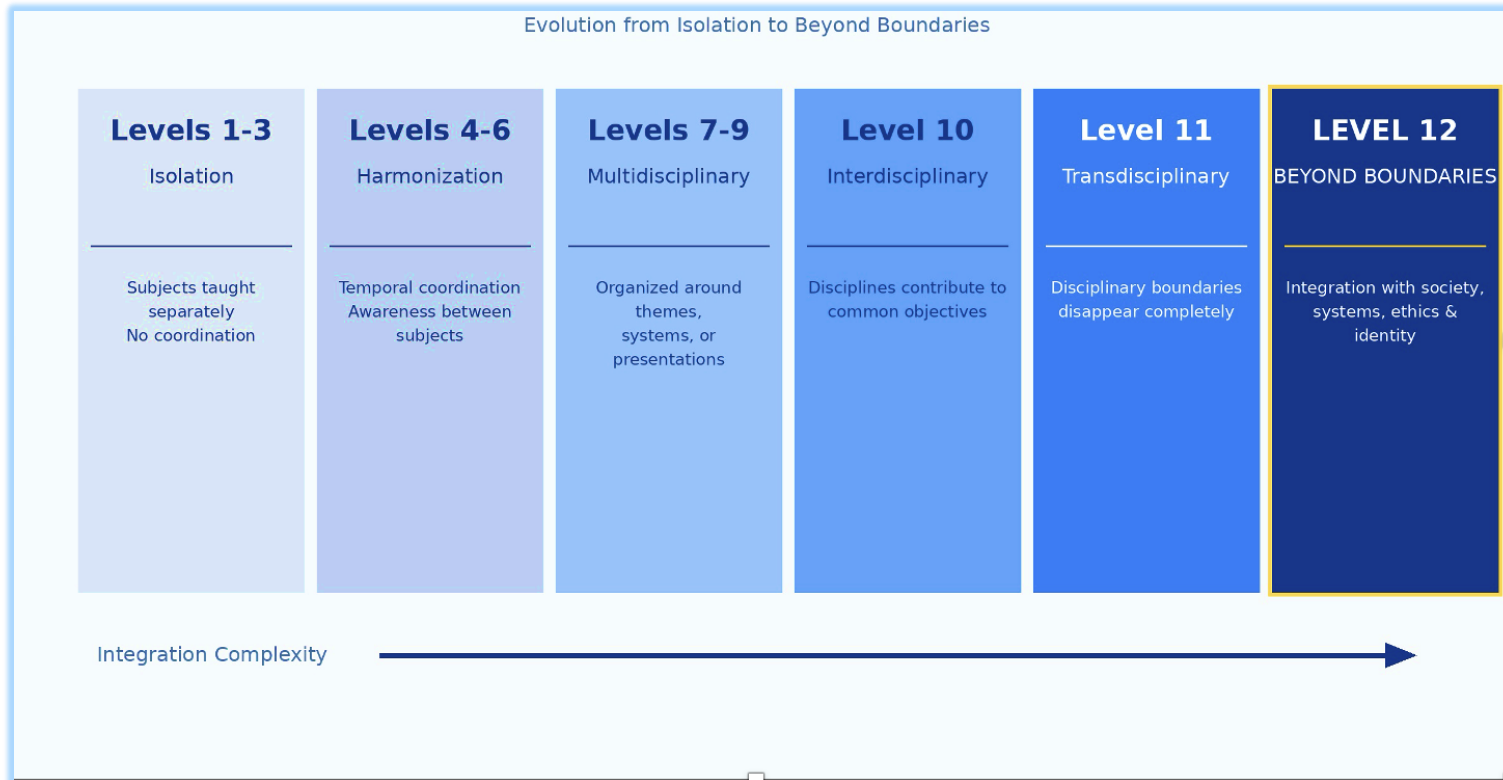
### RMU Level 12 Exceeds PMDC Requirements

By integrating clinical education with society, systems, ethics, and lifelong professional development

## 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 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

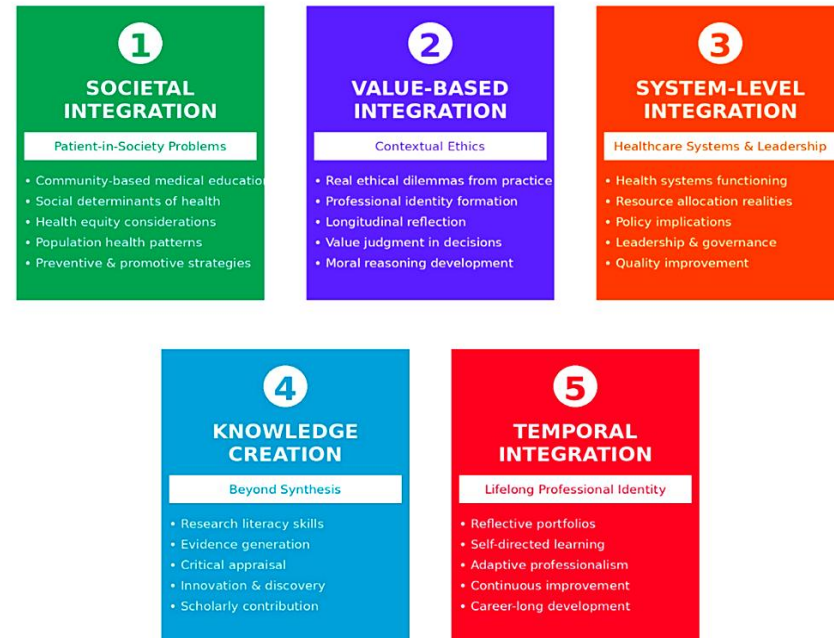
Level 11: Patient-centered clinical problems

RMU Level 12: Patient-in-society problems

RMU Implementation:

## FIVE PILLARS OF LEVEL 12 INTEGRATION

Beyond Boundaries: Comprehensive Trans-Contextual Framework



- 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

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

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

#### **D. Knowledge Creation: Beyond Synthesis**

**Level 11:** Knowledge synthesis

**RMU Level 12:** Knowledge generation

##### **RMU Implementation:**

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

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

#### **E. Temporal Integration: Lifelong Professional Identity**

**Level 11:** Competent graduate

**RMU Level 12:** Adaptive professional

##### **RMU Implementation:**

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

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

### **3.Alignment with PMDC Standards**

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

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

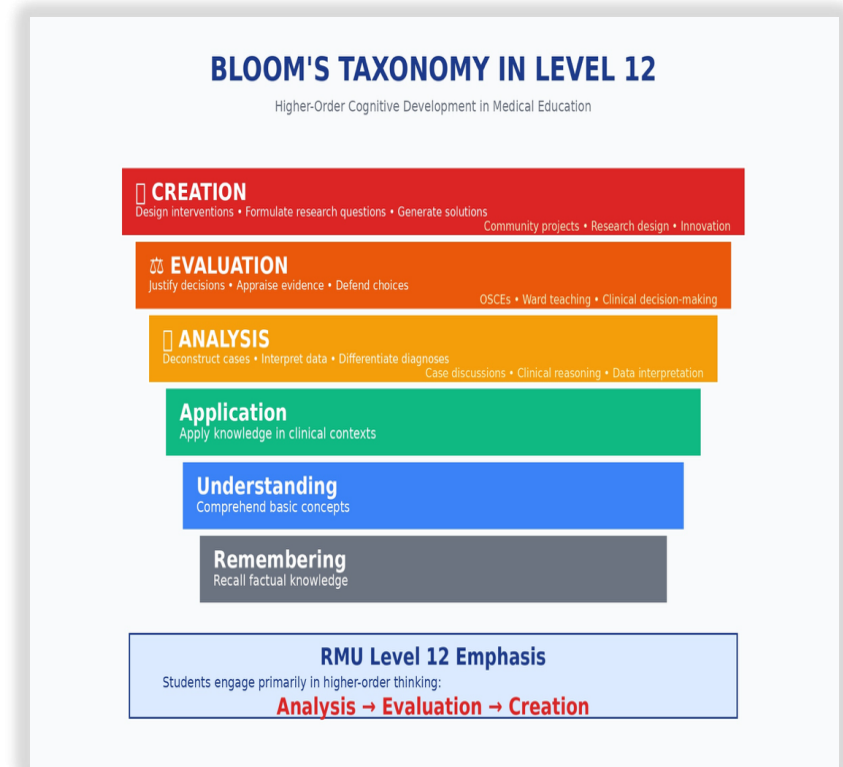
## 4. Bloom's Taxonomy & Higher-Order Thinking

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

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

### 4.1 Learning Activities Mapped to Bloom's Levels

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

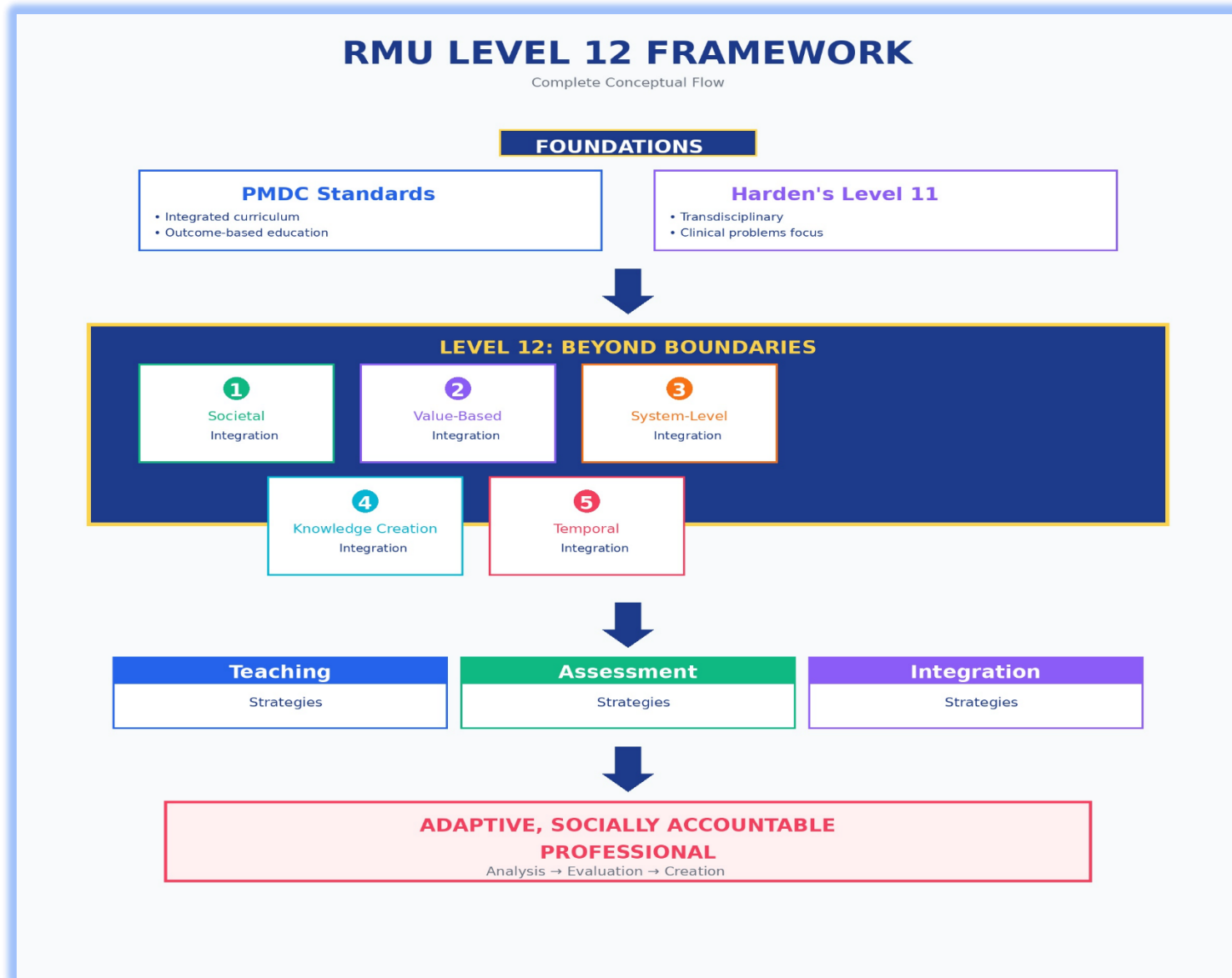
#### ▢ Lifelong Learning

Self-directed growth  
Reflective practice  
Adaptive expertise

#### ▢ Leadership

Innovation  
Change management  
Team development

**ADAPTIVE, SOCIALLY ACCOUNTABLE  
PROFESSIONAL**



## **Executive Summary**

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 -CONNECT (TRANSDISCIPLINARY CLINICAL REASONING FORUMS -TCRFs)

### Introduction:

The Clinico Connect (Transdisciplinary Clinical Reasoning Forum -TCRF) is an advanced, case-based educational encounter designed for clinical-year students. It serves as a central anchor to dissolve the boundaries between traditional disciplines, integrating foundational sciences and clinical specialties into a single, cohesive reasoning process. 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.

Unlike basic sessions, the TCRF focuses on the cognitive architecture of a physician, bridging the gap between "knowing the facts" and "thinking like a clinician." It emphasizes:

- **Mechanistic Clinical Reasoning:** Using pathophysiology to explain complex patient presentations.
- **Transdisciplinary Integration:** Merging insights from surgery, medicine, radiology, and pharmacology to form a holistic view.
- **Evidence-Based Decision Making:** Applying core principles to justify diagnostic and management choices

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

The forum 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. Transdisciplinary 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 into these concepts.

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

### 3. Integrated Discussion & Reasoning

- 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 scientific concepts dictate clinical management.
- Key take-home messages for clinical rotation are summarized.
- Opportunities for self-directed learning and further exploration are highlighted.

#### Implementation Strategy

The Transdisciplinary Clinical Reasoning Forum 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 Transdisciplinary Clinical Reasoning Forum:

- Strengthens conceptual understanding
- Fosters transdisciplinary clinical reasoning and analytical skills
- Promotes student engagement and ownership of learning
- Prepares learners to become practice-ready, concept-driven clinicians

## Example of Clinico Connect (Transdisciplinary Clinical Reasoning Forum-TCRF)

### Clinical Case Scenario: "The Post-Operative Crisis"

A 32-year-old male with a known history of intravenous drug use (IVDU) is post-op Day 3 after an emergency laparotomy for a perforated viscus. He suddenly develops high-grade fever 103° F, hypotension, and confusion. His surgical wound is erythematous with a foul-smelling, "dishwater" discharge.

#### Laboratory Findings:

- **WBC:** 22,000/uL
- **Serum Albumin:** 2.2g/dL (Marked Hypoalbuminemia)
- **Creatinine:** 2.4
- **Toxicology:** Positive for unprescribed opioids and contaminants (talc).

#### Educational Relevance to Theme

This case traces the trajectory of a systemic insult:

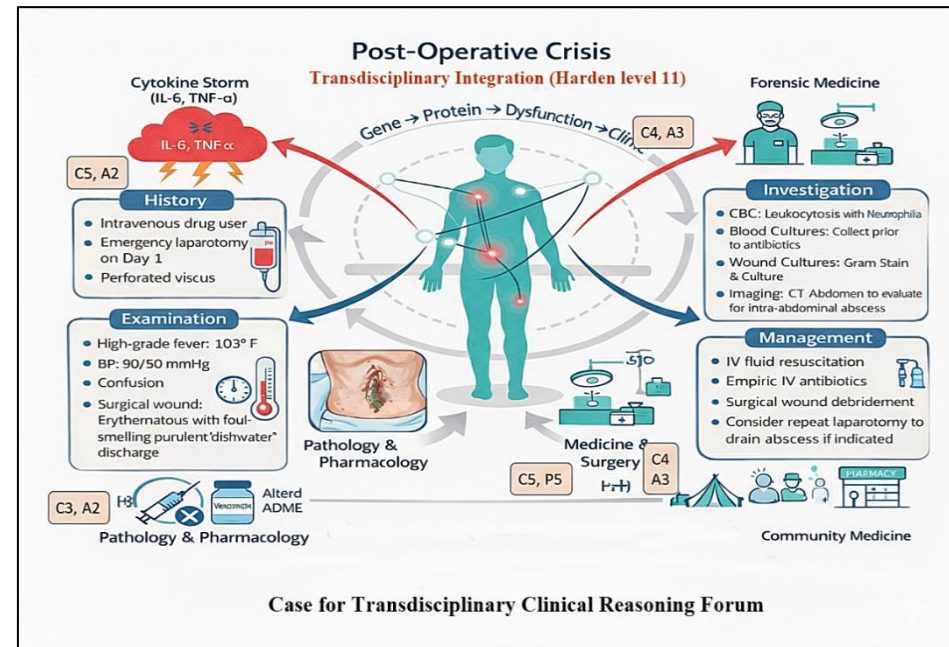
Tissue Trauma/Contaminants, Cytokine Release (IL-6, TNF-alpha), Altered Organ Physiology, Pharmacokinetic Failure, Medico-legal

Implications.

#### Transdisciplinary Integration (The Disciplines)

##### 1. Pathology: The Engine of SIRS

- **Focus:** Vascular and cellular events of acute inflammation.
- **Concept:** Explain how systemic cytokines cause "capillary leak," leading to peripheral edema and **hypoalbuminemia**.



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				

2. **Pharmacology: The Kinetic Collapse**

- **Focus:** ADME in critically ill.
- **Concept:** Analyze how low albumin increases the **free fraction** of highly protein-bound drugs (e.g., Ceftriaxone), potentially leading to toxicity despite "normal" dosing.

3. **Forensic Medicine (FM): The Chain of Custody**

- **Focus:** Injected contaminants and legal duty.
- **Concept:** Describe the acute inflammatory response to injected contaminants (talc granulomas). Discuss the legal responsibilities when treating a patient with suspected illegal drug use and the preservation of evidence from the surgical site.

4. **Medicine & Surgery: The Clinical Response**

- **Surgery:** Classify the surgical site infection (SSI) and decide on urgent re-exploration (source control).
- **Medicine:** Interpret the AKI in the context of sepsis and apply renal dosing principles for antimicrobials.

5. **Community Medicine: The Social Anchor**

- **Focus:** Prevention and harm reduction.
- **Concept:** Assess the impact of socioeconomic status on surgical outcomes and the role of community-based rehabilitation in preventing recurrent infections in IVDU populations.

6. **Behavior Sciences:**

- Demonstrate effective communication with a critically ill patient, ensuring clarity, empathy, and patient safety.

**Learning Objectives (LOs)**

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

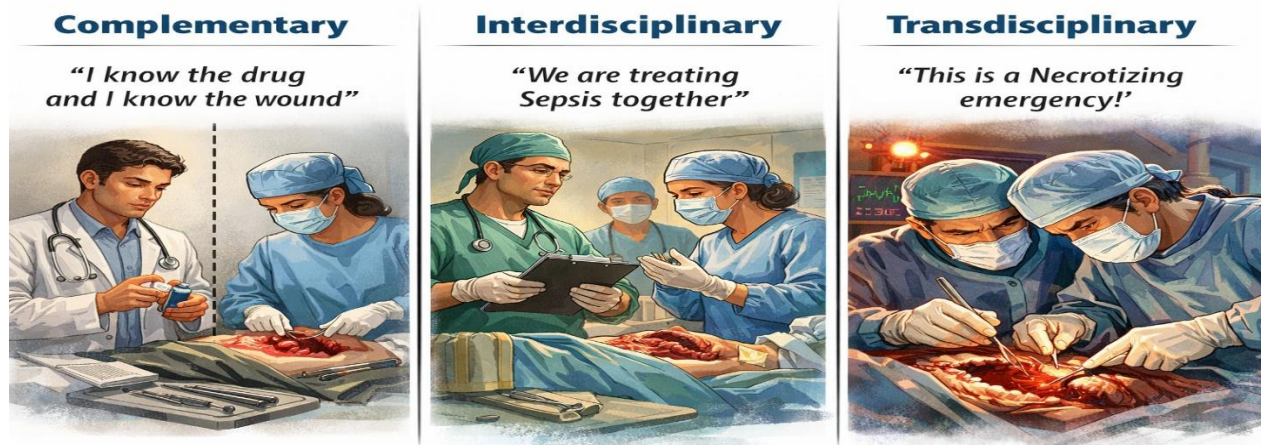
- **Explain** how inflammatory cytokines (IL-1, IL-6, TNF-alpha) suppress hepatic CYP450 enzymes.
- **Predict** alterations in drug volume of distribution (Vd) in patients with inflammatory edema.
- **Interpret** therapeutic drug monitoring (TDM) data for a patient with sepsis-associated AKI.

- **Differentiate** between legal medical practice and forensic evidence collection in trauma cases.
- **Apply** safe, evidence-based prescribing in dynamic inflammatory states.

**Explicit EPA Mapping**

Level	EPA Milestone
Level 1	Student observes the team managing the septic patient and "dishwater" wound
Level 2	Student assists with the physical exam and identifies the erythema but needs cues to recognize sepsis
Level 3	Student correctly identifies the need for Vancomycin but asks the supervisor for the specific doses.

**Mapping to Harden’s Level:**



*This scenario represents Harden Level 11 because it requires real-time, problem-centered clinical reasoning where disciplinary boundaries dissolve, and effective patient management depends on the simultaneous integration of clinical, behavioral, ethical, and systems-based competencies.”*

**Teaching Format:**

- Case based discussion
- Faculty from different backgrounds present but not teaching in silos
- Students build the care pathway themselves
- Assessment based on cognition, observation, reflection, competence and clinical reasoning

**Assessment Alignment**

<b>Domain</b>	<b>Tool</b>	<b>Weight</b>
Clinical reasoning	OSCE / AVOSPE	High
Teamwork & communication	Direct observation (rubric)	High
Knowledge integration	Case-based MCQs	Low–Moderate
Professionalism	OSPE/OSCE	Moderate

**Statement**

This TCRF session bridges the gap between pathological insult and pharmacological intervention. By integrating surgical perspective with forensic and social realities, students learn that a patient is not a static set of lab values, but a dynamic system where inflammation rewrites the rules of medicine.

## **GUIDELINES FOR CLINICO-CONNECT- (TRANSDISCIPLINARY CLINICAL REASONING FORUMS-TCRF)**

### **Background & Rationale**

The Clinico Connect - (Transdisciplinary Clinical Reasoning Forum -TCRF) is an advanced, case-based educational encounter designed for clinical-year students. It serves as a central anchor to dissolve the boundaries between traditional disciplines, integrating foundational sciences and clinical specialties into a single, cohesive reasoning process. 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.

### **Objectives/ Educational Value:**

- Integration of knowledge across disciplines
- Development of clinical reasoning and decision-making
- Promotion of collaborative learning and teamwork
- Enhancement of patient-centred approach

### **Scope & Coverage:**

- Applicable from 3rd Year MBBS to Final Year MBBS
- Basic Sciences, Paraclinical and Clinical Sciences with Disciplines of ALPHA Cluster

### **Frequency and Scheduling:**

- Medicine and Surgery (5 sessions in 10 weeks)
- Medicine Allied Specialties- 3<sup>rd</sup> Year MBBS & 4<sup>th</sup> Year (One in 2 weeks)
  - Gastroenterology, DID, Skill Lab, Radiology and ER
  - Nephrology, Family Medicine , Psychiatry , Dermatology

- Surgery Allied Specialties- 4<sup>th</sup> Year (One in 2 weeks)
  - Orthopaedics, Neurosurgery , Urology , Anaesthesia

#### ❖ **Schedule**

- One per module of clinical rotation (one/ 2 weeks, on 7th Day -Wednesday)
- Duration of session (2 hours)

#### **Session Structure and Design**

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

##### **1. Clinical Trigger (Case Introduction)**

- It can be a real patient, simulated patient, video of patient or just a scenario based on real finding

##### **2. Transdisciplinary 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 into these concepts.

##### **3. Integrated Discussion & Reasoning**

- 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 scientific concepts dictate clinical management.
- Key take-home messages for clinical rotation are summarized.
- Opportunities for self-directed learning and further exploration are highlighted.

#### **Session Format (PPT Based Delivery)**

- Each session will be conducted using a structured PowerPoint presentation
- **Contributions include:**
  - 03 slides from each major discipline

- 01 slide dedicated to Ethics and Research integration
- **Prerequisites for Session**
  - All sessions must be structured to ensure comprehensive clinical relevance and interdisciplinary integration. It is compulsory to include input from relevant clinical specialties in the planning and delivery of each session.
  - Incorporate contributions from appropriate specialties (e.g., Radiology, Medicine, Surgery, Pathology etc.) depending on the topic
  - Include Radiological correlation wherever relevant to support clinical learning
  - Encourage interactive, case-based discussion integrating multi-disciplinary perspectives
  - *Important : Failure to include relevant clinical specialties will render the session incomplete.*

### **Roles and Responsibilities**

- **Session Leader (Department of Medicine, Surgery and Medicine Allied Specialties)**
  - Responsible for selection and development of clinical case
  - Ensure alignment with curriculum and learning objectives
  - Compilation of slides from involved disciplines into one comprehensive power point presentation
  - Liaison with contributing disciplines for creation of multidisciplinary team for conduction of session
  - Manage logistics, scheduling, and communication
  - Ensure availability of venue and AV resources
  - Maintain attendance and session records
- **Multidisciplinary Team:**
  - Contribute discipline-specific content (PPT slides)
  - SR and above from all involved disciplines for integrated discussion and student engagement
- **Students:**
  - Prepare in advance and actively participate
  - Demonstrate clinical reasoning and teamwork
  - Engage in reflection and self-directed learning

- **DME Unit**
- Monitor quality assurance, scheduling, and evaluation through a pre validated checklist

### **Documentation and Record Keeping**

- Attendance records will be maintained by the Session Coordinator and submitted to the Department of Medical Education (DME).
- A session report will be prepared after each Clinico Connect (TCRF) session and forwarded to DME.
- The report will include pictorial evidence (e.g., photographs of session activities) to ensure documentation and quality assurance.

### **Assessment and Marking Scheme**

#### **Session Assessment Guideline**

Each session will be formally assessed as part of the Continuous Internal Assessment (CIA). The evaluation will be based on the following components:

- **Attendance:** Attendance is mandatory and will contribute to the overall session score.
- **MCQ Assessment:** Each session will include a set of **10 Multiple Choice Questions (MCQs)** designed to assess understanding of the session content.

The scores obtained from attendance and MCQs will be **combined and added in proportionate weightage** to the Continuous Internal Assessment.

Regular participation and satisfactory performance in these components are essential for maintaining academic progress.

## **SECTION-III**

### **Structured Framework of RMU-12 Integrated Modular MBBS Curriculum 2026**

**Structured Framework of RMU-12 Integrated Modular MBBS Curriculum 2026**

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

## Academic Calendar 3<sup>rd</sup> Year MBBS-2026-2027

### Batch 51

Blocks		Block-VII	Block-VIII	Block-IX	Send up and Prof
Dates	Duration in Weeks/Days	Module			
18 <sup>th</sup> Feb-14 <sup>th</sup> March 2026	4 Weeks	Foundation Module-II			
16 <sup>th</sup> -18 <sup>th</sup> March 2026	3 Days	Module Assessment			
19 <sup>th</sup> -28 <sup>th</sup> March 2026	9 days	Eid ul Fitr & Conference Break			
30 <sup>th</sup> March-09 May <sup>th</sup> 2026	3 weeks	Foundation Module-III			
6 <sup>th</sup> April -13 <sup>th</sup> April 2026	2 weeks	Spring and Student week			
11 <sup>th</sup> May- 18 <sup>th</sup> May 2026	01 week	Block Assessment			
20 <sup>th</sup> May <sup>s</sup> -18 <sup>th</sup> July 2026	5 weeks	GIT, Hepatobiliary & Parasitology-II			
27 <sup>th</sup> May -30 <sup>th</sup> June 2026	4 days	Eid ul Azha			
22 <sup>nd</sup> June -11 <sup>th</sup> July 2026	3 Weeks	Summer Vacation			
20 <sup>th</sup> July – 22 <sup>nd</sup> July 2026	3 Days	Module Assessment			
23 <sup>rd</sup> July -29 <sup>th</sup> Aug 2026	5.5weeks	Microbes & Anti-microbes			
31 <sup>st</sup> Aug-7 <sup>th</sup> Sept 2026	1 Week	Block Assessment			
8 <sup>th</sup> Sept-10 <sup>th</sup> Oct 2026	5 Weeks	Hematology & Immunology -II			
12 <sup>th</sup> Oct -14 <sup>th</sup> Oct 2026	3 Days	Module Assessment			
15 <sup>th</sup> Oct -14 <sup>th</sup> Nov 2026	4.5 Weeks	CVS & Respiration-II			
16 <sup>th</sup> Nov -23 <sup>rd</sup> Nov 2026	01 week	Block Assessment			
24 <sup>th</sup> Nov- 05 <sup>th</sup> Dec 2026	02 Weeks	GEC Module			
7 <sup>th</sup> Dec -12 <sup>th</sup> Dec 2026	01 1week	Prep Leaves for Send Up			
14 <sup>th</sup> Dec -24 <sup>th</sup> Dec 2026	11 Days	Send Up			
25 <sup>th</sup> Dec- 23 <sup>rd</sup> Jan 2027	04 weeks	Prep Leaves for Professional			
25 <sup>th</sup> Jan -26 <sup>th</sup> Feb 2027	5 weeks	Professional Examination			

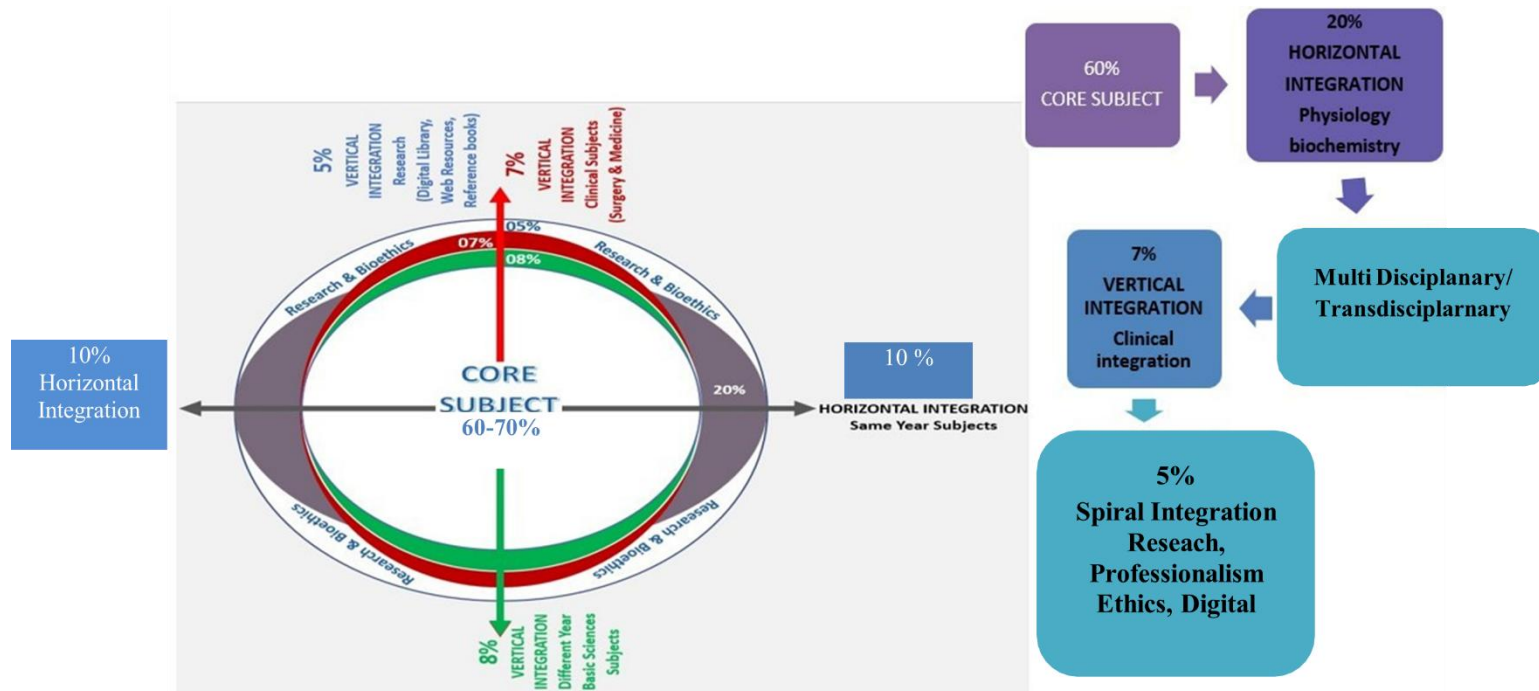
## **SECTION IV**

### **TEACHING & LEARNING STRATEGIES/METHODOLOGIES**

- Large Group Interactive Session (LGIS)
  - Small Group Discussion (SGD)
  - Self-Directed Learning (SDL)
  - Case Based Learning (CBL)
  - Skill Labs/Practicals (SKL)

## Teaching and Learning Methodologies / Strategies Large Group Interactive Session (LGIS)

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



**Prof Umar's Model of Integrated Lecture**

### Small Group Discussion (SGD)

This format helps students 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’s role is to ask probing questions, summarize and help to clarify the concepts.

**Table 2. Standardization of teaching content in SGD**

S.No	Topics	Approximate %
1	Title Of SGD	
2	Learning Objectives from Study Guide	
3	Horizontal Integration	24%
4	Core Concepts of the topic	60%
5	Vertical Integration	8%
6	Related Advance Research points	8%
7	Related Ethical points	
8	Artificial Intelligence	
9	Family Medicine	

**Table 3. Steps of Taking SGD**

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

### **Self- Directed Learning (SDL)**

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

### **Case Based Learning (CBL)**

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

**Practical Sessions/Skill Lab (SKL)**

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

**SECTION V**  
**COURSE CONTENT**

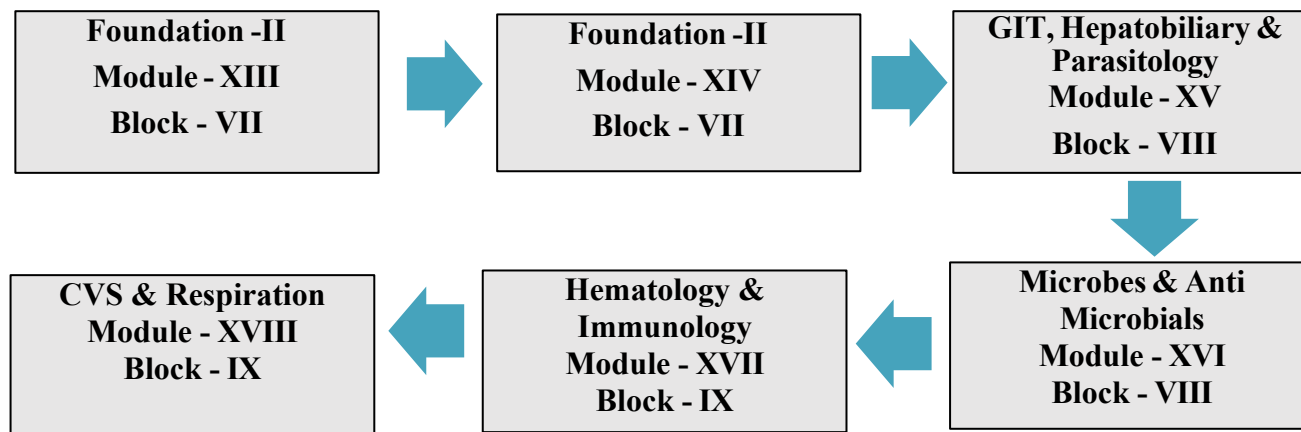
## Introduction to Paraclinical Sciences

The third year of the Bachelor of Medicine, Bachelor of Surgery (MBBS) program marks a pivotal transition from foundational medical knowledge to the practical application of skills in clinical settings. During this year, students will immerse themselves in clinical clerkships, which provide invaluable opportunities to engage with patients, collaborate with healthcare teams, and apply theoretical knowledge in real-world scenarios.

The curriculum is designed to enhance students' clinical reasoning and diagnostic skills through a combination of hands-on experiences and structured learning. Clinical clerkships will cover a range of specialties, allowing students to observe and participate in patient care under the guidance of experienced clinicians. This experiential learning is complemented by classroom-based education, where students will study relevant clinical topics, engage in case discussions, and develop critical thinking abilities.

Emphasizing the importance of compassionate patient care, ethical practice, and effective communication, this curriculum aims to prepare students for the complexities of modern medicine. By the end of the third year, students will have gained essential clinical skills and a deeper understanding of patient-centered care, laying a strong foundation for their subsequent years of training and future practice as medical professionals.

Through this integrated approach, we aspire to cultivate competent, empathetic, and reflective practitioners who are equipped to meet the challenges of the healthcare landscape.



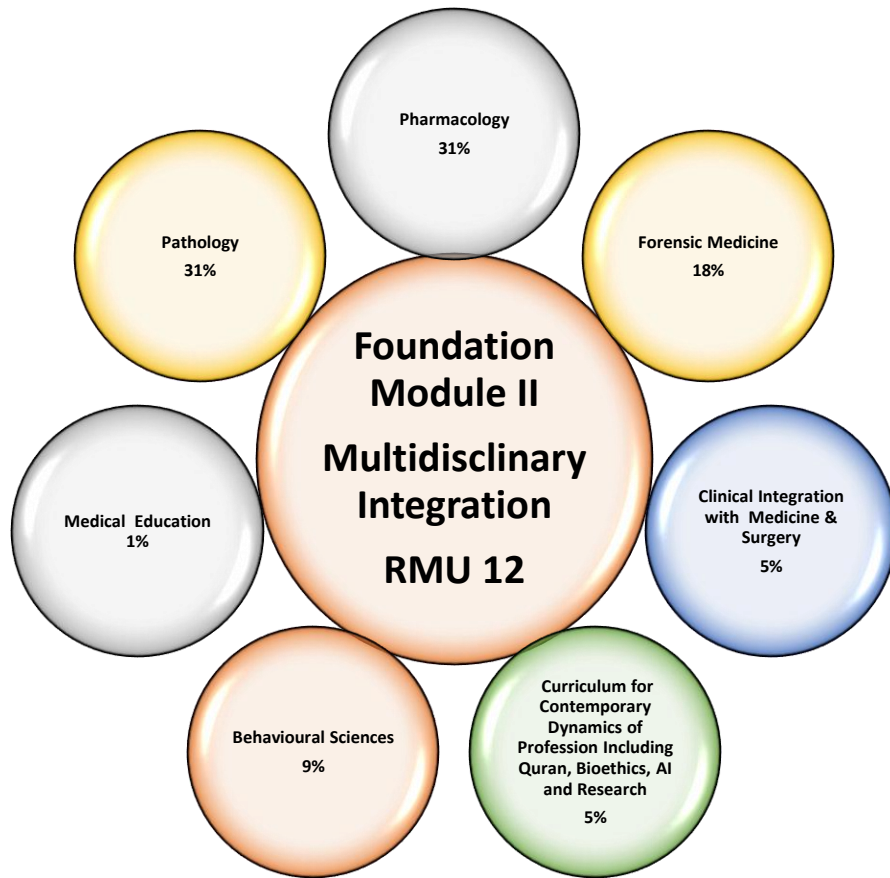
**RMU – 12 Integrated Modular MBBS Curriculum 2026**  
**Isolation to Beyond Boundaries**

**Third Year MBBS 2026**

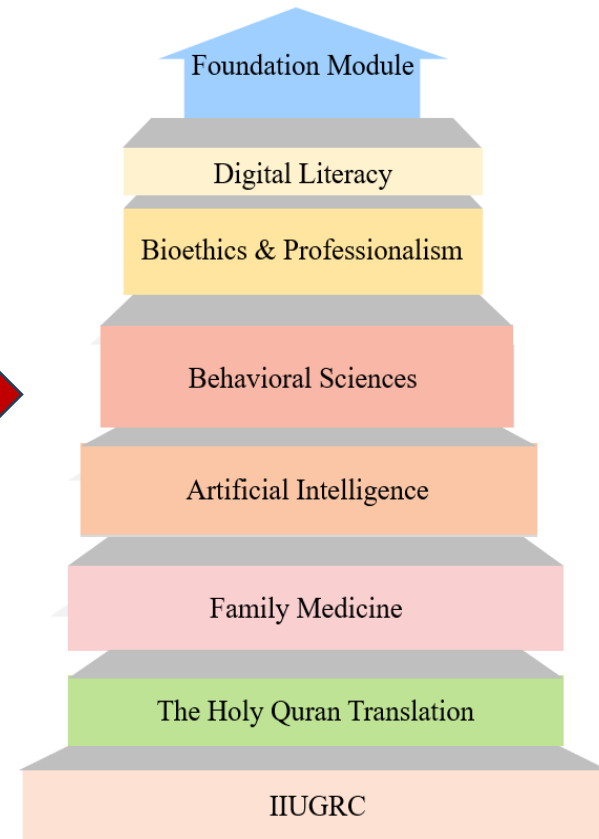
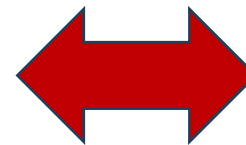
**BLOCK VII**

**Foundation Module -II**

## Multidisciplinary Approach for Foundation II Module RMU-12 Isolation to Beyond Boundaries



**Disciplines in Foundation Module-II**



**Spiral / General Education Cluster Courses (5%)**

**Discipline Wise Details of Modular Content**

		Discipline	Content
F O U N D A T I O N	<b>Module Orientation</b>		
	<b>Department of Medical Education</b>	<ul style="list-style-type: none"> <li>• Interplay of Paraclinical Sciences.</li> <li>• Navigation to module requirements.</li> <li>• Application of Professional ethics.</li> </ul>	
	<b>Core Components</b>		
	<b>Pharmacology</b>	<ul style="list-style-type: none"> <li>• General Pharmacology                             <ul style="list-style-type: none"> <li>• Pharmacokinetic Processes and Principles</li> <li>• Pharmacodynamic Processes and principles</li> <li>• Pharmacogenomics</li> </ul> </li> </ul>	
	<b>Pathology</b>	<ul style="list-style-type: none"> <li>• Types of cell injury (Reversible and irreversible cell injury)</li> <li>• Acute and chronic inflammation, its consequences and diagnosis</li> <li>• Control of normal cell growth and tissue repair mechanisms</li> </ul>	
	<b>Forensic Medicine</b>	<ul style="list-style-type: none"> <li>• Introduction to Forensic Medicine</li> <li>• Personal Identity</li> <li>• Legal Aspects of Medical practice</li> </ul>	
	<b>Spiral Component</b>		
	<b>Family Medicine</b>	<ul style="list-style-type: none"> <li>• Ethics in primary care</li> </ul>	
	<b>Behavioral Sciences</b>	<ul style="list-style-type: none"> <li>• Psychosocial assessment</li> <li>• Non-pharmacological management</li> <li>• Informational Care</li> </ul>	
	<b>Integrated Undergraduate Research</b>	<ul style="list-style-type: none"> <li>• Introduction to Inferential statistics</li> <li>• Normal Distribution Curve</li> <li>• Hypothesis Testing</li> </ul>	

<b>M o d u l e  II</b>	<b>Vertical Component</b>	
	<b>Medicine</b>	<ul style="list-style-type: none"><li>• Introduction to Internal Medicine</li><li>• Foundation Of Medical Ethics</li><li>• Inflammation and its Medical Implications</li><li>• Physiological response to infection</li><li>• Symptoms Analysis and Interpretation in Clinical Practice -I</li><li>• Symptoms Analysis and Interpretation in Clinical Practice -II</li></ul>
	<b>Surgery</b>	<ul style="list-style-type: none"><li>• Surgical ethics</li><li>• Patient safety and quality improvement</li><li>• Surgical Infections</li><li>• Sterilization and Disinfection</li><li>• Metabolic response to injury</li><li>• Wound repair healing</li></ul>
	<b>Weekly Joint sessions for Multidisciplinary Integration</b>	

### Foundation Module Team

Module Name	Foundation Module II				
Duration of module	04 Weeks				
Coordinator	Dr. Zari Salahuddin				
Co-coordinator	Dr. Aisha Anwar				
Reviewed by	Module Committee				
Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Zari Salahuddin (AP Pharmacology)
2.	Director DME & Deam Basic Sciences	Prof. Dr. Ifra Saeed	2.	Co-coordinator (Pharmacology)	Dr Aisha Anwar
3.	Convener Curriculum	Prof. Dr. Naeem Akhter	3.	Co-coordinator (Pathology)	Dr. Faiza Zafar
4.	Additional Director DME (NTB)	Dr. Kholah Noreen	4.	Co-coordinator (Forensic Medicine)	Dr. Shahrukh
5.	Chairperson Pharmacology	Dr. Zunera Hakim			
6.	Chairperson Pathology	Prof. Dr. Fatima Tuz Zahra			
7.	Chairperson Forensic Medicine	Dr. Filza Ali	<b>DME Implementation Team</b>		
			1.	Director DME	Prof. Dr. Ifra Saeed
8.	Focal Person Medicine	Dr Saima Ambreen	2.	Implementation Incharge 3 <sup>rd</sup> Year MBBS	Dr. Zunera Hakim
9.	Focal Person Surgery	Dr Asifa Dain	3.	Additional Director DME	Dr. Kholah Noreen
10.	Focal Person Behavioral Sciences	Dr. Zona Tahir			
11.	Focal Person Community Medicine	Dr. Affifa Kulsoom			
12.	Chairperson Family Medicine	Dr. Sadia Azam Khan			

## Module I - Foundation Module-II

**Introduction:** *“Welcome to the Foundation-II Module, where we bridge basic sciences with clinical reality through an integrated study of disease mechanisms (Pathology), the science of healing (Pharmacology), and the intersection of medicine and the law (Forensic Medicine). This module is designed to shift the focus from 'what' happens in the body to 'how' we diagnose, treat, and investigate medical cases within a legal framework. By mastering these pillars, students will develop the critical diagnostic and ethical reasoning essential for your upcoming clinical clerkships.”*

**Rationale:** The rationale of this module serves as the **foundational bridge** between basic sciences (Pharmacology/Pathology) and clinical practice. It transitions the student from studying the "healthy body" to understanding the "malfunctioning body" and the physician's role in treating it and upholding the law.

### Module Outcomes

Each student will be able to:

#### Knowledge

- Acquire knowledge about the basic terminologies used in Pharmacology, Pathology & Forensic Medicine as well as the concepts of diseases in the community
- Use technology based medical education including Artificial Intelligence.
- Appreciate concepts & importance of Family Medicine, Biomedical Ethics and Research.

#### Skills

- Interpret and analyze various practical Para-clinical Sciences

#### Attitude

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

This module will run in 4 weeks' duration. The content will be covered through introduction of topics. Instructional strategies are given in the timetable and learning objectives are given in the study guides. Study guides will be uploaded on the university website.

## Themes, Learning Objectives, Teaching Strategies & Tool of Assessments

### Contents

#### Horizontally Integrated Basic Sciences (Pharmacology, Pathology & Forensic Medicine)

- **Large Group Interactive Session:**
  - Pharmacology (LGIS)
  - Pathology (LGIS)
  - Forensic Medicine (LGIS)
  
- **Small Group Discussions:**
  - Pharmacology (SGD)
  - Pathology (SGD)
  - Forensic Medicine (SGD)
  
- **Self-Directed Topic, Learning Objectives & References**
  - Pharmacology (SDL)
  - Pathology (SDL)
  - Forensic Medicine (SDL)
  
- **Skill Laboratory**
  - Pharmacology (SKL)
  - Pathology (SKL)
  - Forensic Medicine (SKL)

## ORIENTATION DAY

### Introduction to New Teaching Block & Hospital Disciplines

Topic	Facilitator	Learning Objectives
Introduction to RMU and Allied Hospitals	<b>Vice Chancellor</b>	Honorable VC will welcome and introduce the University and Allied Hospitals.
Introduction to Medical Education Department	<b>Additional Director DME</b>	<ul style="list-style-type: none"> <li>• Introduce DME</li> </ul>
		<ul style="list-style-type: none"> <li>• Define Medical Education</li> </ul>
		<ul style="list-style-type: none"> <li>• Appreciate role of DME in their curriculum</li> </ul>
		<ul style="list-style-type: none"> <li>• Introduce academic regulations and feedback mechanisms</li> <li>• Introduce available academic support systems and grievance redressal pathways.</li> </ul>
Introduction to Para-Clinical Sciences	<b>Implementation In charge 3<sup>rd</sup> Year MBBS</b>	<ul style="list-style-type: none"> <li>• Introduction to Paraclinical Departments</li> </ul>
		<ul style="list-style-type: none"> <li>• Explain the scope and relevance of para-clinical disciplines in bridging basic and clinical sciences</li> <li>• Discuss Teaching &amp; Learning strategies and assessment policy</li> </ul>
Introduction to Medicine & Surgery	<b>Dean of Medicine &amp; Surgery</b>	<ul style="list-style-type: none"> <li>• Describe the overall structure and objectives of Medicine and Surgery specialties in 3<sup>rd</sup> Year</li> </ul>
		<ul style="list-style-type: none"> <li>• Introduce different clinical wards, units and their respective functions.</li> </ul>
		<ul style="list-style-type: none"> <li>• Explain rotation schedules, attendance requirements, and assessment components.</li> <li>• Discuss the expected professional behavior and ethical conduct within clinical wards.</li> </ul>

**Foundation II Module – 3<sup>rd</sup> Year MBBS****Duration: 4 weeks**

<b>Sr. No</b>	<b>Theme</b>	<b>Duration</b>
1	Foundation of Safe Medical Practice and Patient Care	1 <sup>st</sup> WEEK
2	Rational Drug Use in Inflammation, Infection, and Tissue Injury	2 <sup>nd</sup> & 3 <sup>rd</sup> WEEK
3	From Drug Receptor Interaction to Therapeutic Response	4 <sup>th</sup> WEEK

Theme 1: Foundation of Safe Medical Practice and Patient Care (Week 1)		
Week	Rationale	General learning objectives
<b>1</b>	<p>The practice of medicine does not occur in academic silos; a physician in any medical department does not see "Pathology" or "Pharmacology" in isolation, but rather as a patient whose life depends on the integration of these sciences. This theme serves as a transdisciplinary bridge designed to transform the 3rd-year student from a learner of facts into a clinical problem-solver. By the end of this theme, the student will perceive all clinical cases not as a series of disparate symptoms, but as a complex interplay of pathophysiological mechanisms, legal identities, and psychosocial narratives. This integrated approach ensures that the future physician is equipped to intervene safely, legally, and ethically in the most critical moments of patient care.</p>	<p>By the end of this theme, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the significance of various routes of drug administration in producing drug action and toxicity.</li> <li>2. Differentiate between reversible and irreversible cell injury in different clinical conditions</li> <li>3. Define the scope and role of forensic medicine and its relevance to clinical practice.</li> <li>4. Describe basic legal frameworks concerning health care.</li> <li>5. Integrate knowledge of medico-legal evidence and ethics in patient care</li> <li>6. Outline medico-legal responsibilities (documentations, certificates) of a physician to ensure safe medical practice</li> <li>7. Demonstrate principles of psychosocial assessment.</li> <li>8. Conduct a basic psychosocial assessment of a patient</li> <li>9. Interpret basic epidemiological data related to substance abuse.</li> <li>10. Demonstrate awareness of patient safety principles and ethical considerations in medical and surgical care.</li> </ol>
<p><b>Case based discussion for Transdisciplinary Clinical Reasoning Forum</b>  <b>Case 1: “When Consciousness Is Lost: A Case of Drug Intake, Patient Safety, and Medico-Legal Responsibility”</b>                      A 21-year-old male medical student is brought to the emergency department by hostel mates after being found unconscious in his room. According to friends, he had complained of headache and anxiety earlier in the day and had taken “some tablets,” the exact name and dose of which are unknown. There is no history of trauma, fever, or seizures. His medical history is not known. • Empty blister pack of sedative tablets found in patient’s belongings.  <b>Clinical Examination:</b>                      Level of consciousness: Reduced (responds to pain only)                      Blood Pressure: 100/60 mmHg</p>		

Pulse: 96/min

Respiratory Rate: 10–12/min

No external injuries noted

**Laboratory & Initial Investigations**

Random Blood Glucose: Normal

Serum Electrolytes: Within normal limits

Arterial Blood Gas: Mild respiratory acidosis

Urine Output: Reduced

**Educational Relevance to Theme**

Importance of accurate drug history and dose awareness

Early cellular effects of hypoxia due to hypoventilation

Patient safety in unconscious individuals

Consent issues in emergency care

Recognition of a medico-legal case

Role of documentation, evidence, and legal procedures

**Disciplines Involved**

**Pharmacology:** Drug dosage, route of administration, and toxicity, Importance of rational prescribing

**Pathology:** Cellular response to hypoxia, Reversible vs irreversible cell injury, Early stress responses at the cellular level

**Medicine:** Clinical assessment of an unconscious patient, Interpretation of basic investigations, Monitoring and ensuring patient safety

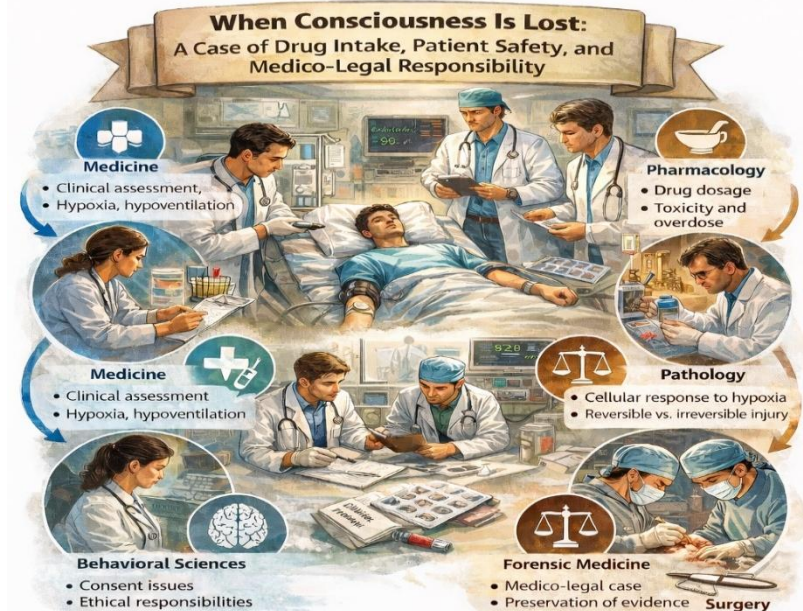
**Forensic Medicine:** Identification of a medico-legal case, Importance of documentation and evidence preservation, Role of medico-legal clinics and autopsy services

**Behavioral Sciences:** Consent in emergency situations, Ethical responsibility in patient care, Disclosure, confidentiality and communication with family

**Surgery:** Airway protection, intubation, ventilatory support if condition deteriorates

**Community Medicine:** substance misuse awareness & community based preventive strategies

**How This Case Fits the Theme** This case highlights how a seemingly routine emergency presentation can evolve into a situation involving clinical decision-making, ethical judgment, and legal responsibility. It emphasizes the foundational principles of safe patient care, professional duties, and medico-legal awareness expected from future physicians.



**How it depicts Harden’s Level 11**

*“This scenario is Harden Level 11 because safe patient management depends on real-time integration of pharmacological, pathological, clinical, ethical, legal, and public-health reasoning, with no discipline functioning independently.”*

This case meets Harden 11 criteria: Problem-Centred, Not Subject-Based

Learners are NOT asked:

- Explain drug toxicity
- Define reversible injury

They are asked:

**“What do you do now — clinically, ethically, legally?”**

## SPECIFIC LEARNING OBJECTIVES

### Horizontally Integrated Basic Sciences (Pharmacology, Pathology & Forensic Medicine)

Code	Topic	Learning Objectives	Learning Domain	Calgary Gauge	Teaching Strategy	Assessment
<b>PHARMACOLOGY</b>						
M1-FM-PH-001	<b>Absorption of drugs</b>	<ul style="list-style-type: none"> <li>Define absorption of drugs.</li> <li>Describe the processes by which drugs are absorbed through different barriers.</li> </ul>	C1	Must Know	LGIS	MCQ SAQ/SEQ VIVA
			C2	Must Know		
M1-FM-PH-018	<b>Routes of drug administration and dosage forms</b>	<ul style="list-style-type: none"> <li>Enlist different routes of drug administration</li> <li>Discuss the merits and demerits of each route of administration</li> </ul>	C1	Must Know	SGD	MCQs SAQs VIVA
			C2	Must Know		
M1-FM-PH-019	<b>Factors affecting absorption of drugs</b>	<ul style="list-style-type: none"> <li>Enumerate different dosage forms</li> <li>Discuss the utility of different dosage forms in different clinical situations</li> <li>Discuss different drug and body-based factors affecting absorption of drugs</li> </ul>	C1	Must Know	SGD	MCQs SAQs VIVA
			C2	Must Know		
			C2	Must Know		
M1-FM-PH-021	<b>Drug development and new therapeutic approaches</b>	<ul style="list-style-type: none"> <li>Define drug</li> <li>Identify sources of drug</li> <li>Discuss the phases of drug development</li> <li>Outline the new therapeutic approaches</li> </ul>		<ul style="list-style-type: none"> <li>Domingo-Fernández D, Gadiya Y, Preto AJ, Krettler CA, Mubeen S, Allen A, Healey D, Colluru V. Natural products have increased rates of clinical trial success throughout the drug development process. <i>Journal of Natural Products</i>. 2024 Jul 6;87(7):1844-51.</li> <li>Sun D, Gao W, Hu H, Zhou S. Why 90% of clinical drug development fails and how to improve it? <i>Acta Pharmaceutica Sinica B</i>. 2022 Jul 1;12(7):3049-62.</li> </ul>		MCQs
				<a href="https://www.youtube.com/watch?v=kQ18rDhh-yko">https://www.youtube.com/watch?v=kQ18rDhh-yko</a>		

M1-FM-PH-027	<b>Pharmacological Calculations-I</b>	<ul style="list-style-type: none"> <li>Master fundamental skills in calculating drug dosages based on patient weight, age, and other relevant factors.</li> </ul>	P-1	Must Know	SKILL	OSPE
		<ul style="list-style-type: none"> <li>Develop proficiency in calculating pediatric drug dosages, considering age-appropriate formulations and dosage forms.</li> </ul>	P-1	Must Know		
<b>PATHOLOGY</b>						
M1-FM-PATH-001	<b>Reversible and irreversible cell injury</b>	<ul style="list-style-type: none"> <li>Define Ischemia and cell injury</li> </ul>	C1	Must know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Define Reversible and Irreversible Cell injury</li> </ul>	C1	Must know		
		<ul style="list-style-type: none"> <li>Describe causes of cell injury and ischemia,</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Describe morphology of reversible &amp; irreversible cell injury</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Explain depletion of ATP, mitochondrial damage and dysfunction, influx of Calcium and loss of calcium, hemostasis, free radical injury (oxidative stresses), defects in membrane permeability, damage to DNA and protein.</li> </ul>	C2	Must know		
M1-FM-PATH-002	<b>Cellular Adaptations</b>	<ul style="list-style-type: none"> <li>Define adaptation</li> </ul>	C1	Must know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Classify types of adaptation</li> </ul>	C1	Must know		
		<ul style="list-style-type: none"> <li>Describe mechanisms of hypertrophy hyperplasia, atrophy and metaplasia</li> </ul>	C2	Need to know		
		<ul style="list-style-type: none"> <li>Classify various cellular adaptations to stress</li> </ul>	C1	Must know		
		<ul style="list-style-type: none"> <li>Explain the differences between physiological and pathological adaptations with examples</li> </ul>	C1	Should know		
		<ul style="list-style-type: none"> <li>Discuss the reversibility of cellular adaptations and their potential progression to irreversible injury or malignancy</li> </ul>	C3	Nice to know		

M1-FM-PATH-019	<b>Pathological Calcifications</b>	<ul style="list-style-type: none"> <li>Explain causes of calcification in given scenario</li> </ul>	C2	Must know	CBL	PBQs
		<ul style="list-style-type: none"> <li>Discuss other sites and types of calcifications</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Discuss morphological appearance and complications of calcification</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Differentiate between various types of calcifications with respect to their sites and association with different pathological conditions</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Apply knowledge in identifying the significance of calcification with normal and abnormal pathological circumstances</li> </ul>	C4	Should know		
		<ul style="list-style-type: none"> <li>Demonstrate collaborative teamwork and problem-solving aptitude</li> </ul>	A3	Should know		
		<ul style="list-style-type: none"> <li>Describe wound remodeling, formation of granulation tissue and complications of wound healing.</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Apply his/her knowledge to identify the mechanism of healing in different circumstances</li> </ul>	A2	Must know		
		<ul style="list-style-type: none"> <li>Demonstrate critical thinking attitude needed for application of basic knowledge into clinical situations.</li> </ul>	A3	Must know		
M1-FM-PATH-011	<b>The genome and cellular house keeping</b>	<ul style="list-style-type: none"> <li>Describe the components and regulators of gene function</li> <li>Describe the functions of coding and non-coding genome</li> <li>Describe the components of cells and regulation of cell function</li> </ul>	Robbins & Cotran Pathologic Basis OF Disease 10 <sup>th</sup> Edition , Chapter 1 Pg 1--15			MCQs
M1-FM-PATH-015	<b>Cellular adaptations to stress</b>	<ul style="list-style-type: none"> <li>Classify various cellular adaptations to stress</li> </ul>	C1	Must know	SKILL	OSPE
		<ul style="list-style-type: none"> <li>Identify various clinical conditions which lead to hypertrophy, atrophy and metaplasia</li> </ul>	P2	Must know		
		<ul style="list-style-type: none"> <li>Identify the morphology of hypertrophy, atrophy and metaplasia</li> </ul>	P2	Must know		

		<ul style="list-style-type: none"> <li>• Demonstrate positive attitude towards safe handling of laboratory specimens</li> </ul>	A3	Must know		
<b>FORENSIC MEDICINE</b>						
M7-FM-F001	<b>Introduction to Forensic Medicine</b>	<ul style="list-style-type: none"> <li>• Define forensic medicine, state medicine &amp; medical jurisprudence</li> <li>• Enlist different branches of forensic medicine.</li> <li>• State the importance of medicolegal clinics, autopsy rooms, laboratory services.</li> <li>• Briefly describe the requirements of autopsy room.</li> </ul>	Must know Must know Should know Must know	C1 C1 C2 C2	LGIS	MCQs SAQs VIVA
M7-FM-F002	<b>Legal Aspects of Medical practice-I</b> Courts and legal procedures in Pakistan	<ul style="list-style-type: none"> <li>• Define law, Statute law, Common law, civil law and criminal law.</li> <li>• Define Inquest with examples of its application in medico-legal work.</li> <li>• Describe various methods of judicial investigations</li> <li>• State Different types of Courts and their power of jurisdiction</li> </ul>	Must know Must know Should know Should know	C1 C2 C2 C2	LGIS	MCQs SAQs VIVA
M7-FM-F003	<b>Legal Aspects of Medical practice-II</b> Medico-legal Importance of Evidence and witness	<ul style="list-style-type: none"> <li>• Enumerate and briefly describe the different types of evidence.</li> <li>• Briefly explain the admissibility of evidence in court.</li> <li>• Differentiate between dying declaration and dying deposition.</li> <li>• Briefly explain the stages of evidence in court.</li> </ul>	Must know Should know Must know Nice to know	C1 C2 C2 C2	LGIS	MCQs SAQs VIVA
M7-FM-F004	<b>Legal Aspects of Medical practice-III</b> Medical Ethics: Negligence & Consent	<ul style="list-style-type: none"> <li>• Introduction to Medical Ethics</li> <li>• Define consent and briefly describe its various types</li> <li>• Define and describe medical negligence with examples</li> <li>• Enlist and describe the different types of negligence and precautions against medical negligence</li> <li>• Enlist the duties of a medical practitioner and</li> </ul>	Should know Must know Must know Must know Must know	C1 C2 C2 C2 C2	LGIS	MCQs SAQs VIVA

		patient w.r.t medical negligence.				
M7-FM-F-008	<b>Importance of Courts and legal procedures in Pakistan</b> Medico-legal Importance of Evidence and witness	<ul style="list-style-type: none"> <li>Define law, Statute law, Common law, civil law and criminal law.</li> <li>Define Inquest with examples of its application in medico-legal work.</li> <li>Describe various methods of judicial investigations</li> <li>State Different types of Courts and their power of jurisdiction</li> <li>Enumerate and briefly describe the different types of evidence.</li> <li>Briefly explain the admissibility of evidence in court.</li> <li>Differentiate between dying declaration and dying deposition.</li> <li>Briefly explain the stages of evidence in court.</li> </ul>	Parikh “textbook of medical jurisprudence forensic medicine and toxicology, edition 9  <a href="https://www.allresearchjournal.com/archives/2015/vol1issue9/PartO/1-9-123-213.pdf">https://www.allresearchjournal.com/archives/2015/vol1issue9/PartO/1-9-123-213.pdf</a>			MCQs
M7-FM-F-012	<b>Medicolegal Certificates</b> (Age estimation, Examination of Injuries, Rape survivors, death certificate, Consent form)	<ul style="list-style-type: none"> <li>Briefly describe Importance of Medicolegal Certificates.</li> <li>Enlist various types of medicolegal certificates.</li> <li>Enlist various types of medico-legal certificates</li> <li>Fill different types of Medico-legal Certificates</li> <li>Recognize the need and make different types of medico-legal certificates when required</li> </ul>	C2  C2 P P-2  A-2	Must know  Must know Must know Must know	SKILL	OSPE
<b>CLINICAL SCIENCES</b>						
<b>MEDICINE</b>						
MI-FM-VI(M)-001	<b>Medicine in Practice</b>	<ul style="list-style-type: none"> <li>Recognize importance of clinical medicine and context for theoretical learning so that one can see how learning about body system and social sciences are applied to care of patient.</li> </ul>	C3	Must know	LGIS	MCQs SAQs

		<ul style="list-style-type: none"> <li>Recognize importance of clinical decision making.</li> </ul>	C3	Must know		
		<ul style="list-style-type: none"> <li>Explain clinical reasoning and clinical skills.</li> </ul>	C2	Nice to know		
		<ul style="list-style-type: none"> <li>Understands problems with diagnostic errors.</li> </ul>	C3	Nice to know		
		<ul style="list-style-type: none"> <li>Explain the use and interpretation of diagnostic tests.</li> </ul>	C2	Nice to Know		
		<ul style="list-style-type: none"> <li>Analysis of patient- physician relationship.</li> </ul>	C4	Nice to Know		
		<ul style="list-style-type: none"> <li>Explain evidence-based medicine.</li> </ul>	C2	Nice to Know		
		<ul style="list-style-type: none"> <li>Explain expanding role of physician</li> </ul>	C2	Nice to Know		
MI-FM-VI(M)-002	Medical ethics introduction	<ul style="list-style-type: none"> <li>Recognize and evaluate different ethical problems including gap block, priority setting, moral dilemma and resolving conflict.</li> </ul>	C1	Nice to Know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>Analysis different ethical problems and knows different approaches.</li> </ul>	C4	Nice to Know		
		<ul style="list-style-type: none"> <li>Recognize importance of informed consent before examining a patient or any procedure.</li> </ul>	C1	Nice to Know		
		<ul style="list-style-type: none"> <li>Recognize importance of counseling of patients and attendants in different clinical settings.</li> </ul>	C1	Nice to Know		
		<ul style="list-style-type: none"> <li>Recognize respect for patient autonomy and acting in best interest of patient and maintaining confidentiality.</li> </ul>	C1	Nice to Know		
<b>SURGERY</b>						
MI-FM-VI(S)-001	<b>Surgical ethics</b>	<ul style="list-style-type: none"> <li>Establish importance of ethics in operating room</li> </ul>	C3	Nice to Know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>Establish common ethical issues in operating room (Exposure of body, Dress,</li> </ul>	C3			

		People gathering and traffic, Noise, Comments and behavior, Honesty, Consent.)				
I-FM-VI(S)-002	<b>Patient safety &amp; quality improvement</b>	<ul style="list-style-type: none"> <li>Discuss the importance of understanding human behavior if patient care is to improve.</li> </ul>	C2	Nice to Know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>Describe the importance of patient safety and the scale of the problem.</li> </ul>	C2			
		<ul style="list-style-type: none"> <li>Explain medical error and its definitions including adverse events and near misses.</li> </ul>	C2			
		<ul style="list-style-type: none"> <li>Discuss patient safety strategies and solutions.</li> </ul>	C3			
		<ul style="list-style-type: none"> <li>Discuss the importance of understanding human behavior if patient care is to improve</li> </ul>	C2			
<b>SPIRAL COURSES</b>						
<b>BEHAVIORAL SCIENCES</b>						
M1-FM-SI(BS)-001	Psychosocial Assessment	<ul style="list-style-type: none"> <li>To do a detailed interview keeping in mind the psychological and social aspects of illness.</li> <li>To be inquire about the illness's predisposing, precipitating and maintaining factors.</li> <li>To do detailed mental state examination including thought process and cognitive functions.</li> <li>To incorporate the bio-psychosocial model of healthcare in the management of the patient.</li> </ul>	C3	Must know  Must know Must know  Must know	LGIS	MCQs SEQs SAQs Standard matching
<b>Integrated Undergraduate Research Curriculum (IUGRC)</b>						
	<b>Inferential Statistics 1 Introduction</b>	<ul style="list-style-type: none"> <li>Define inferential statistics</li> </ul>	C1	Must know	LGIS	MCQs
		<ul style="list-style-type: none"> <li>Explain role of inferential statistics in health research decision making</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Describe concept of generalization of results to the population</li> </ul>	C2	Must know		

M1-FM-SI(IUGRC)-001	<ul style="list-style-type: none"> <li>Explain concept of standard error and confidence interval</li> </ul>	C2	Must know		
	<ul style="list-style-type: none"> <li>Calculate confidence interval and its interpretation.</li> </ul>	C3	Must know		
	<ul style="list-style-type: none"> <li>Appreciate the Concepts of degree of freedom</li> </ul>	C1	Nice to Know		
	<ul style="list-style-type: none"> <li>Calculate the degree of freedom in different tests of significance.</li> </ul>	C3	Nice to Know		
	<ul style="list-style-type: none"> <li>Enable to interpret the Probability distribution chart</li> </ul>	C3	Nice to Know		
	<ul style="list-style-type: none"> <li>Illustrate sources of type I &amp; type II errors</li> </ul>	C2	Nice to Know		

### Syllabus Learning Management System (LMS)

Schedule Wks	Topics of LGIS &SGD*	Topics Of SDL	Learning Objectives of SDL	Learning resources	Mode of assessment
<b>PHARMACOLOGY</b>					
Wk. 1	Absorption of drugs Distribution of drugs Biotransformation Bioavailability Half life of drugs Excretion of drugs	Drug development and new therapeutic approaches	<ul style="list-style-type: none"> <li>Define drug</li> <li>Identify sources of drug</li> <li>Discuss the phases of drug development</li> <li>Outline the new therapeutic approaches</li> </ul>	<ul style="list-style-type: none"> <li>Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition Chapter 1, Page 11-18</li> <li>Goodman and Gillmans The Pharmacological basics of Therapeutics, 14th Edition, Chapter 1, Pg 1-20</li> <li>Domingo-Fernández D, Gadiya Y, Preto AJ, Krettler CA, Mubeen S, Allen A, Healey D, Colluru V. Natural products have increased rates of clinical trial success throughout the drug development process. Journal of Natural Products. 2024 Jul 6;87(7):1844-51.</li> <li>Sun D, Gao W, Hu H, Zhou S. Why 90% of</li> </ul>	LMS Based MCQS

				<p>clinical drug development fails and how to improve it?. Acta Pharmaceutica Sinica B. 2022 Jul 1;12(7):3049-62.</p> <p><a href="https://www.youtube.com/watch?v=kQ18rDhhyk">https://www.youtube.com/watch?v=kQ18rDhhyk</a> o</p>	
<b>PATHOLOGY</b>					
	<ul style="list-style-type: none"> <li>• Reversible and irreversible cell injury</li> <li>• Cellular adaptation</li> <li>• Cellular aging &amp; intracellular accumulations</li> </ul>	<p>The genome and cellular house keeping</p>	<ul style="list-style-type: none"> <li>• Describe the components and regulators of gene function</li> <li>• Describe the functions of coding and non-coding genome</li> <li>• Describe the components of cell and regulation of cell function</li> </ul>	<ul style="list-style-type: none"> <li>• Robbins &amp; Cotran Pathologic Basis OF Disease 10<sup>th</sup> Edition , Chapter 1 Pg 1—15</li> <li>• Ketelut-Carneiro N, Fitzgerald KA. Apoptosis, Pyroptosis, and Necroptosis-Oh My! The Many Ways a Cell Can Die. J Mol Biol. 2022 Feb 28;434(4):167378. doi: 10.1016/j.jmb.2021.167378. Epub 2021 Nov 25. PMID: 34838807.</li> </ul>	<p>LMS Based MCQS</p>
<b>FORENSIC MEDICINE</b>					
	<p><b>Introduction to Forensic Medicine</b>  <b>Legal Aspects of Medical practice-I</b>  <b>Legal Aspects of Medical practice-II</b>  <b>Legal Aspects of Medical Praticce -III</b>  <b>Medicolegal Certificates for</b>                  ( Age estimation, Examination of Injuries, Rape survivors, death certificate, Consent form)</p>	<p><b>Importance of Courts and legal procedures in Pakistan</b>                  Medico-legal                  Importance of Evidence and witness</p>	<ul style="list-style-type: none"> <li>• Define law, Statute law, Common law, civil law and criminal law.</li> <li>• Define Inquest with examples of its application in medico-legal work.</li> <li>• Describe various methods of judicial investigations</li> <li>• State Different types of Courts and their power of jurisdiction</li> <li>• Enumerate and briefly describe the different types of evidence.</li> </ul>	<p>Parikh “textbook of medical jurisprudence forensic medicine and toxicology, edition 9</p> <ul style="list-style-type: none"> <li>• <a href="https://www.allresearchjournal.com/archives/2015/vol1issue9/PartO/1-9-123-213.pdf">https://www.allresearchjournal.com/archives/2015/vol1issue9/PartO/1-9-123-213.pdf</a></li> </ul>	<p>LMS Based MCQS</p>

			<ul style="list-style-type: none"> <li>Briefly explain the admissibility of evidence in court.</li> <li>Differentiate between dying declaration and dying deposition.</li> <li>Briefly explain the stages of evidence in court.</li> </ul>		
<b>BEHAVIORAL SCIENCES</b>					
	<b>Psychosocial Assessment</b>	Psychological Peculiarities of dentistry	<ul style="list-style-type: none"> <li>Understand the psychological factors influencing patient behavior and dental care outcomes.</li> <li>Develop skills in communication and rapport-building to address patient anxiety and dental phobia.</li> <li>Implement strategies for patient education and behavioral modification to enhance oral health outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>Behavioral Sciences textbook, second edition By Mowadat Rana</li> <li>Nocini et al. Bilateral reconstruction of the mandibular body with symphyseal preservation using a single fibula free flap: operative technique Journal of Otolaryngology - Head &amp; Neck Surgery (2022) 51:29 <a href="https://journalotolohns.biomedcentral.com/articles/10.1186/s40463-022-00579-5">https://journalotolohns.biomedcentral.com/articles/10.1186/s40463-022-00579-5</a></li> </ul>	LMS Based MCQS
		Role of psychology in ETIOLOGY, precipitation of illness and its management	<ul style="list-style-type: none"> <li>Recognize the influence of psychological factors in the development and progression of various medical conditions.</li> <li>Identify strategies for psychological assessment, intervention, and collaborative care in managing illnesses with psychological components</li> </ul>	<ul style="list-style-type: none"> <li>Behavioral Sciences textbook, second edition By Mowadat Rana</li> <li>Kelly MJ, et al. Spectrum of impulse control behaviours in Parkinson’s disease: pathophysiology and management. J Neurol Neurosurg Psychiatry 2020;91:703–711. doi: 10.1136/jnnp-2019-322453 703</li> </ul>	LMS Based MCQS

**Transdisciplinary Clinical Reasoning Forum (Hardens Level 11) Sessions for 1<sup>st</sup> Week**

Session	Topic	Department	At the End of Session Student Should Be Able To	Learning Domain	Assessment Tool
TCRF Sessions -I	A Case of Drug Intake, Patient Safety and Medico-Legal Responsibilities	Pharmacology	Analyze the effects of unknown drug ingestion, dose, and route on central nervous system depression and patient safety.	C4	MCQ
		Pathology	Explain the early cellular and tissue responses to hypoxia caused by hypoventilation, distinguishing reversible from irreversible injury.	C4	MCQ
		Behavioral Sciences	Apply ethical principles of implied consent, confidentiality, and appropriate disclosure while communicating with family during emergency care.	C4	OSCE
		Forensic Medicine	Identify an unconscious patient with suspected drug overdose as a medico-legal case and demonstrate principles of documentation and evidence preservation.	C3	MCQ
		Medicine	Perform systematic clinical assessment and monitoring of an unconscious patient using vital signs and basic investigations to ensure patient safety.	C4	OSCE EPA
		Surgery	Demonstrate timely airway protection and ventilatory support decision-making in a deteriorating unconscious patient.	C4	OSCE EPA
		Community Medicine	Recognize substance misuse among young adults and outline community-based preventive strategies to reduce unsafe drug use.	C3	MCQ

**THEME 2: RATIONAL DRUG USE IN INFLAMMATION, INFECTION AND TISSUE INJURY**  
**WEEK 2 and 3**

<b>WEEK</b>	<b>RATIONALE</b>	<b>GENERAL LEARNING OBJECTIVES</b>
<p><b>2,3</b></p>	<p>In clinical practice, a drug is not a static chemical, and a patient is not a static vessel. The presence of inflammation, whether from a surgical site infection, sepsis, or chronic disease—radically reconfigures the body’s chemistry. This theme integrates Pathology, Pharmacology, Medicine and Surgery to prepare the student for effective and responsible patient care.</p> <p>Inflammation and infection represent some of the most common clinical problems encountered in medical practice. These conditions profoundly influence drug disposition and response and subsequently therapeutic outcomes. The multidisciplinary approach of the theme fosters rational drug use, dose individualization and evidence-based practice.</p>	<p>By the end of this theme, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the fundamental principles of pharmacokinetics including absorption, distribution, metabolism, and excretion (ADME)</li> <li>2. Explain key pharmacokinetic parameters such as bioavailability, volume of distribution, clearance, and half-life.</li> <li>3. Identify factors affecting drug kinetics, including tissue perfusion, inflammation, and organ dysfunction.</li> <li>4. Apply pharmacokinetics to drug calculations in clinical scenarios</li> <li>5. Outline the concept of therapeutic drug monitoring and its clinical relevance.</li> <li>6. Predict alterations in drug absorption in clinical conditions associated with inflammation such as shock, edema, postoperative ileus, and poor tissue perfusion.</li> <li>7. Define inflammation and differentiate between acute and chronic inflammation based on etiology, duration, cellular infiltrate, and outcomes.</li> <li>8. Explain the process of wound healing and tissue regeneration and abnormalities in these processes.</li> <li>9. Describe physiological and metabolic response to injury and infection</li> <li>10. Classify surgical infections including superficial incisional, deep incisional, and organ/space infections and outline its management</li> </ol>

**Case based discussion for Transdisciplinary Clinical Reasoning Forum**

**Case 2: “When Inflammation Alters the Dose: Infection, Organ Dysfunction, and Rational Drug Use”**

A 58-year-old male presents to the emergency department with high-grade fever, abdominal pain, and vomiting for the last 3 days. He belongs to a low-socioeconomic background and initially self-medicated with over-the-counter analgesics and oral antibiotics obtained without prescription. Due to worsening pain and inability to tolerate oral intake, he was brought to the hospital by family members. There is a history of poor oral intake and reduced urine output over the last 24 hours. He has no documented drug allergies. Past medical history reveals poorly controlled hypertension. On further evaluation, the patient is diagnosed with acute appendicitis complicated by perforation and intra-abdominal infection and is planned for emergency surgery.

**Clinical Examination**

- Temperature: 39.6°C
- Blood Pressure: 90/60 mmHg
- Pulse: 118/min
- Respiratory Rate: 24/min
- Generalized abdominal tenderness with guarding
- Peripheral edema present


**Laboratory & Initial Investigations**

- Total Leukocyte Count: 18,500/μL (Neutrophilia)
- CRP: Markedly raised
- Serum Albumin: 2.4 g/dL
- Serum Creatinine: 2.1 mg/dL
- Arterial Blood Gas: Metabolic acidosis with raised lactate
- Ultrasound Abdomen: Perforated appendix with localized abscess

**Educational Relevance to Theme**

- Impact of acute inflammation and infection on drug pharmacokinetics
- Altered drug absorption in shock and postoperative ileus
- Effect of hypoalbuminemia on protein binding and free drug concentration
- Cytokine-mediated changes in hepatic drug metabolism
- Renal dysfunction and need for dose adjustment
- Patient safety in dynamically changing inflammatory states

**Case 1: “When Inflammation Alters the Dose: Infection, Organ Dysfunction, and Rational Drug Use”**



58-year-old male with fever, abdominal pain, and sepsis due to perforated appendix.

**Clinical Examination**

- Temperature: 39°C
- BP: 90/60 mmHg
- Pulse: 118/min
- Abdomen: Tender with guarding

Initial Investigations	Initial Investigations
• WBC: 18,500/μL	• WBC: 18,500/μL
• Albumin: 2.4 g/dL	• Albumin: 2.4 g/dL
• Creatinine: 2.1 mg/dL	• Creatinine: 2.1 mg/dL
	• USG: Perforated appendix with abscess

**INFLAMMATION, INFECTION, AND DRUG KINETICS: Bridging Pathology and Pharmacotherapy**

Impact of inflammation and organ dysfunction on drug absorption, distribution, *metabolism*, and elimination.

**Disciplines Involved**

<p><b>Pharmacology</b></p> <ul style="list-style-type: none"> <li>• “ADME” changes in inflammation</li> <li>• Dose adjustment &amp; TDM in sepsis</li> </ul>	<p><b>Pathology</b></p> <ul style="list-style-type: none"> <li>• Inflammatory mediators</li> <li>• SIRS &amp; sepsis</li> </ul>	<p><b>Medicine</b></p> <ul style="list-style-type: none"> <li>• Sepsis &amp; organ dysfunction</li> <li>• Monitoring labs &amp; drug effects</li> </ul>	<p><b>Surgery</b></p> <ul style="list-style-type: none"> <li>• Surgical site infections</li> <li>• Source control &amp; abscess</li> </ul>
<p><b>Behavioral Sciences &amp; Ethics</b></p> <ul style="list-style-type: none"> <li>• Self-medication &amp; antibiotic misuse</li> <li>• Patient communication</li> </ul>	<p><b>Community Medicine</b></p> <ul style="list-style-type: none"> <li>• Delayed care &amp; antibiotic resistance</li> <li>• Public health education</li> </ul>		

**Key Message**

“Safe prescribing in inflamed patients requires constant re-evaluation of dose, response, and risk.”

**Disciplines Involved:****Pharmacology**

Explanation of how inflammation and organ dysfunction alter ADME of drugs and application principles of dose adjustment and pharmacokinetics in sepsis.

**Pathology**

To describe the role of inflammatory mediators in infection and correlate cellular injury with laboratory abnormalities.

**Forensic Medicine**

Informed consent

**Medicine**

Assessment and monitoring of a patient with intra-abdominal infection

**Surgery**

Peri-operative risk assessment with infection control and organ dysfunction in planning emergency surgical intervention

**Behavioral Sciences & Ethics**

Identification of risks of self-medication and antibiotic misuse and demonstration of effective patient communication in critical illness.

**Community Medicine**

Identify social determinants and community-based preventive strategies to reduce inappropriate self-medication and antibiotic misuse.

**How This Case Fits the Theme**

This case demonstrates how acute inflammation and infection profoundly modifies drug handling in the body, converting standard drug doses into potential causes of toxicity or treatment failure. It emphasizes the need to integrate pathological mechanisms, clinical assessment, pharmacokinetic principles, and safe prescribing practices in patients with severe infection and organ dysfunction.

## SPECIFIC LEARNING OBJECTIVES

### Horizontally Integrated Basic Sciences (Pharmacology, Pathology & Forensic Medicine)

(Knowledge)

#### Pharmacology Large Group Interactive Session (LGIS)

Code	Topic	Learning Objectives	Learning Domain	Calgary Gauge	Teaching Strategy	Assessment
<b>PHARMACOLOGY</b>						
M1-FM-PH-002	<b>Distribution of drugs-I</b>	<ul style="list-style-type: none"> <li>Define drug distribution</li> </ul>	C1	Must Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Describe the distribution of a drug through various body compartments</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Define volume of distribution</li> </ul>	C1	Must Know		
		<ul style="list-style-type: none"> <li>Express volume of distribution mathematically</li> </ul>	C1	Must Know		
		<ul style="list-style-type: none"> <li>Calculate the volume of distribution of given drug</li> </ul>	P-1	Must Know		
M1-FM-PH-003	<b>Distribution of drugs-II</b>	<ul style="list-style-type: none"> <li>Discuss the characteristics of plasma protein binding &amp; their clinical significance.</li> </ul>	C2	Must Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Describe relationship among volume of distribution &amp; PPB.</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Discuss the drug reservoirs in the body.</li> </ul>	C2	Should Know		
		<ul style="list-style-type: none"> <li>Discuss different factors affecting distribution of drugs</li> </ul>	C2	Should Know		
M1-FM-PH-004	<b>Biotransformation of drugs-I</b>	<ul style="list-style-type: none"> <li>Define Biotransformation</li> </ul>	C1	Must Know	LGIS	
		<ul style="list-style-type: none"> <li>Describe the outcomes and clinical significance of</li> </ul>	C2	Must Know		

		Biotransformation				MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Enlist types of biotransformation (microsomal and non-microsomal)</li> </ul>	C1	Must Know		
		<ul style="list-style-type: none"> <li>Describe characteristics of Phase 1 and Phase 2 biotransformation reactions</li> </ul>	C2	Should Know		
M1-FM-PH-005	<b>Biotransformation of drugs-II</b>	<ul style="list-style-type: none"> <li>Discuss different factors affecting biotransformation</li> </ul>	C2	Should Know	LGIS	MCQ SAQ/SEQ VIVA
		Discuss enzyme induction and inhibition	C2	Must Know		
M1-FM-PH-006	<b>Bioavailability</b>	<ul style="list-style-type: none"> <li>Define bioavailability</li> </ul>	C1	Must Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Express it mathematically and graphically</li> </ul>	C1	Must Know		
		<ul style="list-style-type: none"> <li>Describe the clinical significance of bioavailability</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Define first pass metabolism</li> </ul>	C1	Must Know		
		<ul style="list-style-type: none"> <li>Recognize the effect of first pass metabolism on bioavailability of drugs</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Discuss the factors affecting bioavailability of drugs</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Differentiate between bioequivalence, therapeutic equivalence &amp; chemical equivalence</li> </ul>	C4	Must Know		
M1-FM-PH-007	<b>Half life</b>	<ul style="list-style-type: none"> <li>Define half-life</li> </ul>	C1	Must Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Express it mathematically</li> </ul>	C1	Must Know		
		<ul style="list-style-type: none"> <li>Discuss phases with graphical representation of half-life (alpha and beta half-life)</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Discuss first and zero order kinetics</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Describe factors affecting half-life.</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Discuss the clinical significance of half-life.</li> </ul>	C2	Must Know		

		<ul style="list-style-type: none"> <li>Discuss steady state concentration and its importance</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Determine the half life of the given drug</li> </ul>	P-1	Should Know		
M1-FM-PH-008	<b>Excretion of drugs</b>	<ul style="list-style-type: none"> <li>Define excretion of drug</li> </ul>	C1	Must Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Identify sites of drug excretion</li> </ul>	C1	Should Know		
		<ul style="list-style-type: none"> <li>Discuss processes involved in drug excretion</li> </ul>	C2	Should Know		
		<ul style="list-style-type: none"> <li>Define drug clearance</li> </ul>	C1	Should Know		
		<ul style="list-style-type: none"> <li>Express it mathematically</li> </ul>	C1	Should Know		
		<ul style="list-style-type: none"> <li>Define extraction ratio</li> </ul>	C1	Should Know		
		<ul style="list-style-type: none"> <li>Describe factors affecting CL</li> </ul>	C2	Should Know		
		<ul style="list-style-type: none"> <li>Outline the significance of clearance</li> </ul>	C2	Should Know		
		M1-FM-PH-020	<b>Role of enzyme induction and inhibition</b>	<ul style="list-style-type: none"> <li>Recall the phenomenon of enzyme induction and inhibition</li> </ul>		
<ul style="list-style-type: none"> <li>Recognize the effect of enzyme induction and enzyme inhibition on co administered drugs</li> </ul>	C2			Must Know		
M1-FM-PH-029	<b>Pharmacogenetics</b>	<ul style="list-style-type: none"> <li>Describe the importance of Pharmacogenetics in this specific case</li> </ul>	C3	Must Know	CBL	MCQ SAQ/SEQ VIVA
M1-FM-PH-022	<b>Pharmacokinetic interactions &amp; Their mechanisms</b>	<ul style="list-style-type: none"> <li>Define drug interactions and its types</li> <li>Classify drug interactions at different pharmacokinetic processes with examples absorption, distribution, metabolism and excretion</li> <li>Discuss clinical implications of these interactions</li> </ul>	<ul style="list-style-type: none"> <li>Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition Chapter 67, Page 1206-1275</li> <li>Peng, Y., Cheng, Z., &amp; Xie, F. (2021). Evaluation of Pharmacokinetic Drug–Drug Interactions: A Review of the Mechanisms, In Vitro and In Silico Approaches. <i>Metabolites</i>, 11(2), 75. <a href="https://doi.org/10.3390/metabo11020075">https://doi.org/10.3390/metabo11020075</a></li> </ul>			LMS based MCQs

			<ul style="list-style-type: none"> <li>• <a href="https://www.youtube.com/watch?v=B7W9leb_hnaE">https://www.youtube.com/watch?v=B7W9leb_hnaE</a></li> </ul>			
M1-FM-PH-024	<b>Role of pharmacogenetics in personalized medicine</b>	<ul style="list-style-type: none"> <li>• Define pharmacogenetics</li> <li>• Describe key genetic factors (e.g., polymorphisms in drug-metabolizing enzymes) that influence drug response.</li> <li>• Discuss the role of single nucleotide polymorphisms (SNPs) in interindividual drug response variability</li> <li>• Evaluate the impact of pharmacogenetics on the treatment of common diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition Chapter 5, Page 77-91</li> <li>• Goodman and Gillmans The Pharmacological basics of Therapeutics, 14th Edition, Chapter 7,132-142</li> <li>• Abad-Santos F, Aliño SF, Borobia AM, García-Martín E, Gassó P, Maroñas O, Agúndez JA. Developments in pharmacogenetics, pharmacogenomics, and personalized medicine. Pharmacological Research. 2024 Feb 1;200:107061.</li> <li>• <a href="https://www.youtube.com/watch?v=6jro2fokOYY">https://www.youtube.com/watch?v=6jro2fokOYY</a></li> </ul>			LMS based MCQs
M1-FM-PH-028	<b>Pharmacological Calculations-II</b>	<ul style="list-style-type: none"> <li>• Clearly define and understand the concepts of fractions and percentages in the context of pharmacological solutions</li> </ul>	C1	Must Know	Skill	OSPE
		<ul style="list-style-type: none"> <li>• Develop proficiency in calculating fractional concentrations for drug solutions, considering both mass/volume and volume/volume ratios.</li> </ul>	P-1	Must Know		
		<ul style="list-style-type: none"> <li>• Calculate percentage concentrations of drug solutions using different weight/volume and volume/volume formulations.</li> </ul>	P-1	Must Know		
M1-FM-PH-025	<b>Biostatistics -I</b>	<ul style="list-style-type: none"> <li>• Explain the concept of central tendency in pharmacology and its relevance in analyzing drug response data.</li> </ul>	C2	Must Know	Skill	OSPE
		<ul style="list-style-type: none"> <li>• Practice calculating the mean, median, and mode</li> </ul>	P-1	Must Know		

		<ul style="list-style-type: none"> <li>Interpret the calculated central tendencies in the context of drug efficacy and safety.</li> </ul>	P-1	Must Know		
<b>PATHOLOGY</b>						
M1-FM-PATH-002	<b>Acute inflammation vascular events</b>	<ul style="list-style-type: none"> <li>Discuss how ischemia-reperfusion injury contributes to cell damage in clinical conditions.</li> </ul>	C2	Nice to know	LGIS	MCQs SAQs VIVA
		<ul style="list-style-type: none"> <li>Describe Stimuli for acute inflammation</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Explain vascular Changes including vascular flow, caliber, and increased vascular permeability. (vascular Leakage)</li> </ul>	C2	Need to know		
		<ul style="list-style-type: none"> <li>Differentiate between transudate and exudate in acute inflammation with clinical examples.</li> </ul>	C2	Need to know		
		<ul style="list-style-type: none"> <li>Discuss the role of endothelial cell activation in vascular changes during inflammation.</li> </ul>	C2	Nice to know		
M1-FM-PATH-003	<b>Cellular Events of Acute Inflammation</b>	<ul style="list-style-type: none"> <li>Describe cellular events (Extravasation and phagocytosis)</li> </ul>	C2	Must know	LGIS	MCQs SAQs VIVA
		<ul style="list-style-type: none"> <li>Describe Leukocytes Adhesions and Transmigration</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Describe Chemotaxis, Leukocyte Activation,</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Phagocytosis and Release of Leukocytes Products</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Describe Leukocyte-Induced Tissue injury and Defects in Leukocytes Function</li> </ul>	C2	Need to know		
		<ul style="list-style-type: none"> <li>Discuss the role of selectins and integrins in leukocyte adhesion and migration, and</li> </ul>	C3	Nice to know		

		their potential as therapeutic targets				
M1-FM-PATH-005	<b>Cellular aging &amp; intracellular accumulations</b>	<ul style="list-style-type: none"> <li>Define the Mechanisms that causes and counteracts cellular aging</li> </ul>	C1	Must know	LGIS	MCQs SAQs VIVA
		<ul style="list-style-type: none"> <li>Discuss the causes of DNA damage</li> </ul>	C2	Need to know		
		<ul style="list-style-type: none"> <li>Describe mechanism of decreased cellular replication</li> </ul>	C2	Need to know		
		<ul style="list-style-type: none"> <li>Explain role of telomers and telomerase and defective protein homeostasis leading to cellular aging</li> </ul>	C2	Need to know		
		<ul style="list-style-type: none"> <li>Define intracellular accumulations</li> </ul>	C1	Must know		
		<ul style="list-style-type: none"> <li>Describe causes, mechanisms and clinical correlations of the following abnormal accumulations in cells and tissues</li> </ul>	C2	Must know		
M1-FM-PATH-006	<b>Chemical Mediators of inflammation</b>	<ul style="list-style-type: none"> <li>Classify Cell Derived Mediators</li> </ul>	C1	Must know	LGIS	MCQs SAQs VIVA
		<ul style="list-style-type: none"> <li>Discuss mechanism of actions of all mediators</li> </ul>	C2	Need to know		
		<ul style="list-style-type: none"> <li>Discuss the therapeutic targeting of specific mediators, such as TNF-<math>\alpha</math> inhibitors in autoimmune diseases (e.g., rheumatoid arthritis)</li> </ul>	C3	Nice to know		
M1-FM-PATH-007	<b>Chronic Inflammation</b>	<ul style="list-style-type: none"> <li>Describe the causes of chronic Inflammation.</li> </ul>	C2	Must know	SGD	MCQs SAQs VIVA
		<ul style="list-style-type: none"> <li>Describe Role of Macrophages</li> </ul>	C2	Must know		
M1-FM-PATH-008	<b>Consequences of inflammation</b>	<ul style="list-style-type: none"> <li>Explain systemic effects of inflammation</li> </ul>	C2	Must know	SGD	MCQs SAQs VIVA
		<ul style="list-style-type: none"> <li>Describe consequences of defective or excessive inflammation</li> </ul>	C2	Nice to know		
M1-FM-PATH-009	<b>Control of normal cell Proliferation and Tissue Growth</b>	<ul style="list-style-type: none"> <li>Explain tissue proliferative activity of Stem cell</li> </ul>	C2	Nice to know	SGD	MCQs SAQs
		<ul style="list-style-type: none"> <li>Explain signaling Mechanism in Cell</li> </ul>	C2	Nice to know		

		Growth				VIVA
		<ul style="list-style-type: none"> <li>Describe cell Cycle and the Regulation of cell Replication</li> </ul>	C2	Must know		
M1-FM-PATH-010	<b>Mechanism of Tissue Regeneration</b>	<ul style="list-style-type: none"> <li>Describe mechanism of tissue regeneration</li> </ul>	C2	Nice to know	SGD	MCQs SAQs VIVA
		<ul style="list-style-type: none"> <li>Define: Collagen, Elastin, Fibrillin, cell adhesion Proteins, Glycosaminoglycans, Proteoglycans</li> </ul>	C1	Nice to know		
		<ul style="list-style-type: none"> <li>Explain molecular pathways in tissue regeneration</li> </ul>	C3	Nice to know		
M1-FM-PATH-020	<b>Granulomatous inflammation</b>	<ul style="list-style-type: none"> <li>Demonstrate the pathogenesis, morphology, etiology, and causes and reasons of granulomatous inflammation</li> </ul>	C2	Must know	CBL	PBQ
		<ul style="list-style-type: none"> <li>Differentiate between different granulomatous diseases</li> </ul>	C4	Must know		
		<ul style="list-style-type: none"> <li>Identify diagnostic criteria for granulomatous inflammation</li> </ul>	P2	Nice to know		
		<ul style="list-style-type: none"> <li>Demonstrate clinical reasoning and problem-solving attitude with collaborative team work</li> </ul>	A3	Nice to know		
M1-FM-PATH-021	<b>Healing by secondary intention</b>	<ul style="list-style-type: none"> <li>Differentiate between repair and regeneration</li> </ul>	C4	Must know	CBL	PBQ
		<ul style="list-style-type: none"> <li>Describe Mechanism of Angiogenesis</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Wound healing by first and second intention</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Describe factors that influence the inflammatory reparative response.</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Describe wound remodeling, formation of granulation tissue and complications</li> </ul>	C2	Must know		

		of wound healing.				
		<ul style="list-style-type: none"> <li>Apply his/her knowledge to identify the mechanism of healing in different circumstances</li> </ul>	A2	Nice to know		
		<ul style="list-style-type: none"> <li>Demonstrate critical thinking attitude needed for application of basic knowledge into clinical situations.</li> </ul>	A3	Nice to know		
M1-FM-PATH-012	<b>Morphological Patterns and complications of Acute inflammation</b>	<ul style="list-style-type: none"> <li>Identify Morphologic Patterns of Acute inflammation</li> <li>Describe the termination events of acute inflammation</li> <li>Describe complications of Acute inflammation</li> </ul>	<ul style="list-style-type: none"> <li>Robbins &amp; Cotran Pathologic Basis OF Disease 10th Edition, Chapter 3 Pg 93—96</li> <li>First Aid for USMLE Step 1: General Pathology – Inflammation</li> <li>First Aid for USMLE Step 1: Immunology – Inflammation</li> </ul>			LMS based MCQs
M1-FM-PATH-016	<b>Fatty change, Calcification, Pigmentation</b>	<ul style="list-style-type: none"> <li>Enlist various conditions which can lead to fatty change calcification and pigmentation</li> </ul>	C1	Must know	SKILL	OSPE
		<ul style="list-style-type: none"> <li>Identify various clinical conditions which lead to fatty change, calcification and pigmentation</li> </ul>	P2	Must know		
		<ul style="list-style-type: none"> <li>Identify the morphology of fatty change, calcification and pigmentation</li> </ul>	P2	Must know		
		<ul style="list-style-type: none"> <li>Demonstrate collaborative working skills</li> </ul>	A2	Must know		
M1-FM-PATH-017	<b>Diagnosis of Acute inflammation</b>	<ul style="list-style-type: none"> <li>Identify acute inflammatory condition on the basis of gross and microscopic findings.</li> </ul>	P2	Must know	SKILL	OSPE
		<ul style="list-style-type: none"> <li>Value the role of basic investigations in clinical management</li> </ul>	A3	Must know		

**FORENSIC MEDICINE**

M7-FM-F-005	<p><b>Legal Aspects of Medical practice-IV</b>                  Medical Ethics:                  Professional misconduct                  PM&amp; DC rules and regulation</p>	<ul style="list-style-type: none"> <li>Define Professional misconduct</li> <li>Briefly describe different types of Abuse that come under professional misconduct.</li> <li>Define Professional secrecy.</li> <li>Define privileged communication and briefly explain its types.</li> <li>Briefly describe different types of medical documentation. (Medical prescription, medical report, medical certificate and medical notification).</li> <li>Briefly describe the structure &amp; function of PMDC</li> </ul>	C1 C2  C2 C2 C2  C2	Must know Should know  Must know Must know  should know  should know	LGIS	MCQs SAQs VIVA
M7-FM-F-013	<p><b>Osteology</b>                  Identification of male and female skull &amp; pelvis</p>	<ul style="list-style-type: none"> <li>Describe the distinguishing features of male and female skull</li> <li>Knowledge of estimation of stature, Race, Age and anatomical details of skull with special reference of MLC/Autopsy</li> <li>Describe the distinguishing features of male and female pelvis</li> <li>Knowledge of estimation of Age and anatomical details of pelvis with special reference of MLC/Autopsy</li> <li>Distinguish male and female skull.</li> <li>Relate anatomical details of skull with reference to personal identity.</li> <li>Distinguish male and female pelvis.</li> <li>Relate anatomical details of pelvis with reference to personal identity.</li> <li>Utilize the basic anatomical details of skull &amp; Pelvis for their Medico-legal utilization</li> </ul>	C2  C2  C2  C2  C2  C2  C2	Must know  Must know  Must know  Must know  Must know  Must know  Must know	SKILL	OSPE
M7-FM-F-014	<p><b>Dactylography</b></p>	<ul style="list-style-type: none"> <li>Briefly describe Poroscopy, Cheiloscopy, Dactylography and Anthropometry.</li> <li>Enlist various types of finger prints</li> </ul>	C1	Must know	SKILL	OSPE

		<ul style="list-style-type: none"> <li>• State medico legal importance of Dactlography Hasse’s Rule</li> <li>• Trace evidence and Locard’s Principle of exchange</li> <li>• Define Poroscopy, Cheiloscopy, Dactylography and Anthropometry.</li> <li>• Enlist and identify various types of fingerprints</li> <li>• Utilize the basic anatomical details of pelvis for its Medicolegal utilization</li> </ul>	<p>C1</p> <p>C2</p> <p>C2</p> <p>C2</p> <p>C2</p> <p>C2</p>	<p>Must know</p> <p>Must know</p> <p>Must know</p>		
M7-FM-F-009	<b>Importance of Medical Ethics Professional Negligence &amp; Consent</b>	<ul style="list-style-type: none"> <li>• Introduction to Medical Ethics</li> <li>• Define consent and briefly describe its various types</li> <li>• Define and describe medical negligence with examples</li> <li>• Enlist and describe the different types of negligence and precautions against medical negligence</li> <li>• Enlist the duties of a medical practitioner and patient w.r.t Medical negligence.</li> </ul>	<p>Parikh “text book of medical jurisprudence forensic medicine and toxicology edition 9</p> <p><a href="https://www.slideshare.net/slideshow/informed-consent-professional-negligence-amp-vicarious-liability/249981885">https://www.slideshare.net/slideshow/informed-consent-professional-negligence-amp-vicarious-liability/249981885</a></p> <p><a href="https://www.sciencedirect.com/science/article/abs/pii/S0263931910002383">https://www.sciencedirect.com/science/article/abs/pii/S0263931910002383</a></p>			LMS based MCQs
M7-FM-F-011	<b>Osteology Odontology</b>	<ul style="list-style-type: none"> <li>• Define ossification centers</li> <li>• Enlist the ossification centers in bones and their appearance with relation to age.</li> <li>• Briefly describe the medicolegal importance of different ages.</li> <li>• Describe the distinguishing features of male and female skull</li> <li>• Knowledge of estimation of stature, Race, Age and anatomical details of skull with special reference of MLC/Autopsy</li> <li>• Describe the distinguishing features of male and female pelvis</li> <li>• Knowledge of estimation of</li> </ul>				LMS based MCQs

		<ul style="list-style-type: none"> <li>Define forensic odontology and determine the age of a person w.r.t teeth.</li> <li>Briefly explain the importance of Gustafson's and Boyd's method.</li> <li>Differentiate between temporary and permanent teeth</li> <li>State the medico-legal importance of teeth.</li> </ul>				
<b>CLINICAL SCIENCES</b>						
<b>MEDICINE</b>						
MI-FM-VI(M)-003	<b>Acute and Chronic Inflammation Medical Perspective</b>	<ul style="list-style-type: none"> <li>Recognize respect for patient autonomy and acting in best interest of patient and maintaining confidentiality.</li> </ul>	C1	Must know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>Recognize mechanism of acute inflammation.</li> </ul>	C1	Must know		
		<ul style="list-style-type: none"> <li>Describe what acute phase response are.</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Explain acute phase proteins.</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Explain mechanism of sepsis and septic shock.</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Differentiate between acute and chronic inflammation.</li> </ul>	C4	Must know		
		<ul style="list-style-type: none"> <li>Recognize the investigations involved in inflammation.</li> </ul>	C1	Must know		
		<ul style="list-style-type: none"> <li>Describe presenting modes of inflammation and problems related to it.</li> </ul>	C2	Must know		
MI-FM-VI(M)-004	<b>Physiological response to infection</b>	<ul style="list-style-type: none"> <li>Recall infectious agents including prions, viruses, prokaryotes and eukaryotes.</li> </ul>	C1	Must know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>Recognize the meaning of normal flora.</li> </ul>	C1	Must know		
MI-FM-VI(M)-005	<b>Common Medical Issue-I</b>	<ul style="list-style-type: none"> <li>Describe patho-physiology of pain.</li> </ul>	C2	Must know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>Describe evaluation of patient with pain.</li> </ul>	C2	Must know		

MI-FM-VI(M)-006	<b>Common Medical Issue-II</b>	<ul style="list-style-type: none"> <li>Evaluate cause of chest discomfort and describe approach to a patient with fever</li> </ul>	C3	Must know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>Differentiate between faintness, syncope, dizziness and vertigo</li> </ul>	C4	Nice to know		
		<ul style="list-style-type: none"> <li>Describe approach to a patient with hypertension.</li> </ul>	C2	Nice to know		
		<ul style="list-style-type: none"> <li>Describe approach to a patient with lymphadenopathy and splenomegaly</li> </ul>	C2	Nice to know		
		<ul style="list-style-type: none"> <li>Evaluate cause of chest discomfort and describe approach to a patient with fever.</li> </ul>	C3	Nice to know		
		<ul style="list-style-type: none"> <li>Differentiate between faintness, syncope, dizziness and vertigo.</li> </ul>	C4	Nice to know		
<b>SURGERY</b>						
MI-FM-VI(S)-003	<b>Sterilization and Disinfection</b>	<ul style="list-style-type: none"> <li>Understand the concept of sterilization and disinfection.</li> </ul>	C2	Must know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>Recognize the importance of aseptic and antiseptic techniques.</li> </ul>	C2	Must know		
MI-FM-VI(S)-004	<b>Surgical Infections</b>	<ul style="list-style-type: none"> <li>The characteristics of the common surgical pathogens and their sensitivities</li> </ul>	C3	Must know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>The classification of sources of infection and their severity.</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>The clinical presentation of surgical infections.</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>The indications for and choice of prophylactic antibiotic.</li> </ul>	C2	Must know		
MI-FM-VI(S)-005	<b>Metabolic response to injury</b>	<ul style="list-style-type: none"> <li>Classical concepts of homeostasis.</li> </ul>	C2	Must know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>Mediators of metabolic response to injury</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Physiological and biochemical changes occur during injury.</li> </ul>	C2	Must know		

		<ul style="list-style-type: none"> <li>• Avoidable factors that enhance metabolic response to injury</li> </ul>	C2	Must know		
MI-FM-VI(S)-006	<b>Wound repair and healing</b>	<ul style="list-style-type: none"> <li>• Normal healing and how it can be adversely affected.</li> </ul>	C2	Must know	LGIS	MCQs SAQs
		<ul style="list-style-type: none"> <li>• Management of wounds of different types.</li> </ul>	C3	Must know		
		<ul style="list-style-type: none"> <li>• Differentiation between acute and chronic wounds</li> </ul>	C3	Must know		
		<ul style="list-style-type: none"> <li>• Differentiate between repair and regeneration</li> </ul>	C4	Must know		
		<ul style="list-style-type: none"> <li>• Normal healing and how it can be adversely affected.</li> </ul>	C2	Must know		
<b>SPIRAL COURSES</b>						
<b>BEHAVIORAL SCIENCES</b>						
M1-FM-SI(BS)-001	<b>Non-Pharmacological Interventions: Communication skill</b>	<ul style="list-style-type: none"> <li>• Understanding importance of effective communication</li> <li>• Verbal and non-verbal techniques to focus on essentials in informational care</li> </ul>	C3		LGIS	MCQs SEQs SAQs Standard matching
M1-FM-SI(BS)-001	<b>Informational Care</b>	<ul style="list-style-type: none"> <li>• To give a comprehensive explanation of seven steps of informational care regarding the three “Ds”</li> <li>• To provide informational care in clinical settings based on the clinical issues</li> </ul>	C3		LGIS	MCQs SEQs SAQs Standard matching
<b>Integrated Undergraduate Research Curriculum (IUGRC)</b>						
	<b>Inferential Statistics 2</b>	<ul style="list-style-type: none"> <li>• Calculate the degree of freedom in different tests of significance.</li> </ul>	C3	Must know	LGIS	

M1-FM-SI(IUGRC)-002	<b>Normal distribution curve</b>	<ul style="list-style-type: none"> <li>Appreciate concept of Normal distribution curve</li> </ul>	C1	Must know		MCQs
		<ul style="list-style-type: none"> <li>Enlist properties of normal distribution curve and application of concept of normal distribution curve to solve community problems</li> </ul>	C3	Must know		
		<ul style="list-style-type: none"> <li>Conceptualize the methods of generalization of result of sample over the population</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Enlists the uses of normal distribution curve</li> </ul>	C1	Must know		
		<ul style="list-style-type: none"> <li>Explain the Deviation from normality (symmetry and spread)</li> </ul>	C2	Must know		
M1-FM-SI(IUGRC)-003	<b>Inferential Statistics 3</b> Hypothesis Testing	<ul style="list-style-type: none"> <li>Elaborate the concept of hypothesis testing</li> </ul>	C2	Must know	LGIS	MCQs
		<ul style="list-style-type: none"> <li>Explain role of statistical test of significance in hypothesis testing</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Enlist the steps of hypothesis testing</li> </ul>	C1	Must know		
		<ul style="list-style-type: none"> <li>Appreciate the concept of Level of significance (<math>\alpha</math>)</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Interpret p-value in published research results</li> </ul>	C3	Must know		
		<ul style="list-style-type: none"> <li>Enable to interpret the Probability distribution chart</li> </ul>	C3	Must know		

### SYLLABUS FOR LEARNING MANAGEMENT SYSTEM (LMS)

Schedule Wks	Topics of LGIS &SGD*	Topics Of SDL	Learning Objectives of SDL	Learning resources	Mode of assessment
<b>PHARMACOLOGY</b>					
Wk.2 & 3	Factors affecting absorption of drugs Pharmacokinetics Parameters	Pharmacokinetic interactions & Their mechanisms	<ul style="list-style-type: none"> <li>• Drug interactions at different pharmacokinetic processes with examples absorption, distribution, metabolism and excretion</li> <li>• Discuss clinical implications of these interactions</li> </ul>	<ul style="list-style-type: none"> <li>• Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition Chapter 67, Page 1206-1275</li> <li>• Peng, Y., Cheng, Z., &amp; Xie, F. (2021). Evaluation of Pharmacokinetic Drug–Drug Interactions: A Review of the Mechanisms, In Vitro and In Silico Approaches. <i>Metabolites</i>, 11(2), 75. <a href="https://doi.org/10.3390/metabo11020075">https://doi.org/10.3390/metabo11020075</a></li> <li>• <a href="https://www.youtube.com/watch?v=B7W9lebhnaE">https://www.youtube.com/watch?v=B7W9lebhnaE</a></li> </ul>	LMS Based MCQS
		<b>Role of pharmacogenetics in personalized medicine</b>	<ul style="list-style-type: none"> <li>• Define pharmacogenetics</li> <li>• Describe key genetic factors (e.g., polymorphisms in drug-metabolizing enzymes) that influence drug response.</li> <li>• Discuss the role of single nucleotide polymorphisms (SNPs) in interindividual drug response variability</li> <li>• Evaluate the impact of pharmacogenetics on the treatment of common diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition Chapter 5, Page 77-91</li> <li>• Goodman and Gillmans The Pharmacological basics of Therapeutics, 14th Edition, Chapter 7,132-142</li> <li>• Abad-Santos F, Aliño SF, Borobia AM, García-Martín E, Gassó P, Maroñas O, Agúndez JA. Developments in pharmacogenetics, pharmacogenomics, and personalized medicine. <i>Pharmacological Research</i>. 2024 Feb 1;200:107061.</li> <li>• <a href="https://www.youtube.com/watch?v=6jro2f">https://www.youtube.com/watch?v=6jro2f</a></li> </ul>	LMS based MCQs

PATHOLOGY					
	<ul style="list-style-type: none"> <li>Acute inflammation vascular events</li> <li>Cellular Events of Acute Inflammation</li> <li>Chemical Mediators of inflammation</li> </ul>	Cell Growth	<ul style="list-style-type: none"> <li>Describe the cell signaling pathways</li> <li>Describe the cell cycle and its regulators</li> <li>Describe the role of growth factors and their receptors in cell growth</li> <li>Describe the role of extracellular matrix in cell growth</li> <li>Describe the role of stem cells in replenishing cellular populations</li> </ul>	<ul style="list-style-type: none"> <li>Robbins &amp; COTRAN Pathologic Basis OF Disease 10th Edition, Chapter 1 Pg 15—29</li> <li>First Aid for USMLE Step 1: Immunology – Inflammation</li> </ul>	LMS Based MCQS
	<ul style="list-style-type: none"> <li>Morphologic patterns of acute inflammation</li> <li>Control of normal cell proliferation and tissue growth</li> <li>Mechanism of tissue regeneration</li> <li>Healing by secondary intention</li> </ul>	Morphological Patterns and complications of Acute inflammation	<ul style="list-style-type: none"> <li>Identify Morphologic Patterns of Acute inflammation</li> <li>Describe the termination events of acute inflammation</li> <li>Describe complications of Acute inflammation</li> </ul>	<ul style="list-style-type: none"> <li>Robbins &amp; Cotran Pathologic Basis OF Disease 10th Edition, Chapter 3 Pg 93—96</li> <li>First Aid for USMLE Step 1: General Pathology – Inflammation</li> <li>First Aid for USMLE Step 1: Immunology – Inflammation</li> </ul>	LMS Based MCQS
FORENSIC MEDICINE					
		Importance of Medical Ethics Professional Negligence & Consent	<ul style="list-style-type: none"> <li>Introduction to Medical Ethics</li> <li>Define consent and briefly describe its various types</li> <li>Define and describe medical negligence with examples</li> <li>Enlist and describe the different types of negligence and precautions against medical negligence</li> <li>Enlist the duties of a medical practitioner and patient w.r.t Medical negligence.</li> </ul>	Parikh “text book of medical jurisprudence forensic medicine and toxicology edition 9 <a href="https://www.slideshare.net/slideshow/informed-consent-professional-negligence-amp-vicarious-liability/249981885">https://www.slideshare.net/slideshow/informed-consent-professional-negligence-amp-vicarious-liability/249981885</a>  <a href="https://www.sciencedirect.com/science/article/abs/pii/S0263931910002383">https://www.sciencedirect.com/science/article/abs/pii/S0263931910002383</a>	LMS Based MCQS

				•	
	Legal Aspects of Medical Practice -IV	Osteology Odontology	<ul style="list-style-type: none"> <li>• Define ossification centers</li> <li>• Enlist the ossification centers in bones and their appearance with relation to age.</li> <li>• Briefly describe the medicolegal importance of different ages.</li> <li>• Describe the distinguishing features of male and female skull</li> <li>• Knowledge of estimation of stature, Race, Age and anatomical details of skull with special reference of MLC/Autopsy</li> <li>• Describe the distinguishing features of male and female pelvis</li> <li>• Knowledge of estimation of</li> <li>• Define forensic odontology and determine the age of a person w.r.t teeth.</li> <li>• Briefly explain the importance of Gustafson's and Boyd's method.</li> <li>• Differentiate between temporary and permanent teeth</li> <li>• State the medico-legal importance of teeth.</li> </ul>	Parikh "text book of medical jurisprudence forensic medicine and toxicology edition 9	LMS Based MCQS
<b>BEHAVIORAL SCIENCES</b>					
	Non-Pharmacological Interventions: Communication skill	Role of psychological factors in diseases causing disability, handicap and stigma	<ul style="list-style-type: none"> <li>• Understand how psychological factors contribute to the development and management of disabilities, handicaps, and stigma in individuals with various health conditions.</li> <li>• Explore the impact of societal attitudes and beliefs on the psychological well-being of individuals affected by diseases</li> </ul>	Behavioral Sciences textbook, second edition Mowadat Rana <ul style="list-style-type: none"> <li>• E. van Beukering, In What Ways Does Health Related Stigma Affect Sustainable Employment and Well-Being at Work? A Systematic Review</li> <li>• Journal of Occupational Rehabilitation (2022) 32:365–379 <a href="https://link.springer.com/article/10.1007/s10926-021-09998-z">https://link.springer.com/article/10.1007/s10926-021-09998-z</a></li> </ul>	LMS Based MCQS

			<p>causing disability, handicaps, and stigma.</p> <ul style="list-style-type: none"> <li>• Identify effective coping mechanisms and psychosocial interventions aimed at addressing the psychological needs of individuals living with disabilities, handicaps, and stigma.</li> </ul>		
	Informational care	Role of psychological factors and medically unexplained symptoms.	<ul style="list-style-type: none"> <li>• Recognize the role of psychological factors in the manifestation and management of medically unexplained symptoms.</li> <li>• Develop skills in conducting thorough psychosocial assessments and implementing biopsychosocial interventions for patients with somatic complaints.</li> </ul>	<ul style="list-style-type: none"> <li>• Behavioral Sciences textbook, second edition by Mowadat Rana</li> <li>• Bernd Löwe et al., Persistent Somatic symptoms ACROSS diseases — from risk factors to modification: scientific framework and overarching protocol of the interdisciplinary SOMACROSS research unit. <i>BMJ Open</i> 2022;12:e057596. doi:<a href="https://doi.org/10.1136/bmjopen-2021-057596">10.1136/bmjopen-2021-057596</a></li> </ul>	

**Transdisciplinary Clinical Reasoning Forum (Hardens Level 11) Sessions for 3<sup>rd</sup> Week**

<b>Session</b>	<b>Topic</b>	<b>Department</b>	<b>At the End of Session Student Should Be Able To</b>	<b>Learning Domain</b>	<b>Assessment Tool</b>
TCRF-2	When Inflammation Alters the Dose: Infection, Organ Dysfunction, and Rational Drug	Pharmacology	Apply principles of rational drug selection and dose adjustment in the presence of infection, dehydration, and evolving renal dysfunction.	C4	MCQ PBQ
		Pathology	Correlate systemic inflammation and sepsis with reversible and irreversible cellular and organ injury.	C3	MCQ
		Forensic Medicine	Identify the principles of medical practice in various clinical scenarios.	C4	MCQ
		Medicine	Assess and monitor a critically ill patient with intra-abdominal infection for sepsis, acute kidney injury, and hemodynamic instability.	C5	OSCE
		Surgery	Integrate peri-operative risk assessment with infection control and organ dysfunction in planning emergency surgical intervention	C5	OSCE
		Community Medicine	Identify social determinants and community-based preventive strategies to reduce inappropriate self-medication and antibiotic misuse.	C3	MCQ
		Behavioral Sciences	Identification of risks of self-medication and antibiotic misuse and demonstration of effective patient communication in critical illness.	C3	OSCE

<b>THEME 3: FROM DRUG RECEPTOR INTERACTION TO THERAPEUTIC RESPONSE</b>		
<b>WEEK 4</b>		
<b>WEEK</b>	<b>RATIONALE</b>	<b>GENERAL LEARNING OBJECTIVES</b>
<b>4</b>	<p>Modern medicine exists at the intersection of biological predictability and individual variability. For a physician to practice safely, they must understand not only how a drug is <i>supposed</i> to work (Pharmacodynamics), but also why it <i>actually</i> works differently in certain patients due to genetics, inflammation, or chance (Statistics), and the legal consequences of these variations (Forensic Medicine).</p>	<p>By the end of this theme, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the mechanisms of drug action and their relationship to dose–response characteristics.</li> <li>2. Analyze factors influencing drug response, including patient variability and disease states</li> <li>3. Interpret dose–response curves to predict therapeutic efficacy and safety.</li> <li>4. Identify and evaluate adverse drug reactions and their clinical significance.</li> <li>5. Apply basic biostatistical principles and hypothesis testing in interpreting pharmacological and clinical data.</li> <li>6. Apply pathological criteria to diagnose acute versus chronic inflammatory conditions relevant to clinical practice.</li> <li>7. Describe methods of personal identification, including physical characteristics, fingerprints, DNA profiling, and scars.</li> <li>8. Apply principles of forensic odontology in age estimation and identification.</li> </ol>

## SPECIFIC LEARNING OBJECTIVES

### Horizontally Integrated Basic Sciences (Pharmacology, Pathology & Forensic Medicine)

Code	Topic	Learning Objectives	Learning Domain	Calgary Gauge	Teaching Strategy	Assessment
<b>PHARMACOLOGY</b>						
M1-FM-PH-009	<b>Mechanism of drug action-I</b>	<ul style="list-style-type: none"> <li>Discuss different ways of drug interactions</li> <li>Chemical &amp; physical interaction</li> <li>Drug –Receptor interaction</li> </ul>	C2	Must Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Define receptor, its types and distribution</li> </ul>	C1	Must Know		
		<ul style="list-style-type: none"> <li>Define ligand</li> </ul>	C1	Must Know		
		<ul style="list-style-type: none"> <li>Discuss different receptor ligand interaction (agonist, partial agonist, inverse agonist and antagonist)</li> </ul>	C2	Must Know		
M1-FM-PH-010	<b>Mechanism of drug action-II</b>	<ul style="list-style-type: none"> <li>Discuss different receptor signal transduction mechanisms</li> </ul>	C2	Must Know	LGIS	MCQ SAQ/SEQ VIVA
M1-FM-PH-011	<b>Dose-response curve-I</b>	<ul style="list-style-type: none"> <li>Define Dose response curve</li> </ul>	C1	Must Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Discuss different types of dose response curve</li> </ul>	C2	Should Know		
		<ul style="list-style-type: none"> <li>Describe the information that can be obtained from a Graded Dose Response Curve with its clinical significance</li> </ul>	C2	Should Know		
M1-FM-PH-012		<ul style="list-style-type: none"> <li>Explain Quantal Dose Response Curve</li> </ul>	C2	Should Know		

	<b>Dose-response curve-II</b>	<ul style="list-style-type: none"> <li>Describe the information that can be obtained from a Quantal Dose Response Curve</li> </ul>	C2	Should Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Describe differences between Graded and Quantal Dose Response Curve</li> </ul>	C2	Should Know		
		<ul style="list-style-type: none"> <li>Value the role of these basic investigations in clinical management</li> </ul>	A3	Nice to know		
M1-FM-PH-013	<b>Drug adaptation mechanisms</b>	<ul style="list-style-type: none"> <li>Define Tolerance &amp; Tachyphylaxis with clinical examples</li> </ul>	C2	Must Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Differentiate between Tolerance and Tachyphylaxis</li> </ul>	C2	Must Know		
		<ul style="list-style-type: none"> <li>Discuss different types and mechanisms of drug tolerance</li> </ul>	C2	Should Know		
		<ul style="list-style-type: none"> <li>Define drug dependence</li> </ul>	C1	Should Know		
		<ul style="list-style-type: none"> <li>Discuss the stages of drug dependence</li> </ul>	C2	Should Know		
M1-FM-PH-014	<b>Factors affecting drug action-I</b>	<ul style="list-style-type: none"> <li>Discuss different factors affecting drug dose and action</li> <li>Physiological</li> <li>Pathological</li> <li>Psychological</li> <li>Genetic</li> <li>Drug related (drug interactions)</li> <li>Environmental</li> </ul>	C2	Should Know	LGIS	MCQ SAQ/SEQ VIVA
M1-FM-PH-015	<b>Factors affecting drug action -II</b>	<ul style="list-style-type: none"> <li>Explain Synergism, Summation and Potentiation Accumulation</li> </ul>	C2	Should Know	LGIS	MCQ SAQ/SEQ VIVA
M1-FM-PH-016	<b>Adverse drug reactions</b>	<ul style="list-style-type: none"> <li>Define adverse drug reaction (ADR)</li> </ul>	C1	Must Know	LGIS	MCQ SAQ/SEQ VIVA
		<ul style="list-style-type: none"> <li>Classify ADRs based on type and severity</li> </ul>	C1	Should Know		
		<ul style="list-style-type: none"> <li>Describe the characteristic of each type of ADR</li> </ul>	C2	Should Know		

		<ul style="list-style-type: none"> <li>Identify predisposing risk factors and approaches to ADR prevention</li> </ul>	C2	Should Know		
		<ul style="list-style-type: none"> <li>Illustrate ways of ADR detection during pre &amp; post marketing evaluation of drugs</li> </ul>	C2	Should Know		
M1-FM-PH-029	<b>Pharmacogenetics</b>	<ul style="list-style-type: none"> <li>Describe the importance of Pharmacogenetics in this specific case</li> </ul>	C3	Must Know	CBL	MCQ SAQ/SEQ VIVA
M1-FM-PH-026	<b>Biostatistics-II</b>	<ul style="list-style-type: none"> <li>Differentiate between mean, median, and mode, and understand when each measure is most appropriate in pharmacological data analysis</li> </ul>	C3	Must Know	SKILL	OSPE
		<ul style="list-style-type: none"> <li>Clearly define variance, standard deviation, and standard error of the mean, and understand the distinctions between these measures.</li> </ul>	C3	Must Know		
		<ul style="list-style-type: none"> <li>Practice calculating variance as a measure of the spread of drug concentration data and interpret the results.</li> </ul>	P-1	Must Know		
M1-FM-PH-023	<b>Signal transduction pathways, principles and diseases</b>	<ul style="list-style-type: none"> <li>Identify the components of signal transduction</li> <li>Explain different signal transduction mechanisms</li> <li>Correlate the role of signal transduction pathways in different diseases</li> </ul>	<ul style="list-style-type: none"> <li>Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition Chapter 2, Page 27-36</li> <li>Goodman and Gillmans The Pharmacological basics of Therapeutics, 14th Edition, Chapter 3, Pg 57-76</li> <li>Valls PO, Esposito A. Signalling dynamics, cell decisions, and homeostatic control in health and disease. <i>Current Opinion in Cell Biology</i>. 2022 Apr 1;75:102066.</li> <li>Su, J., Song, Y., Zhu, Z. <i>et al</i>. Cell-cell communication: new insights and clinical implications. <i>Sig Transduct Target Ther</i> <b>9</b>, 196 (2024). <a href="https://doi.org/10.1038/s41392-024-01888-z">https://doi.org/10.1038/s41392-024-01888-z</a></li> </ul>			LMS based MCQs

			<ul style="list-style-type: none"> <li><a href="https://www.youtube.com/watch?v=9sF_h-bAnIE">https://www.youtube.com/watch?v=9sF_h-bAnIE</a></li> </ul>			
<b>PATHOLOGY</b>						
M1-FM-PATH-018	Chronic and granulomatous inflammation.	Identify the microscopic features and gross appearance of Chronic and Granulomatous Inflammation	P3			
		Value the role of basic investigations in clinical management	A3			
M1-FM-PATH-014	Phagocytosis and Clearance of the Offending Agent	<ul style="list-style-type: none"> <li>Describe the role of cells involved in Phagocytosis and Clearance of the Offending Agent</li> <li>Describe the process of phagocytosis and opsonization</li> <li>Describe the mechanism of action of NETs</li> </ul>	<ul style="list-style-type: none"> <li>Robbins &amp; Cotran Pathologic Basis OF Disease 10th Edition ,Chapter 3 Pg 80--85</li> </ul>			LMS based MCQs
<b>FORENSIC MEDICINE</b>						
M7-FM-F-006	<b>Personal Identity-I</b> Parameters of Identity	<ul style="list-style-type: none"> <li>Describe the importance of personal identity.</li> <li>Enumerate different Parameters of personal identity (Age, sex, race, stature, Tattoo marks, occupational status, Anthropometryetc)</li> <li>Briefly explain different methods to determine the personal identity.</li> <li>Define Poroscopy, Cheiloscopy,Dactylography, Anthropometry, Trace evidence and Locard's Principle of exchange w.r.t Personal Identity.</li> </ul>	C2 C2 C2 C1	should know Must know  should know  Must know	LGIS	MCQs SAQs VIVA
M7-FM-F-007	<b>Personal Identity-II</b> Osteology	<ul style="list-style-type: none"> <li>Define ossification centers</li> <li>Enlist the ossification centers in bones and their appearance with relation to age.</li> <li>Briefly describe the medicolegal importance of different ages.</li> </ul>	C1 C2 C2	Must know Must know should know	LGIS	MCQs SAQs VIVA

M7-FM-F-010	Personal identity	<ul style="list-style-type: none"> <li>Describe the importance of personal identity.</li> <li>Enumerate different Parameters of personal identity (Age, sex, race, stature, Tattoo marks, occupational status, Anthropometryetc)</li> <li>Briefly explain different methods to determine the personal identity.</li> <li>Define Poroscopy, Cheiloscopy, Dactylography, Anthropometry, Trace evidence and Locard's Principle of exchange w.r.t Personal Identity.,</li> </ul>	Parikh "text book of medical jurisprudence forensic medicine and toxicology edition 9  <a href="https://ebooks.inflibnet.ac.in/antp07/chapter/346/">https://ebooks.inflibnet.ac.in/antp07/chapter/346/</a>			LMS based MCQs
M7-FM-F-015	<b>Odontology</b>	<ul style="list-style-type: none"> <li>Define forensic odontology and determine the age of a person w.r.t teeth.</li> <li>Briefly explain the importance of Gustafson's and Boyd's methods.</li> <li>Differentiate between temporary and permanent teeth</li> <li>Identify the medico-legal importance of teeth.</li> <li>Differentiate between temporary and permanent teeth</li> <li>Utilize the basic fingerprint details and their Medico-legal utilization</li> </ul>	C1 C2 C2	Must know  Must know Must know	SKILL	OSPE
<b>SPIRAL COURSES</b>						
<b>Integrated Undergraduate Research Curriculum (IUGRC)</b>						
M1-FM-SI(IUGRC)-003	<b>Inferential Statistics 3</b>  Hypothesis Testing	<ul style="list-style-type: none"> <li>Elaborate the concept of hypothesis testing</li> </ul>	C2	Must know	LGIS	MCQs
		<ul style="list-style-type: none"> <li>Explain role of statistical test of significance in hypothesis testing</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Enlist the steps of hypothesis testing</li> </ul>	C1	Must know		
		<ul style="list-style-type: none"> <li>Appreciate the concept of Level of significance (<math>\alpha</math>)</li> </ul>	C2	Must know		
		<ul style="list-style-type: none"> <li>Interpret p-value in published research results</li> </ul>	C3	Must know		
		<ul style="list-style-type: none"> <li>Enable to interpret the Probability distribution chart</li> </ul>	C3	Must know		
		<ul style="list-style-type: none"> <li>Illustrate sources of type I &amp; type II errors</li> </ul>	C2	Must know		

**SYLLABUS FOR LEARNING MANAGEMENT SYSTEM (LMS)**

Schedule Wks.	Topics of LGIS &SGD*	Topics Of SDL	Learning Objectives of SDL	Learning resources	Mode of assessment
<b>PHARMACOLOGY</b>					
Wk. 4	Tolerance and tachyphylaxis	Signal transduction pathways, principles and disease	<ul style="list-style-type: none"> <li>Identify the components of signal transduction</li> <li>Explain different signal transduction mechanisms</li> <li>Correlate the role of signal transduction pathways in different diseases</li> </ul>	<ul style="list-style-type: none"> <li>Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition Chapter 2, Page 27-36</li> <li>Goodman and Gillmans The Pharmacological basics of Therapeutics, 14th Edition, Chapter 3, Pg 57-76</li> <li>Valls PO, Esposito A. Signalling dynamics, cell decisions, and homeostatic control in health and disease. <i>Current Opinion in Cell Biology</i>. 2022 Apr 1;75:102066.</li> <li>Su, J., Song, Y., Zhu, Z. <i>et al</i>. Cell-cell communication: new insights and clinical implications. <i>Sig Transduct Target Ther</i> 9, 196 (2024). <a href="https://doi.org/10.1038/s41392-024-01888-z">https://doi.org/10.1038/s41392-024-01888-z</a></li> <li><a href="https://www.youtube.com/watch?v=9sF_h-bAnIE">https://www.youtube.com/watch?v=9sF_h-bAnIE</a></li> </ul>	LMS Based MCQS
<b>PATHOLOGY</b>					
	Chronic and granulomatous inflammation	Phagocytosis and Clearance of the Offending Agent	<ul style="list-style-type: none"> <li>Describe the role of cells involved in Phagocytosis and Clearance of the Offending Agent</li> </ul>	<ul style="list-style-type: none"> <li>Robbins &amp; Cotran Pathologic Basis OF Disease 10th Edition ,Chapter 3 Pg 80--85</li> </ul>	LMS Based MCQS

			<ul style="list-style-type: none"> <li>Describe the process of phagocytosis and opsonization</li> <li>Describe the mechanism of action of NETs</li> </ul>		
<b>FORENSIC MEDICINE</b>					
	Personal Identity I & II Odontology	Personal identity	<ul style="list-style-type: none"> <li>Describe the importance of personal identity.</li> <li>Enumerate different Parameters of personal identity (Age, sex, race, stature, Tattoo marks, occupational status, Anthropometryetc)</li> <li>Briefly explain different methods to determine the personal identity.</li> <li>Define Poroscopy, Cheiloscopy, Dactylography, Anthropometry, Trace evidence and Locard's Principle of exchange w.r.t Personal Identity.,</li> </ul>	Parikh "text book of medical jurisprudence forensic medicine and toxicology edition 9  <a href="https://ebooks.inflibnet.ac.in/antp07/chapter/346/">https://ebooks.inflibnet.ac.in/antp07/chapter/346/</a> <ul style="list-style-type: none"> <li></li> </ul>	LMS based MCQs

### Distribution of Teaching Hours of Disciplines

Sr. No.	Discipline	LGIS	SGD	CBL	SDL	Total
1.	Pharmacology	17	03	02	04	26
2.	Pathology	06	04	03	04	17
3.	Forensic Medicine	07	0	0	04	11
4.	Surgery	06	0	0	0	06
5.	Medicine	06	0	0	0	06
6.	Family Medicine	01	0	0	0	01
7.	Research	03	0	0	0	03
9.	Behavioral Sciences	03	0	0	04	07
	Total hours	51	07	05	16	79

### Practical & Clerkship Hours

Disciplines	Practical hours	Disciplines	Clerkship hours
Pharmacology	2x4 = 08 hrs	Surgery	2.5 x 16 = 35 hrs
Pathology	2x4 = 08 hrs	Medicine	2.5 x 16 = 35 hrs
Forensic Medicine	2x4 = 08 hrs	Sub Specialty	2.5 x 16 = 35 hrs

LGIS \*

SGD\*\*

CBL\*\*\*

SDL\*\*\*\*

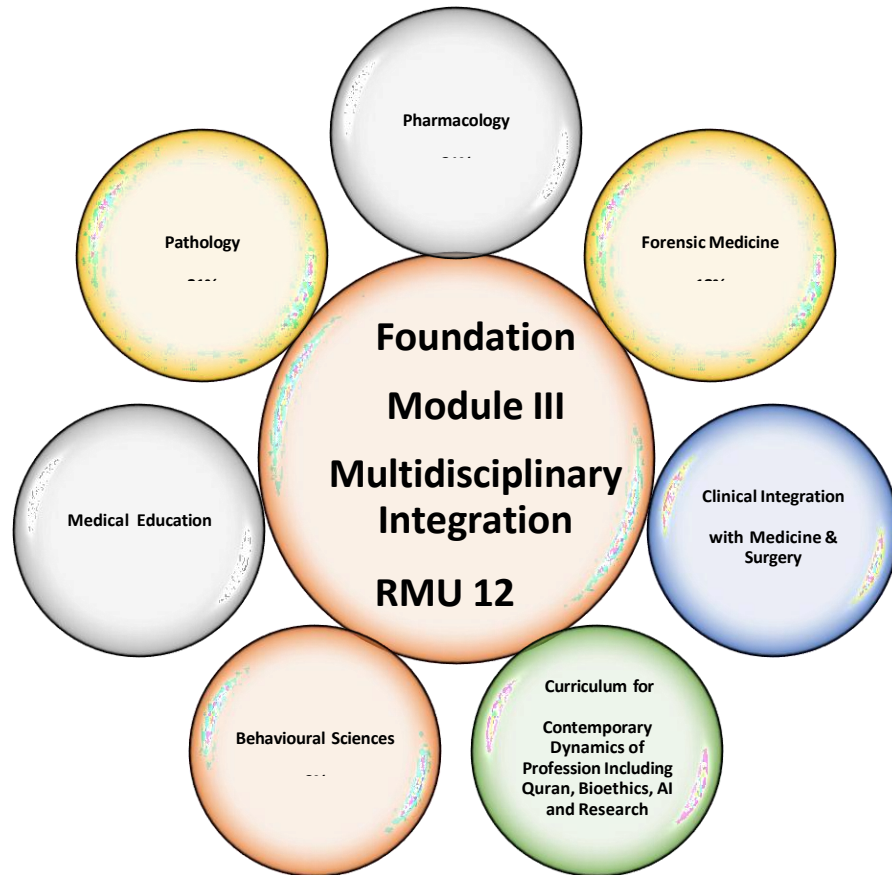
**RMU – 12 Integrated Modular MBBS Curriculum 2026**  
**Isolation to Beyond Boundaries**

**Third Year MBBS 2026**

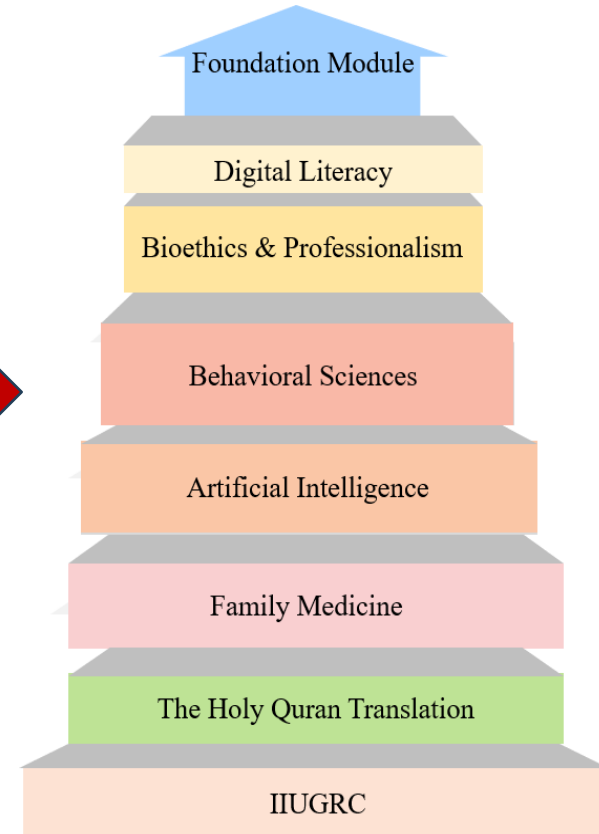
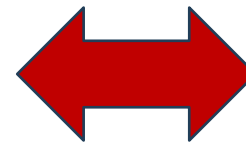
**Foundation Module -III**

## Multidisciplinary Approach for Foundation Module III

### RMU-12 Isolation to Beyond Boundaries



**Disciplines in Foundation Module-III**



**Spiral / General Education Cluster Courses (5%)**

### Discipline Wise Details of Modular Content

Discipline	Content	
F O U N D A T I O N	<b>Module Orientation</b>	
	<b>Department of Medical Education</b>	<ul style="list-style-type: none"> <li>• Interplay of Paraclinical Sciences.</li> <li>• Navigation to module requirements.</li> <li>• Application of Professional ethics.</li> </ul>
	<b>Core Components</b>	
	<b>Pharmacology</b>	<ul style="list-style-type: none"> <li>• Introduction to ANS</li> <li>• Parasympathomimetics</li> <li>• Parasympatholytics</li> <li>• Sympathomimetics</li> <li>• Sympatholytics</li> </ul>
	<b>Pathology</b>	<ul style="list-style-type: none"> <li>• Hemodynamics Disorders</li> <li>• Genetic Disorder</li> <li>• Neoplasia</li> <li>• Environmental Disorders</li> </ul>
	<b>Forensic Medicine</b>	<ul style="list-style-type: none"> <li>• Personal Identity</li> <li>• Forensic serology</li> <li>• Thanatology</li> <li>• Introduction to General Toxicology</li> </ul>
	<b>Spiral Component</b>	
	<b>Family Medicine</b>	<ul style="list-style-type: none"> <li>• Communication Skills</li> <li>• Fundamentals of History Taking</li> </ul>
	<b>Behavioral Sciences</b>	<ul style="list-style-type: none"> <li>• Counselling and handling of difficult patients and their families</li> <li>• Breaking Bad news</li> <li>• Crisis intervention, Conflict Resolution, Empathy</li> </ul>
	<b>Integrated Undergraduate Research</b>	<ul style="list-style-type: none"> <li>• Inferential statistics 4                             <ul style="list-style-type: none"> <li>o (Chi square test, T test, Z test)</li> </ul> </li> <li>• □ Inferential statistics 5                             <ul style="list-style-type: none"> <li>o (Correlation, ANOVA)</li> </ul> </li> </ul>

<b>M o d u l e  III</b>	<b>Vertical Component</b>	
	<b>Medicine</b>	<ul style="list-style-type: none"> <li>• Symptomology- 1 (common symptoms)</li> <li>• Symptomology- II (specific symptoms and lab investigations)</li> </ul>
	<b>Surgery</b>	<ul style="list-style-type: none"> <li>• Symptomatology in surgery and their diagnostic investigations</li> <li>• Blood and Blood products Transfusion</li> <li>• Basic Principles of Fluid and Electrolytes balance management</li> <li>• Perioperative management of patients</li> <li>• Initial management of trauma</li> </ul>
	<b>Bi-Weekly Joint sessions for Multidisciplinary Integration</b>	

### Foundation III Module Team

Module Name	Foundation Module III				
Duration of module	03 Weeks				
Coordinator	Dr. Haseeba Talat				
Co-coordinator	Dr. Memuna Kanwal				
Reviewed by	Module Committee				
Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Haseeba Talat (AP Pharmacology)
2.	Director DME & Deam Basic Sciences	Prof. Dr. Ifra Saeed	2.	Co-coordinator (Pharmacology)	Dr. Memuna Kanwal
3.	Convener Curriculum	Prof. Dr. Naeem Akhter	3.	Co-coordinator (Pathology)	Dr. Rubab Fatima
4.	Additional Director DME (NTB)	Dr. Kholah Noreen	4.	Co-coordinator (Forensic Medicine)	Dr. Shahrukh
5.	Chairperson Pharmacology	Dr. Zunera Hakim			
6.	Chairperson Pathology	Prof. Dr. Fatima Tuz Zahra			
7.	Chairperson Forensic Medicine	Dr. Filza Ali	<b>DME Implementation Team</b>		
			1.	Director DME	Prof. Dr. Ifra Saeed
8.	Focal Person Medicine	Dr Saima Ambreen	2.	Implementation Incharge 3 <sup>rd</sup> Year MBBS	Dr. Zunera Hakim
9.	Focal Person Surgery	Dr Asifa Dain	3.	Additional Director DME	Dr. Kholah Noreen
10.	Focal Person Behavioral Sciences	Dr. Zona Tahir			
11.	Focal Person Community Medicine	Dr. Affifa Kulsoom			
12.	Chairperson Family Medicine	Dr. Sadia Azam Khan			

## Module II - Foundation Module-III

**Introduction:** *“Welcome to the Foundation-II Module, where we bridge basic sciences with clinical reality through an integrated study of disease mechanisms (Pathology), the science of healing (Pharmacology), and the intersection of medicine and the law (Forensic Medicine). This module is designed to shift the focus from 'what' happens in the body to 'how' we diagnose, treat, and investigate medical cases within a legal framework. By mastering these pillars, students will develop the critical diagnostic and ethical reasoning essential for your upcoming clinical clerkships.”*

**Rationale:** The rationale of this module serves as the **foundational bridge** between basic sciences (Pharmacology/Pathology) and clinical practice. It transitions the student from studying the "healthy body" to understanding the "malfunctioning body" and the physician's role in treating it and upholding the law.

### Module Outcomes

Each student will be able to:

#### Knowledge

- Acquire knowledge about the basic terminologies used in Pharmacology, Pathology & Forensic Medicine as well as the concepts of diseases in the community
- Use technology based medical education including Artificial Intelligence.
- Appreciate concepts & importance of Family Medicine, Biomedical Ethics and Research.

#### Skills

- Interpret and analyze various practical Para-clinical Sciences

#### Attitude

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

This module will run in 4 weeks' duration. The content will be covered through introduction of topics. Instructional strategies are given in the timetable and learning objectives are given in the study guides. Study guides will be uploaded on the university website.

## SECTION – I

### Themes, Learning Objectives, Teaching Strategies & Tool of Assessments

#### Contents

#### Horizontally Integrated Basic Sciences (Pharmacology, Pathology & Forensic Medicine)

- **Large Group Interactive Session:**
  - Pharmacology (LGIS)
  - Pathology (LGIS)
  - Forensic Medicine (LGIS)
- **Small Group Discussions:**
  - Pharmacology (SGD)
  - Pathology (SGD)
  - Forensic Medicine (SGD)
- **Self-Directed Topic, Learning Objectives & References**
  - Pharmacology (SDL)
  - Pathology (SDL)
  - Forensic Medicine (SDL)
- **Skill Laboratory**
  - Pharmacology (SKL)
  - Pathology (SKL)
  - Forensic Medicine (SKL)

**Foundation III Module – 3<sup>rd</sup> Year MBBS****Duration: 3 weeks**

<b>Sr. No</b>	<b>Theme</b>	<b>Duration</b>
1	Autonomic Regulation, Toxicology and Environmental Health in Clinical Practice	1 <sup>st</sup> WEEK
2	Circulatory Failure and Hemodynamic Crisis: Integrated Management of Shock and Vascular Emergencies.”	2 <sup>nd</sup> WEEK
3	Adrenergic Modulation, Genetic Disorders, Carcinogenesis and Medico-Legal Aspects of Death	3 <sup>rd</sup> WEEK

**THEME 1: Autonomic Regulation, Toxicology and Environmental Health in Clinical Practice  
(Week 1)**

RATIONALE	GENERAL LEARNING OBJECTIVES
<p>The autonomic nervous system regulates vital physiological functions such as cardiovascular tone, respiration, glandular secretion, and gastrointestinal activity. Disruption of autonomic control by drugs, environmental toxins, heavy metals, or poisons can lead to serious clinical emergencies.</p> <p>This week integrates autonomic pharmacology with organophosphate and toxic plant poisoning, environmental and heavy metal toxicity, thromboembolic disorders, and forensic toxicology to demonstrate how receptor-level interactions produce systemic clinical effects. Forensic medicine highlights identification in mass disasters, DNA fingerprinting, and toxicological investigations, while behavioral sciences and family medicine emphasize communication skills in critical situations. Research methodology further strengthens interpretation of clinical and epidemiological data.</p> <p>This theme prepares students to recognize autonomic dysfunction, manage poisoning cases rationally, interpret toxicological findings, and address medico-legal responsibilities in clinical practice.</p>	<p>By the end of this theme, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the functional roles of the sympathetic and parasympathetic divisions of the autonomic nervous system.</li> <li>2. Classify cholinergic drugs and anticholinesterases and correlate receptor activation with their pharmacological effects.</li> <li>3. Explain the mechanisms, therapeutic uses, and adverse effects of cholinomimetics, anticholinergics, and botulinum toxin.</li> <li>4. Recognize clinical features of organophosphate, mushroom, datura, and lead poisoning and outline appropriate management strategies.</li> <li>5. Apply principles of pharmacological dose calculations in clinical and emergency settings.</li> <li>6. Explain the pathophysiology of environmental and chemical toxicities and relate them to systemic and hematological manifestations.</li> <li>7. Describe the mechanisms and morphology of thrombosis, embolism, infarction, and chronic venous congestion and interpret coagulation profiles.</li> <li>8. Define and classify poisons and explain factors affecting their absorption, distribution, metabolism, and elimination.</li> <li>9. Demonstrate principles of forensic identification, including DNA fingerprinting, blood stain examination, and identification in mass disasters.</li> <li>10. Demonstrate effective communication skills in clinical practice, including breaking bad news and counseling patients and families in poisoning or critical illness.</li> </ol>

**SPECIFIC LEARNING OBJECTIVES**  
**Horizontally Integrated Basic Sciences (Pharmacology, Pathology & Forensic Medicine)**

Code	Topic	Learning Objectives	Learning Domain	Calgary Gauge	Teaching Strategy	Assessment
<b>PHARMACOLOGY</b>						
M2-FM-III-PH- 001	Introduction to ANS	<ul style="list-style-type: none"> <li>Describe the general organization of autonomic nervous system</li> <li>Describe the basic characteristics of sympathetic and parasympathetic systems</li> </ul>	C1 C2	Good to know Should know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH- 002	Parasympathomimetic-I	<ul style="list-style-type: none"> <li>Identify location of cholinergic receptors and molecular mechanism of their activation</li> <li>Classify cholinomimetics</li> <li>Describe the pharmacological effects produced by the activation of these receptors</li> <li>Describe uses and adverse effects of cholinomimetics.</li> <li>Identify location of cholinergic receptors and molecular mechanism of their activation</li> </ul>	C1 C1 C2 C2 C1	Must know Must know Must know Must know Must know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH- 003	Parasympathomimetic- II	<ul style="list-style-type: none"> <li>Classify anticholinesterases</li> <li>Describe the mechanism of action and adverse effects of anticholinesterases</li> </ul>	C1 C2	Must know Must know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH- 004	Parasympatholytic drugs-I	<ul style="list-style-type: none"> <li>Identify location of cholinergic receptors and molecular mechanism of their activation</li> <li>Classify cholinomimetics</li> <li>Describe the pharmacological effects produced by the activation of these receptors</li> </ul>	C1 C1 C2	Must know Must know Must know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-005	Parasympatholytic drugs-II	<ul style="list-style-type: none"> <li>Describe uses and adverse effects of cholinomimetics.</li> <li>Compare &amp; contrast hyoscine &amp; atropine</li> </ul>	C2 C3	Must know Must know	LGIS	MCQ SAQ/SEQ VIVA

M2-FM-III-PH-006	Organophosphate poisoning	<ul style="list-style-type: none"> <li>Recognize the clinical features of Organophosphate Poisoning</li> <li>Evaluate the role of oximes in organophosphate poisoning</li> <li>Design the management plan for organophosphate poisoning</li> </ul>	C2 C2 C4	Must know Must know Must know	CBL	MCQ SAQ/SEQ VIVA
M2-FM-III-PH- 007	Mushroom and dhatura poisoning	<ul style="list-style-type: none"> <li>Recognize the clinical features of both poisonings</li> <li>Evaluate the role of anticholinergics in both poisonings</li> <li>Design the management plan for both poisonings</li> </ul>	C2 C2 C2 C4	Must know Must know Must know Must know	CBL	MCQ SAQ/SEQ VIVA
M2-FM-III-PH- 008	Effect of miotic on rabbit's eye	<ul style="list-style-type: none"> <li>Recall the effects of miotic on eye</li> <li>Interpret the results of the drug instilled in rabbit's eye</li> </ul>	C1 P3	Must Know Must Know	SKILL	OSPE
M2-FM-III-PH- 009	Botulinum toxin	<ul style="list-style-type: none"> <li>Discuss mechanism of action of botulinum</li> <li>Enumerate uses and adverse effects of botulinum</li> </ul>	Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition, Chapter 6, Page 99 pg 136,1232			MCQS
<b>PATHOLOGY</b>						
M2-FM-III-PATH-001	Diagnosis of Drug Toxicity	<ul style="list-style-type: none"> <li>Explain Mechanism of Drug Toxicity</li> <li>Give diagnosis monitoring and treatment of aspirin, paracetamol toxicity</li> </ul>	C1 C2	Must know Must know	LGIS	MCQs SAQs VIVA
M2-FM-III-PATH-002	Lead poisoning	<ul style="list-style-type: none"> <li>Discuss causes of lead poisoning</li> <li>Describe the pathogenic effects of lead poisoning</li> <li>Discuss clinical and morphological features of lead poisoning anemia</li> </ul>	C2 C2 C2	Must know Must know Need to know	CBL	PBQ

M2-FM-III- PATH-003	Pathophysiology of Thrombo- embolism	<ul style="list-style-type: none"> <li>• Define Thrombus &amp;Virchow’s triad</li> <li>• Describe Causes of hypercoagulability</li> <li>• Explain fate of thrombus, morphology of venous thrombosis</li> <li>• Differentiate between arterial and venous thrombosis</li> <li>• Correlate pathogenesis of Disseminated- intravascular coagulation clinical presentation</li> <li>• Classify embolism on the basis of etiology</li> </ul>	<p>C1</p> <p>C2</p> <p>C2</p> <p>C3</p> <p>C3</p> <p>C1</p>	<p>Must know</p> <p>Must know</p> <p>Must know</p> <p>Must know</p> <p>Must know</p> <p>Must know</p>	<p>LGIS</p>	<p>MCQs</p> <p>SAQs</p> <p>VIVA</p>
M2-FM-III- PATH-004	Chronic Venous Congestion, Thrombosis, Infarction	<ul style="list-style-type: none"> <li>• Illustrate morphology of Chronic Venous Congestion, Thrombosis and Infarction with help of diagram</li> <li>• Interpret report of coagulation profile</li> <li>• Be considerate of cost effectiveness and risk-benefit analysis while ordering investigations in a patient</li> </ul>	<p>P3</p> <p>P3</p> <p>A2</p>	<p>Must know</p> <p>Must know</p> <p>Need to know</p>	<p>Practical</p>	<p>OSPE</p>
M2-FM-III- PATH-005	Embolism and types of embolism	<ul style="list-style-type: none"> <li>• Define and classify embolism</li> <li>• Explain clinical Importance and treatment of different types of embolism.</li> <li>• Describe morphology of different types of emboli.</li> <li>• Diagnose a case of embolism based on different laboratory tests.</li> </ul>	<ul style="list-style-type: none"> <li>• Robbins &amp; Cotran Pathologic Basis OF Disease, 10th Edition, Chapter 1, Pg 112—114</li> </ul>			<p>MCQs</p>
<b>FORENSIC MEDICINE</b>						
M2-FM-III-F-001	Forensic serology  Trace evidence	<ul style="list-style-type: none"> <li>• Briefly explain the forensic importance of biological specimens (Blood, Semen, Salvia, Vomitus, Breath, Urine, Hair).</li> <li>• Collects, preserve, dispatch various human body specimens</li> </ul>	<p>C2</p> <p>C2</p>	<p>Must know</p> <p>Must know</p>	<p>LGIS</p>	<p>MCQs</p> <p>SAQs</p> <p>VIVA</p>

M2-FM-III-F-002	General Toxicology-I Introduction and classification of poisons	<ul style="list-style-type: none"> <li>Define Poison, Drug, Therapeutic dose and lethal dose.</li> <li>Enlist different routes of administration and elimination of poison.</li> <li>Briefly explain the actions and factors affecting the absorption of poison.</li> <li>Classify the poisons according to nature, mode, source, manner and medicolegal importance with example of each group.</li> </ul>	C1 C2 C3 C2	Must know Must know Need to know Must know	LGIS	MCQs SAQs VIVA
M2-FM-III-F-003	Personal Identity-III Identification in mass Disasters & Role of radiology	<ul style="list-style-type: none"> <li>Define mass disaster</li> <li>Mention the objectives of Forensic investigation in mass disaster.</li> <li>State different ways through which a dead body can be obliterated</li> <li>Outline briefly special techniques for identification in mass disaster.</li> <li>Briefly explain the method of assessment of age, sex and skeletal injury by using radiology.</li> <li>Define superimposition and describe the role of photography in identification</li> </ul>	C1 C2 C2 C3 C3 C4	Must know Must know Must know Need to know Need to know Good to know	LGIS	MCQs SAQs VIVA
M2-FM-III-F-004	Personal Identity-IV D.N.A finger printing	<ul style="list-style-type: none"> <li>Define DNA finger printing and enlist its different types.</li> <li>State the scope /objectives of DNA finger profiling in forensic Medicine</li> <li>Briefly describe the storage of samples for DNA fingerprinting.</li> <li>Briefly describe the Method of collection preservation and dispatch of samples.</li> <li>State environmental effects on integrity of DNA</li> </ul>	C1 C2 C4 C3 C2	Must know Must know Good to know Need to know Need to know	LGIS	MCQs SAQs VIVA

M2-FM-III-F-005	Examination of Blood Stain (Practical)	<ul style="list-style-type: none"> <li>State the medicolegal importance of biological specimens(Blood)</li> <li>Briefly describe the method to Collect, preserve and dispatch various human body specimens</li> </ul>	C2	Must know	SKILL	OSPE
			C2	Must know		
M2-FM-III-F-006	Role of radiology Identification in mass Disasters	<ul style="list-style-type: none"> <li>The list of ossification centers in bones and their appearance with relation to age.</li> <li>Assessment of age of using radiology</li> <li>Assessment of sex of skeletal remains</li> <li>Medicol legal importance of x-rays in age estimation</li> <li>Outline briefly special techniques for identification in mass disaster</li> </ul>	Essential: Parikhs’’textbook of forensic and toxicology  Recommended: Principles of Forensic Medicine & Toxicology by Gautam Biswas			MCQS
<b>CLINICAL SCIENCES</b>						
<b>MEDICINE</b>						
M2-FMIII-VI(M)-001	Symptomology- 1 (common symptoms)	<ul style="list-style-type: none"> <li>Recognize common symptoms including dyspnea, chest pain, cough, palpitations, vomiting, fever, edema, dysuria and fatigue.</li> <li>Distinguish between acute, chronic and persistent symptoms.</li> <li>Knows important steps involved in history taking of common symptoms.</li> <li>Recognize abnormal lab findings in common symptoms</li> </ul>	C1	Must know	LGIS	MCQs SAQs
			C4	Must know		
			C1	Must know		
			C1	Must know		
<b>SURGERY</b>						
M2-FMIII-VI(S)-001	Symptomatology in surgery and their diagnostic investigations	<ul style="list-style-type: none"> <li>Identify different presenting symptoms in surgical patients</li> <li>Construct differential diagnosis</li> <li>Apply logical approach to laboratory investigations</li> <li>Apply logical approach to radiological and histopathological investigations</li> </ul>	C2	Nice to Know	LGIS	MCQs SAQs
			C2	Should know		
			C2	Should know		
			C2	Should know		

M2-FMIII-VI(S)-001	Perioperative management of patients	<ul style="list-style-type: none"> <li>Describe pre-operative care including high-risk surgical patients</li> <li>Explain principles of post-operative care of surgical patients</li> <li>Describe principles of nutrition and fluid therapy</li> </ul>	C2 C2 C2	Should know Should know Should know	LGIS	MCQs SAQs
<b>SPIRAL COURSES</b>						
<b>BEHAVIORAL SCIENCES</b>						
M2-FMIII-SI(BS)-001	Counselling and handling difficult patients and their families	<ul style="list-style-type: none"> <li>Techniques to handle difficult patients and their families</li> <li>Elaborate on the traits of good counsellor</li> <li>Handling uncertain situations in clinical practice</li> </ul>	C3 C1 C3	Must know Must know Must Know	LGIS	MCQs SEQs SAQs Standard matching
M2-FMIII-SI(BS)-002	Psychosocial Aspect in different hospital settings Dialysis unit	<p>The students should be able to</p> <ul style="list-style-type: none"> <li>Understand the psychosocial impact of chronic kidney disease and dialysis treatment on patients and their families.</li> <li>Develop skills in assessing and addressing psychosocial needs, including coping with illness, treatment adherence, and lifestyle changes.</li> <li>Collaborate with healthcare teams to address psychosocial barriers to optimal dialysis outcomes, such as depression, anxiety, and social isolation.</li> <li>Advocate for patient-centered care practices that promote dignity, autonomy, and quality of life for individuals undergoing dialysis treatment.</li> </ul>	Behavioral Sciences textbook, second edition, Mowadat Rana			M C Q S

### Syllabus Learning Management System (LMS)

Schedule Wks	Topics of LGIS &SGD*	Topics Of SDL	Learning Objectives of SDL	Learning resources	Mode of assessment
<b>PHARMACOLOGY</b>					
Wk. 1	<ul style="list-style-type: none"> <li>• Introduction to ANS</li> <li>• Parasympathomimetics-1</li> <li>• Parasympathomimetics-11</li> <li>• Parasympatholytic drugs</li> <li>• Organophosphate poisoning</li> <li>• Mushroom and dhatura poisoning</li> </ul>	Botulinum toxin	<ul style="list-style-type: none"> <li>• Discuss the mechanism of action of botulinum toxin</li> <li>• Enumerate traditional and novel uses and adverse effects of botulinum</li> </ul>	<p>Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition, Chapter 6, Page 99 pg 136,1232.</p> <p>Sethi N, Singh S, DeBouille K, Rahman E. A review of complications due to the use of botulinum toxin A for cosmetic indications. Aesthetic plastic surgery. 2021 Jun;45(3):1210-20.</p>	LMS Based MCQS
<b>PATHOLOGY</b>					
	<ul style="list-style-type: none"> <li>• Diagnosis of Drug Toxicity</li> <li>• Pathophysiology of Thrombo- embolism</li> <li>• Disorders of Vit. D Metabolism</li> <li>• Lead poisoning</li> <li>• Chronic Venous Congestion, Thrombosis, Infarction</li> <li>• Embolism and types of embolism</li> </ul>	<p>Embolism and types of embolism</p> <p>Environmental pollution</p>	<ul style="list-style-type: none"> <li>• Define and classify embolism</li> <li>• Explain clinical Importance and treatment of different types of embolism.</li> <li>• Describe morphology of different types of emboli.</li> <li>• Diagnose a case of embolism based on different laboratory tests.</li> <li>• Outline salient features of environmental pollution in an article.</li> <li>• Demonstrate responsible behavior towards self-learning.</li> </ul>	<ul style="list-style-type: none"> <li>• Robbins &amp; Cotran Pathologic Basis OF Disease, 10th Edition, Chapter 1, Pg 112—114</li> <li>• Robbins &amp; COTRAN Pathologic Basis OF Disease, 10th Edition, Chapter 1, Pg 302-- 307</li> </ul>	LMS Based MCQS
<b>FORENSIC MEDICINE</b>					

	<ul style="list-style-type: none"> <li>• Personal Identity-III Identification in mass Disasters &amp; Role of radiology</li> <li>• Personal Identity-IV D.N.A finger printing</li> <li>• Forensic Serology</li> <li>• General Toxicology-I Introduction and classification of poisons</li> <li>• Examination of Blood Stain</li> </ul>	<p>Role of radiology Identification in mass Disasters</p>	<ul style="list-style-type: none"> <li>• The list of ossification centers in bones and their appearance with relation to age.</li> <li>• Assessment of age of using radiology</li> <li>• Assessment of sex of skeletal remains</li> <li>• Medicol legal importance of x-rays in age estimation</li> <li>• Outline briefly special techniques for identification in mass disaster</li> </ul>	<p>Essential: Parikhs”textbook of forensic and toxicology</p> <p>Recommended: Principles of Forensic Medicine &amp; Toxicology by Gautam Biswas</p>	<p>LMS Based MCQS</p>
<b>BEHAVIORAL SCIENCES</b>					
	<ul style="list-style-type: none"> <li>• Counselling and handling difficult patients and their families</li> </ul>	<ul style="list-style-type: none"> <li>• Psychosocial Aspect in different hospital settings Dialysis unit</li> </ul>	<p>The students should be able to</p> <ul style="list-style-type: none"> <li>• Understand the psychosocial impact of chronic kidney disease and dialysis treatment on patients and their families.</li> <li>• Develop skills in assessing and addressing psychosocial needs, including coping with illness, treatment adherence, and lifestyle changes.</li> <li>• Collaborate with healthcare teams to address psychosocial barriers to optimal dialysis outcomes, such as depression, anxiety, and social isolation.</li> <li>• Advocate for patient-centered care practices that promote dignity, autonomy, and quality of life for individuals undergoing dialysis treatment.</li> </ul>	<p>Behavioral Sciences textbook, second edition Mowadat Rana</p>	<p>LMS Based MCQS</p>

<b>THEME 2: Circulatory Failure and Hemodynamic Crisis: Integrated Management of Shock and Vascular Emergencies.” (WEEK 2)</b>		
<b>WEEK</b>	<b>RATIONALE</b>	<b>GENERAL LEARNING OBJECTIVES</b>
<b>2</b>	<p>Maintenance of circulation is fundamental to life. The autonomic nervous system, vascular integrity, coagulation pathways, and intravascular volume collectively determine tissue perfusion. This week integrates sympathomimetic pharmacology, mechanisms of shock, hemorrhage, thromboembolism, infarction, and fluid resuscitation to help students understand how failure of circulatory homeostasis leads to life-threatening states.</p> <p>Through the study of hypovolemic and anaphylactic shock, pheochromocytoma, edema, thromboembolism, and perioperative fluid management, students move beyond isolated concepts of receptors, mediators, and pathology to clinically relevant decision-making. The integration of forensic medicine highlights medico-legal implications of trauma and biological evidence, while behavioral sciences emphasize communication in high-stress emergencies. Research skills in correlation analysis reinforce interpretation of hemodynamic data in clinical studies.</p> <p>This theme prepares students to respond safely, rationally, and ethically when circulatory stability is compromised.</p>	<p><b>By the end of this theme, students will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Classify sympathomimetic drugs based on mechanism and receptor selectivity.</li> <li>2. Correlate receptor selectivity with pharmacological effects and clinical uses, especially in anaphylactic shock.</li> <li>3. Differentiate catecholamines from non-catecholamines and compare sympathomimetics with epinephrine.</li> <li>4. Define and classify shock and identify its type and stage in clinical settings.</li> <li>5. Correlate stages of shock with underlying hemodynamic and biochemical changes.</li> <li>6. Explain the pathogenesis of edema, hemorrhage, thromboembolism, and infarction.</li> <li>7. Interpret clinical signs and laboratory findings in circulatory compromise.</li> <li>8. Apply principles of fluid resuscitation, including selection of crystalloids, colloids, and blood products.</li> <li>9. Outline pharmacological management of pheochromocytoma based on receptor mechanisms.</li> <li>10. Demonstrate proper medico-legal handling of biological evidence in trauma cases.</li> <li>11. Demonstrate effective counseling and communication skills in emergency situations.</li> <li>12. Interpret correlation analysis in clinical data and relate findings to hemodynamic parameters.</li> </ol>

**Case based discussion for Clinico Connect (Transdisciplinary Clinical Reasoning Forum-TCRF)**

**Case 1: “Road traffic trauma with hypovolemic shock”**

A 32-year-old male motorcyclist is brought to the emergency department by bystanders following a road traffic accident. According to witnesses, his motorcycle collided with a truck at a busy intersection approximately 40 minutes prior to arrival. He was not wearing a helmet at the time of the accident and was thrown several meters from the motorcycle after the impact. On arrival at the emergency department, the patient is conscious but visibly restless and anxious. He appears pale and is continuously asking for water, complaining of intense thirst. His clothes are stained with blood, and there are visible abrasions and possible injuries to the limbs and trunk. He is repeatedly attempting to sit up despite instructions to remain still, suggesting agitation and discomfort following the trauma. He is conscious but restless and repeatedly asking for water.

**Clinical Examination**

- Blood Pressure: 80/50 mmHg
- Pulse: 132/min (thready)
- Respiratory Rate: 28/min
- Skin: Cold, clammy, pale
- Capillary refill time: >3 seconds
- Jugular venous pressure: Collapsed
- Abdomen: Distended with tenderness
- Urine output: Minimal

**Laboratory & Initial Investigations**

- Hemoglobin: 8.2 g/dL
- Serum Lactate: Elevated
- ABG: Metabolic acidosis
- FAST ultrasound: Free fluid in abdomen

**Educational Relevance to Theme**


- Acute blood loss and decreased preload
- Compensatory sympathetic activation

**Case: Road Traffic Trauma with Hypovolemic Shock**

32-year-old male motorcyclist brought to the ED after collision with a truck while not wearing a helmet.

Approximately 40 minutes after the accident:

- Conscious but restless, pale, and repeatedly asking for water.



**MANAGEMENT OF TRAUMA AND HYPOVOLEMIA: Bridging Acute Care, Pathology, and Forensic Medicine**

**Disciplines Involved**

<p><b>Emergency Medicine</b></p> <ul style="list-style-type: none"> <li>• Rapid assessment ATLS protocol</li> <li>• IV fluids &amp; blood transfusion</li> </ul>	<p><b>Pathology</b></p> <ul style="list-style-type: none"> <li>• Hemorrhage, shock, DIC,</li> <li>• Laboratory interpretation</li> </ul>	<p><b>Surgery</b></p> <ul style="list-style-type: none"> <li>• Bleeding control</li> <li>• Damage control surgery</li> <li>• Post-operative monitoring</li> </ul>	<p><b>Forensic Medicine</b></p> <ul style="list-style-type: none"> <li>• Identifying and documenting wounds</li> <li>• Chain of custody</li> <li>• Toxicology tests</li> </ul>
<p><b>Behavioral Sciences &amp; Ethics</b></p> <ul style="list-style-type: none"> <li>• Obtain history from bystander/relative</li> <li>• Crisis communication</li> <li>• Medical and legal information to family</li> </ul>		<p><b>Forensic Medicine &amp; Special Sciences</b></p> <ul style="list-style-type: none"> <li>• Identify &amp; documenting wounds</li> <li>• Chain of custody</li> <li>• Toxicology tests</li> </ul>	

**— Key Message —**

Managing trauma with impending shock requires rapid, integrated interventions to stabilize the patient and address medico-legal aspects.

Managing trauma with impending shock requires rapid, integrated interventions to stabilize the patient and address medico-legal aspects.

- Cellular hypoxia and lactic acidosis
- Transition from reversible to irreversible shock
- Fluid resuscitation vs blood transfusion decisions
- Surgical source control
- Medico-legal documentation in trauma
- Communication with family during critical care

### **How This Case Fits the Theme**

This case demonstrates that shock is not a subject-based phenomenon.

Safe management requires simultaneous integration of hemodynamics, pharmacology, cellular pathology, surgical judgment, ethical reasoning, and legal awareness

### **What Makes This RMU-12**

- No subject headings.
- Knowledge domains are embedded within clinical reasoning
- The organizing principle is the **patient problem**, not discipline
- Learning mimics authentic clinical decision-making.

**Clinico- Connect (Transdisciplinary Clinical Reasoning Forum- TCR) - Hardens Level 11 for 2<sup>nd</sup> Week**

<b>Session</b>	<b>Topic</b>	<b>Department</b>	<b>At the End of Session Student Should Be Able To</b>	<b>Learning Domain</b>	<b>Assessment Tool</b>
C <sup>3</sup> <sub>6</sub> TCRF-1	A Case of Hypovolemic Shock and Integrated Emergency Management	Physiology	Explain the cardiovascular changes following acute blood loss, including effects on venous return, cardiac output, and arterial pressure. Describe compensatory physiological mechanisms in hypovolemic shock, including sympathetic activation and hormonal responses.	C2 C2	MCQs
		Pathology	Understand pathophysiology of shock, correlate its stages with organ/cellular changes, and interpret relevant labs and hemodynamic parameters	C4	MCQ
		Pharmacology	Analyze the choice of IV fluids and vasopressor use in hypovolemic shock and justify rational drug selection.	C4	MCQ
		Medicine	Perform systematic assessment of a patient in shock using ABC approach and interpret vital parameters and laboratory findings.	C4	OSCE / EPA
		Surgery	Recognize hypovolemic shock in trauma patients from history and clinical signs Decide timely surgical intervention for internal hemorrhage and outline principles of damage control surgery.	C4	OSCE
		Forensic Medicine	Identify road traffic trauma as medico-legal case and demonstrate proper documentation and injury certification.	C3	MCQ
		Behavioral Sciences	Apply principles of crisis communication, implied consent, and family counseling in emergency shock management.	C4	MCQ
		Family Medicine	Propose preventive strategies for road traffic injuries and outline community-based interventions for trauma reduction.	C3	MCQ

**SPECIFIC LEARNING OBJECTIVES****Horizontally Integrated Basic Sciences (Pharmacology, Pathology & Forensic Medicine)**

Code	Topic	Learning Objectives	Learning Domain	Calgary Gauge	Teaching Strategy	Assessment
<b>PHARMACOLOGY</b>						
M2-FM-III-PH-010	Sympathomimetic drugs-I	<ul style="list-style-type: none"> <li>Classify Sympathomimetics</li> <li>Identify receptors selectivity of sympathomimetic drugs</li> <li>Discuss structure activity relationship of sympathomimetics</li> <li>Differentiate between catecholamines and non-catecholamine</li> </ul>	C2 C2 C2 C3	Must Know Must Know Must Know Must Know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-011	Sympathomimetic drugs-II	<ul style="list-style-type: none"> <li>Describe the pharmacological effects, produced by sympathomimetics</li> </ul>	C2	Must Know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-012	Sympathomimetic drugs-III	<ul style="list-style-type: none"> <li>Compare different sympathomimetics in relation with epinephrine</li> </ul>	C3	Must Know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-013	Anaphylactic shock	<ul style="list-style-type: none"> <li>Manage the given case</li> <li>Describe the effect of epinephrine on vascular and pulmonary systems and the receptors involved</li> </ul>	C4 C2	Must Know Must Know	CBL	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-014	Effect of mydriatics on rabbit's eye	<ul style="list-style-type: none"> <li>Recall the effects of mydriatics on eye</li> <li>Interpret the results of the drug instilled in rabbit's eye</li> </ul>	C1 P3	Must Know Must Know	SKILL	OSPE
M2-FM-III-PH-015	Pheochromocytoma	<ul style="list-style-type: none"> <li>Identify the most likely diagnosis.</li> <li>Discuss the pharmacological management of pheochromocytoma</li> </ul>	C2 C3	Must Know Must Know	CBL	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-016	$\beta_3$ Receptor Agonists	<ul style="list-style-type: none"> <li>Describe the mechanism of action of mirabegron through <math>\beta_3</math> adrenergic receptor stimulation.</li> <li>Differentiate mirabegron from antimuscarinic drugs used in overactive bladder.</li> </ul>	Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition, Chapter 10, Page 165-168			MCQS

PATHOLOGY						
M2-FM-III-PATH-006	Types of hemorrhage	<ul style="list-style-type: none"> <li>Define Hemorrhage.</li> <li>Describe Normal Coagulation Cascade.</li> <li>Enlist Types of hemorrhages with examples.</li> <li>Describe Concept of Petechiae, ecchymosis and bruises</li> </ul>	C1 C2 C1 C2	Must know Must know Must know Nice to know	SGD	MCQ SAQ/SEQ VIVA
M2-FM-III-PATH-007	Morphological changes in Infarction	<ul style="list-style-type: none"> <li>Define Infarct.</li> <li>Explain types of infarcts.</li> <li>Explain causes of infarct.</li> <li>Describe morphology of infarct.</li> </ul>	C1 C2 C2 C2	Must know Must know Must know Must know	SGD	MCQ SAQ/SEQ VIVA
M2-FM-III-PATH-008	Pathophysiology of Edema	<ul style="list-style-type: none"> <li>Classify edema on the basis of etiology and pathogenesis</li> <li>Differentiate b/w edema in various clinical settings</li> </ul>	C3 C3	Must know Must know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PATH-009	Etiology and pathogenesis of Shock	<ul style="list-style-type: none"> <li>Define shock</li> <li>Classify shock on the basis of etiology and pathogenesis</li> <li>Correlate the stages of shock with underlying pathogenic mechanisms</li> <li>Identify the type of shock in clinical setting and the stage</li> <li>Describe the Biochemical and immune abnormalities in shock</li> </ul>	C1 C3 C3 C2 C3	Must know Must know Must know Must know	CBL	MCQ SAQ/SEQ VIVA
M2-FM-III-PATH-010	Nomenclature and characteristics of tumors	<ul style="list-style-type: none"> <li>Define and classify neoplasia</li> <li>Describe nomenclature of neoplasms</li> <li>Differentiate between benign and malignant tumors</li> </ul>	C1 C2 C2	Must know Must know Must know	SGD	MCQs SAQs VIVA
M2-FM-III-PATH-011	Diagnosis of benign neoplasia	<ul style="list-style-type: none"> <li>Diagnosing a case of benign tumor on the basis of different laboratory tests</li> <li>Describe morphology of benign tumors (gross &amp; microscopy)</li> <li>Demonstrate adequate interpersonal skills and collaborative teamwork</li> <li>Identify the microscopic features and gross appearance of Chronic and Granulomatous Inflammation</li> <li>Value role of basic investigations in clinical management</li> </ul>	P3 P2 A2 P1 A3	Must know Must know Must know Must know Nice to know	SKILL	OSPE

M2-FM-III-PATH-012	Nutritional disorder Macronutrients/Micronutrient insufficiency	<ul style="list-style-type: none"> <li>• Explain Macronutrient/Micro-nutrient insufficiency</li> <li>• Explain Dietary insufficiency, Protein energy Malnutrition, Anorexia Nervosa and Bulimia, Vitamin Deficiency, Obesity, Diets, Cancers and Atherosclerosis.</li> <li>• Demonstrate understanding of team work in diagnosing a patient with multiple health issues</li> </ul>	Robbins & Cotran Pathologic Basis OF Disease 10th Edition Chapter 3 Pg 80—85			MCQS
<b>FORENSIC MEDICINE</b>						
M2-FM-III-F-007	<b>Thanatology- I</b> (Introduction & Types of death) Immediate & Early changes of death)	<ul style="list-style-type: none"> <li>• Define death and Classify its types</li> <li>• State the WHO criteria &amp; indicators to diagnose death.</li> <li>• Briefly describe the causes, manner, mode, mechanisms, medico legal aspects of death</li> <li>• Define Algor mortis and state its medico-legal importance</li> <li>• Briefly explain the method to measure the temperature of body after death.</li> <li>• Enlist various factors affecting algor mortis.</li> <li>• Briefly describe postmortem calorcity.</li> </ul>	C1 C2 C3  C2 C2  C1 C2	Must know Must know Need to know  Must know Must know  Must know Must know	LGIS	MCQs SAQs  VIVA
M2-FM-III-F-008	<b>Thanatology- II</b> (Livor mortis & Rigor mortis)	<ul style="list-style-type: none"> <li>• Define Livor mortis and state its medico legal importance.</li> <li>• Differentiate between Livor mortis and bruise.</li> <li>• State the mechanism of Rigor Mortis in the body after death and its medico legal importance?</li> <li>• Enumerate the factors which modify the onset &amp; duration of rigor mortis?</li> <li>• Enlist the conditions simulating rigor mortis and differentiate them</li> </ul>	C1 C2 C3  C2  C2	Must know Must know Need to know  Must know  Must know	LGIS	MCQs SAQs  VIVA
M2-FM-III-F-009	Examination of hair and fiber	<ul style="list-style-type: none"> <li>• Differentiate between human &amp; animal Hair and Hair &amp; Fiber</li> <li>• State the medicolegal importance of hair in identification.</li> <li>• State the importance of hair as trace evidence</li> </ul>	C3  C2  C2	Must know  Must know  Must know	SKILL	OSPE

M2-FM-III-F-010	D.N.A finger printing Examination of Hair & Fiber	<ul style="list-style-type: none"> <li>Define DNA finger printing</li> <li>Define the forensic importance and application of DNA finger printing</li> <li>Differentiate between human &amp; animal Hair and Hair &amp; Fiber</li> <li>State the medicolegal importance of hair in identification and as trace evidence</li> </ul>	Essential: Parikshit book of forensic and toxicology		Recommended: Principles of Forensic Medicine & Toxicology by Gautam Biswas		MCQS
<b>CLINICAL SCIENCES</b>							
<b>MEDICINE</b>							
M2-FMIII-VI(M)-002	Symptomology- II (specific symptoms and lab investigations)	<ul style="list-style-type: none"> <li>Recognize important signs during clinical examinations.</li> <li>Recognize abnormal lab findings in common symptoms</li> </ul>	C2 C2	Must know Must know	LGIS	MCQs SAQs	
<b>SURGERY</b>							
M2-FMIII-VI(S)-003	Basic principles of fluid and electrolyte balance management	<ul style="list-style-type: none"> <li>Define body fluid compartments and distribution</li> <li>List types of parenteral fluids (crystalloids and colloids)</li> <li>Explain role of crystalloids and colloids in fluid resuscitation</li> <li>Recall common electrolyte imbalances (hypernatremia, hypokalemia, hyperkalemia)</li> <li>Summarize pathophysiology of major electrolyte disorders</li> </ul>	C1 C1 C2 C1 C2	Should Know Nice to Know Should Know Should Know Should Know	LGIS	MCQs SAQs	
M2-FMIII-VI(S)-004	Blood and blood products	<ul style="list-style-type: none"> <li>Define and classify shock</li> <li>Explain pathophysiology of shock</li> <li>Differentiate types of shock based on clinical presentation</li> <li>Outline management principles of shock</li> <li>Describe blood components and their indications</li> </ul>	C2 C2 C3 C4 C2	Should Know Should Know Should Know Should Know Nice to Know	LGIS	MCQs SAQs	
<b>SPIRAL COURSES</b>							
<b>BEHAVIORAL SCIENCES</b>							

M2-FMIII-SIBS)-003	Breaking bad news	<ul style="list-style-type: none"> <li>Elaborate the model for breaking bad news</li> <li>Understand the importance of how to break the bad news</li> </ul>	C3 C3	Must know Must know	LGIS	MCQs SEQs SAQs Standard matching
M2-FMIII-SI(BS)-004	<p><b>Psychosocial Aspect in different hospital settings</b></p> <p>Organ Transplantation</p>	<p>The students should be able to</p> <ul style="list-style-type: none"> <li>Understand the psychosocial impact of organ transplantation on patients, donors, and their families.</li> <li>Develop skills in assessing psychosocial factors influencing transplant candidacy, including emotional stability, social support, and adherence to post-transplant care.</li> <li>Implement strategies to address pre-transplant anxiety, coping with waiting periods, and post-transplant adjustment challenges.</li> <li>Collaborate with transplant teams to provide comprehensive psychosocial support throughout the transplantation process, including education, counseling, and support groups.</li> <li>Advocate for patient rights and ethical considerations in organ allocation, informed consent, and end-of-life decisions in the context of transplantation</li> </ul>	Behavioral Sciences textbook, second edition Mowadat Rana			
<b>Integrated Undergraduate Research Curriculum (IUGRC)</b>						
M2-FMIII-SI(IUGRC)-001	Inferential Statistics 4 (chi-square test)	<ul style="list-style-type: none"> <li>Explain principles of sampling distribution of proportion and standard error proportion</li> <li>Calculate SEP for a given sample proportion</li> <li>Calculate standard error of difference between two proportions</li> <li>Do hypothesis testing by applying chi-square test</li> <li>Elaborate fisher's exact test</li> </ul>	C2 C3 C3 C4 C4	Must know Must know Must know Must know Must know	LGIS	

### Syllabus Learning Management System (LMS)

Schedule Wks	Topics of LGIS &SGD*	Topics of SDL	Learning Objectives of SDL	Learning resources	Mode of assessment
<b>PHARMACOLOGY</b>					
Wk. 2	<ul style="list-style-type: none"> <li>• Sympathomimetic drugs-I</li> <li>• Sympathomimetic drugs-II</li> <li>• Sympathomimetic drugs- III</li> <li>• Anaphylactic shock</li> </ul>	β <sub>3</sub> Receptor Agonists	<ul style="list-style-type: none"> <li>• Describe the mechanism of action of mirabegron through β<sub>3</sub> adrenergic receptor stimulation.</li> <li>• Differentiate mirabegron from antimuscarinic drugs used in overactive bladder.</li> </ul>	Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition, Chapter 10, Page 165-166  Saavedra T JS, Nati-Castillo HA, Valderrama Cometa LA, Castaño-, JS. Pheochromocytoma: an updated scoping review from clinical presentation to management and treatment. <i>Frontiers in Endocrinology</i> . 2024 Dec 13; 15:1433582.	LMS Based MCQS
<b>PATHOLOGY</b>					
	<ul style="list-style-type: none"> <li>• Types of hemorrhage</li> <li>• Morphological changes in Infarction</li> <li>• Pathophysiology of Edema</li> <li>• Etiology and pathogenesis of Shock</li> <li>• Nomenclature of neoplasia</li> <li>• Diagnosis of benign and malignant neoplasia</li> </ul>	Nutritional disorder Macronutrients/ Micronutrient insufficiency	<ul style="list-style-type: none"> <li>• Explain Macronutrient/Micro-nutrient insufficiency</li> <li>• Explain Dietary insufficiency, Protein energy Malnutrition, Anorexia Nervosa and Bulimia, Vitamin Deficiency,</li> <li>• Obesity, Diets, Cancers and Atherosclerosis.</li> <li>• Demonstrate understanding of teamwork in diagnosing a patient with multiple health issues</li> </ul>	Robbins & Cotran Pathologic Basis OF Disease 10th Edition Chapter 3 Pg 80—85	LMS Based MCQS
<b>FORENSIC MEDICINE</b>					

	<ul style="list-style-type: none"> <li>• <b>Thanatology- I</b> (Introduction &amp; Types of death) Immediate &amp; Early changes of death)</li> <li>• <b>Thanatology- II</b> (Livor mortis &amp; Rigor mortis)</li> <li>• Examination of hair and fiber</li> </ul>	<p>D.N.A finger printing Examination of Hair &amp; Fiber</p>	<ul style="list-style-type: none"> <li>• Define DNA finger printing</li> <li>• Define the forensic importance and application of DNA finger printing</li> <li>• Differentiate between human &amp; animal Hair and Hair &amp; Fiber</li> <li>• State the medicolegal importance of hair in identification and as trace evidence</li> </ul>	<p>Essential: Parikhs”text book of forensic and toxicology Recommended: Principles of Forensic Medicine &amp; Toxicology by Gautam Biswas</p>	<p>LMS Based MCQS</p>
<b>BEHAVIORAL SCIENCES</b>					
	<ul style="list-style-type: none"> <li>• Breaking bad news</li> </ul>	<ul style="list-style-type: none"> <li>• Psychosocial Aspect in different hospital settings organ transplantation</li> </ul>	<p>The students should be able to</p> <ul style="list-style-type: none"> <li>• Understand the psychosocial impact of organ transplantation on patients, donors, and their families.</li> <li>• Develop skills in assessing psychosocial factors influencing transplant candidacy, including emotional stability, social support, and adherence to post-transplant care.</li> <li>• Implement strategies to address pre-transplant anxiety, coping with waiting periods, and post-transplant adjustment challenges.</li> <li>• Collaborate with transplant teams to provide comprehensive psychosocial support throughout the transplantation process, including education, counseling, and support groups.</li> <li>• Advocate for patient rights and ethical considerations in organ allocation, informed consent, and end-of-life decisions in the context of transplantation</li> </ul>	<p>Behavioral Sciences textbook, second edition by Mowadat Rana</p>	<p>LMS Based MCQS</p>

<b>THEME 3: Adrenergic Modulation, Genetic Disorders, Carcinogenesis and Medico-Legal Aspects of Death.”</b>		
<b>WEEK 3</b>		
<b>WEEK</b>	<b>RATIONALE</b>	<b>GENERAL LEARNING OBJECTIVES</b>
<b>3</b>	<p>This week integrates autonomic pharmacology with genetic pathology, oncogenesis, and forensic medicine to illustrate how molecular and receptor-level alterations influence systemic disease and clinical outcomes. Adrenergic and ganglion blockers demonstrate the pharmacological regulation of sympathetic pathways and cardiovascular function. The study of genetic disorders, tumor biology, environmental carcinogenesis, and nutritional disorders links molecular changes with disease development. Forensic medicine topics such as thanatology, postmortem changes, and personal identification highlight the medico-legal relevance of biological processes, while behavioral sciences emphasize crisis management and empathetic patient care.</p>	<p><b>By the end of this theme, students will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Classify adrenergic and ganglion blockers and explain their mechanisms of action in relation to receptor physiology.</li> <li>2. Correlate the clinical uses and adverse effects of adrenergic blockers with their pharmacological actions in cardiovascular and systemic diseases.</li> <li>3. Interpret pharmacological responses in experimental models and relate them to autonomic receptor function.</li> <li>4. Explain Mendelian inheritance and chromosomal disorders and correlate genetic alterations with clinical manifestations.</li> <li>5. Describe the molecular mechanisms of carcinogenesis including oncogenes, tumor suppressor genes, and environmental carcinogens.</li> <li>6. Differentiate benign and malignant neoplasms based on morphology, genetics, and biological behavior.</li> <li>7. Explain epidemiological, genetic, and environmental risk factors involved in cancer development.</li> <li>8. Interpret pathological findings in nutritional disorders and relate nutrient imbalance to systemic disease.</li> <li>9. Describe postmortem changes and estimate time since death in relation to their medico-legal significance.</li> <li>10. Demonstrate principles of personal identification, forensic evidence handling, and empathetic communication in medico-legal situations.</li> </ol>

## SPECIFIC LEARNING OBJECTIVES

### Horizontally Integrated Basic Sciences (Pharmacology, Pathology & Forensic Medicine)

Code	Topic	Learning Objectives	Learning Domain	Calgary Gauge	Teaching Strategy	Assessment
<b>PHARMACOLOGY</b>						
M2-FM-III-PH-017	Alpha blocker	<ul style="list-style-type: none"> <li>Classify alpha adrenergic blockers</li> <li>Describe the mechanism of action, pharmacological effects, uses and adverse effects of <math>\alpha</math> – blockers.</li> <li>Discuss “epinephrine reversal”</li> </ul>	C2 C2 C2	Must Know Must Know Must Know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-018	Beta blocker-I	<ul style="list-style-type: none"> <li>Classify beta adrenergic blockers</li> <li>Describe the mechanism of action of beta-adrenergic blockers</li> <li>Describe the pharmacological effects of beta-adrenergic blockers</li> </ul>	C2 C2 C2	Must Know Must Know Must Know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-019	Beta blocker-II	<ul style="list-style-type: none"> <li>Describe the uses and adverse effects of beta blockers</li> </ul>	C2	Must Know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-020	Beta blocker	<ul style="list-style-type: none"> <li>Rationalize the use of specific beta blockers in specific clinical situations</li> <li>Discuss the clinical pharmacology of beta blockers</li> </ul>	C3 C2	Must Know Must Know	CBL	MCQ SAQ/SEQ VIVA
M2-FM-III-PH-021	Introduction to p-drug and prescription writing	<ul style="list-style-type: none"> <li>Identify the essential parts of a rational medical prescription.</li> <li>Explain the stepwise process of Personal Drug (P-drug) selection, based on the criteria of efficacy, safety, suitability, and cost.</li> </ul>	C2 C3	Must Know Must Know	SKILL	OSPE
M1-FM-PH-022	Ganglion blockers	<ul style="list-style-type: none"> <li>Enumerate Ganglion blockers</li> <li>Explain mechanism of action</li> <li>Discuss different organ system effects</li> <li>Enumerate clinical applications and toxicity of the drugs</li> </ul>	Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition, Chapter 8, Page 139-140			MCQS

PATHOLOGY						
M2-FM-III-PATH-013	Diagnostic approach of malignant tumors	<ul style="list-style-type: none"> <li>Diagnose a case of malignant tumor based on different laboratory tests</li> <li>Describe morphology of malignant tumors (gross &amp; microscopy)</li> <li>Demonstrate adequate interpersonal skills and collaborative teamwork</li> </ul>	C2 C2 A2	Must know Must know Need to know	LGIS	MCQs SAQs VIVA
M2-FM-III-PATH-014	Tumor suppressor genes in cancer	<ul style="list-style-type: none"> <li>Explain carcinogenesis by Tumor suppressor genes, RB gene</li> <li>P53 gene Explain role of ApC /b-catenin pathway in carcinogenesis</li> <li>Explain chemical, radiational and microbial carcinogenesis</li> </ul>	C2 C2 C2	Must know Must know Must know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PATH-015	Single gene disorders with atypical inheritance/ diagnosis of gene disorders	<ul style="list-style-type: none"> <li>Enlist major types of genetic disorders of A typical inheritance</li> <li>Diagnose A typical Inheritance from Clinical Scenarios</li> </ul>	C2 C3	Must know Must know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PATH-016	Chromosomal disorders	<ul style="list-style-type: none"> <li>Enlist various Chromosomal disorders</li> <li>Describe the mechanisms involved in Chromosomal disorders</li> </ul>	C2 C2	Must know Must know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-PATH-017	Types of gene disorders and Prenatal diagnosis	<ul style="list-style-type: none"> <li>Classify normal Karyotype</li> <li>Explain chromosomal disorders of autosomes and sex chromosomes</li> <li>Explain Down' syndrome and turner's syndrome</li> <li>Explain single gene disorders with non-classical inheritance.</li> <li>Explain multifactorial genetic disorders</li> <li>Identify diseases caused by triplet repeat mutation</li> <li>Identify diagnostic test related to genetic diseases</li> </ul>	C1 C2 C2 C2 C2 C2	Must know Must know Must know Must know Must know Must know	LGIS	MCQs SAQs VIVA
M2-FM-III-PATH-018	Mendelian Disorders	<ul style="list-style-type: none"> <li>Explain Mendelian's laws of genetics.</li> <li>Correlate inheritance with pathogenesis of various genetic disorders</li> </ul>	C2 C3	Must know Must know	LGIS	MCQ SAQ/SEQ VIVA

M2-FM-III- PATH-019	Carcinogenic agents and Tumor immunity  Molecular basis of cancer	<ul style="list-style-type: none"> <li>• Classify carcinogenesis based on mechanism involved</li> <li>• Describe the steps involved in carcinogenesis</li> <li>• Explain chemical, radiational and microbial carcinogenesis</li> <li>• Explain Immune surveillance</li> <li>• Explain Health Effects of Climate changes</li> <li>• Describe Toxicity of chemical and physical agents</li> <li>• Describe essential alterations for malignant transformation</li> <li>• Define oncogenes, proto-oncogenes and oncoproteins</li> <li>• Explain role of RAS oncogenes, BRAF, MYC oncogenes, Cyclin and cyclin dependent kinase in carcinogenesis</li> </ul>	C2 C2 C2 C1 C2 C2 C2 C2	Must know Must know Must know Nice to know Must know Must know Must know Must know	SGD	MCQ SAQ/SEQ VIVA
M2-FM-III- PATH-020	Diagnosis of Klinefelter Syndrome	<ul style="list-style-type: none"> <li>• Explain causes and evaluation of chromosomal abnormalities</li> <li>• Explain causes of facial features and complication of this syndrome</li> <li>• Correlate clinical features with genetic basis</li> <li>• Identify Chromosomal abnormalities based on history and physical examination</li> </ul>	C2 C2 C2 C2	Must know Must know Must know Must know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III- PATH-021	Pathophysiology of occupational diseases	<ul style="list-style-type: none"> <li>• Explain the pathophysiological mechanisms through which environmental agents (pollutants, chemicals, radiation, and heavy metals) cause cellular and tissue injury.</li> <li>• Apply the mechanisms of oxidative stress, inflammation, and cellular damage to describe how environmental exposure leads to disease.</li> <li>• Correlate common environmental exposures (e.g., air pollution, asbestos, lead, radiation) with their major pathological effects in different organs.</li> <li>• Analyze the progression from environmental exposure to cellular injury and development of environmental diseases.</li> </ul>	C2  C3  C3	Must know  Must know  Must know  Must know	LGIS	MCQ SAQ/SEQ VIVA

			C4			
M-III-FM-PATH-022	Disorders of Vitamin Metabolism	<ul style="list-style-type: none"> <li>Explain pathophysiology of Vitamin D deficiency and excess</li> <li>Differentiate clinical and biochemical features of major Vitamin D disorders</li> <li>Apply diagnostic and management principles in Vitamin D-related diseases</li> </ul>	C2 C3 C3	Must know Must know Must know	SGD	MCQ SAQ/SEQ VIVA
M2-FM-III-PATH-023	Diagnosis of malignant Neoplasia	<ul style="list-style-type: none"> <li>Identify the microscopic features and gross appearance of Chronic and Granulomatous Inflammation</li> <li>Value the role of basic investigations in clinical management</li> </ul>	P1 A3	Must know Need to know	SKILL	OSPE
M2-FM-III-PATH-024	Nutritional disorder Macronutrients/Micronutrient insufficiency  Environmental pollution	<ul style="list-style-type: none"> <li>Explain Macro/Micro-nutrient insufficiency</li> <li>Explain Dietary insufficiency, Protein energy Malnutrition, Anorexia Nervosa and Bulimia, Vitamin Deficiency,</li> <li>Obesity, Diets, Cancers and Atherosclerosis.</li> <li>Demonstrate understanding of teamwork in diagnosing a patient with multiple health issues</li> <li>Outline salient features of environmental pollution in an article.</li> <li>Demonstrate responsible behavior towards self-learning</li> </ul>	Robbins & Cotran Pathologic Basis OF Disease 10th Edition Chapter 3 Pg 80—85  Robbins & COTRAN Pathologic Basis OF Disease, 10th Edition, Chapter 1, Pg 302--307			LMS based MCQs
<b>FORENSIC MEDICINE</b>						
M2-FM-III-F-011	Thanatology- III (Late changes of Death Putrefaction)	<ul style="list-style-type: none"> <li>Enlist the bacteria participates in putrefaction</li> <li>Briefly describe the features of putrefaction and its mechanism</li> <li>State the medicolegal importance of maggots.</li> </ul>	C1 C2 C3	Must know Must know Need to know	LGIS	MCQ SAQ/SEQ VIVA

M2-FM-III-F-012	Thanatology- IV (Adipocere, Mummification & Estimation of time since death)	Define Adipocere and state its medicolegal importance. Define mummification and state its medicolegal importance. Briefly describe the method to calculate the time since death. Enumerate different changes after death which helps to calculate the time since death.	C2 C2 C3 C2	Must know Must know Must know Must know	LGIS	MCQ SAQ/SEQ VIVA
M2-FM-III-F-013	Examination of Seminal Stain	<ul style="list-style-type: none"> <li>State the medicolegal importance of biological specimens (Blood)</li> <li>Briefly describe the method to Collect, preserve and dispatch various human body specimens</li> </ul>	C2 C2	Must know Must know	SKILL	OSPE
M2-FM-III-F-014	<p>Thanatology</p> <p>Types of death Immediate &amp; Early changes of death Trace evidence</p> <p>Thanatology</p> <p>Putrefaction, Adipocere Mummification Estimation of time since death</p>	<ul style="list-style-type: none"> <li>Define death and classify its types</li> <li>State the WHO criteria &amp; indicators to diagnose death.</li> <li>Briefly describe the causes, manner, mode, mechanisms, medico legal aspects of death</li> <li>Define Algor mortis and state its medico-legal importance</li> <li>Briefly explain the method to measure the temperature of body after death.</li> <li>Enlist various factors affecting algor mortis.</li> <li>Briefly describe postmortem calorificity.</li> <li>State the medicolegal importance of biological specimens (Blood)</li> <li>Briefly describe the method to Collect, preserve and dispatch various human body specimens</li> </ul> <ul style="list-style-type: none"> <li>Define Adipocere and state its medicolegal importance.</li> <li>Define mummification and state its medicolegal importance</li> <li>Briefly describe the method to calculate the time since death.</li> <li>Enumerate different changes after death which helps to calculate the time since death.</li> </ul>	Essential: Parikhs’’textbook of forensic and toxicology  Recommended: Principles of Forensic Medicine & Toxicology by Gautam Biswas  Essential:Parikhs’’text book of forensic and toxicology  Recommended: Principles of Forensic Medicine & Toxicology by Gautam Biswas			
<b>CLINICAL SCIENCES</b>						

SURGERY						
M2-FMIII-VI(S)-005	Initial management of trauma	<ul style="list-style-type: none"> <li>• Explain timeline concept in trauma management</li> <li>• Select early total care and damage control strategies</li> <li>• Identify and assess severely injured patient</li> <li>• Explain primary survey and secondary survey concepts</li> </ul>	C2 C3 C3 C2	Nice to Know Nice to Know Should know Should know	LGIS	MCQs SAQs
SPIRAL COURSES						
BEHAVIORAL SCIENCES						
M2-FMIII-SI(BS)-005	Crisis intervention conflict resolution empathy	<ul style="list-style-type: none"> <li>• Students should comprehend the nature of crisis including the different types of crises.</li> <li>• Assess crisis situations effectively including identifying signs and symptoms of crisis</li> <li>• Student should learn various techniques for deescalating crisis situations</li> </ul>	C3  C3  C3	Must know  Must know  Must know	LGIS	MCQs SEQs SAQs Standard matching
M2-FMIII-SI(BS)-006	<b>Psychosocial Aspect in different hospital settings</b>  Pediatrics Ward	<p>The students should be able to</p> <ul style="list-style-type: none"> <li>• Understand the unique psychosocial needs of pediatric patients, their families, and caregivers in the hospital setting.</li> <li>• Develop skills in communicating effectively with children and their families about medical procedures, diagnoses, and treatment plans.</li> <li>• Implement strategies to support children and families coping with hospitalization, illness, and treatment-related stressors, including play therapy, distraction techniques, and family-centered care approaches.</li> <li>• Collaborate with pediatric healthcare teams to address psychosocial factors impacting child health outcomes, such as parental stress, sibling adjustment, and developmental needs.</li> <li>• Advocate for child-friendly healthcare environments, age-appropriate communication, and holistic psychosocial support services in pediatric care settings.</li> </ul>	Behavioral Sciences textbook, second edition by Mowadat Rana			

Integrated Undergraduate Research Curriculum (IUGRC)						
M2-FMIII-SI(IUGRC)-002	<b>Inferential Statistics 5</b>	<ul style="list-style-type: none"> <li>Explain principles of correlation analysis for comparing two continuous variables in same subjects in given data set</li> <li>Explain with examples concept of correlation and association in research data</li> <li>Compute co efficient of correlation and interpret results</li> </ul>	C1	Must know	LGIS	MCQs
			C1	Must know		
			C3	Must know		

### Syllabus Learning Management System (LMS)

Schedule Wks	Topics of LGIS &SGD*	Topics Of SDL	Learning Objectives of SDL	Learning resources	Mode of assessment
<b>PHARMACOLOGY</b>					
Wk. 3	<ul style="list-style-type: none"> <li>Beta blocker-I</li> <li>Beta blocker-II</li> <li>Beta blocker-III</li> <li>Alpha blocker</li> </ul>	Ganglion blockers	<ul style="list-style-type: none"> <li>Enumerate Ganglion blockers</li> <li>Explain mechanism of action</li> <li>Discuss different organ system effects</li> <li>Enumerate clinical applications and toxicity of the drugs</li> </ul>	Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition, Chapter 8, Page 139-140  Kirkpatrick K, Khan MH, Deng Y, Shah KB, Khan M, Shah K. A review of stellate ganglion block as an adjunctive treatment modality. Cureus. 2023 Feb 19;15(2).	LMS Based MCQS
<b>PATHOLOGY</b>					
	<ul style="list-style-type: none"> <li>Nomenclature of tumors</li> <li>Single gene disorders with atypical inheritance/ diagnosis of gene disorders</li> </ul>	Nutritional disorder Macronutrients/Micronutrient insufficiency	<ul style="list-style-type: none"> <li>Explain Macro/Micro-nutrient insufficiency</li> <li>Explain Dietary insufficiency, Protein energy Malnutrition, Anorexia Nervosa and Bulimia, Vitamin Deficiency,</li> <li>Obesity, Diets, Cancers and Atherosclerosis.</li> </ul>	Robbins & Cotran Pathologic Basis OF Disease 10th Edition Chapter 3 Pg 80—85	LMS Based MCQS

	<ul style="list-style-type: none"> <li>• Tumor suppressor genes in cancer</li> <li>• Chromosomal disorders</li> <li>• Diagnosis of Klinefelter Syndrome</li> <li>• Molecular basis of cancer</li> <li>• Mendelian Disorders</li> <li>• Carcinogenic agents and Tumor immunity</li> <li>• Disorders of Vitamin Metabolism</li> <li>• Pathophysiology of occupational diseases</li> </ul>	Environmental pollution	<ul style="list-style-type: none"> <li>• Demonstrate understanding of team work in diagnosing a patient with multiple health issues</li> <li>• Outline salient features of environmental pollution in an article.</li> <li>• Demonstrate responsible behavior towards self-learning</li> </ul>	Robbins & COTRAN Pathologic Basis OF Disease, 10th Edition, Chapter 1, Pg 302-- 307	
<b>FORENSIC MEDICINE</b>					
	<ul style="list-style-type: none"> <li>• <b>Thanatology- III</b> (Late changes of Death Putrefaction)</li> <li>• <b>Thanatology- IV</b> (Adipocere, Mummification &amp; Estimation of time since death)</li> <li>• <b>Examination of Seminal Stain</b></li> </ul>	<p><b>Thanatology</b></p> <p>Types of death</p> <p>Immediate &amp; Early changes of death</p> <p><b>Trace evidence</b></p>  <p><b>Thanatology</b></p> <p>Putrefaction, Adipocere Mummification Estimation of time</p>	<ul style="list-style-type: none"> <li>• Define death and classify its types</li> <li>• State the WHO criteria &amp; indicators to diagnose death.</li> <li>• Briefly describe the causes, manner, mode, mechanisms, medico legal aspects of death</li> <li>• Define Algor mortis and state its medicolegal importance</li> <li>• Briefly explain the method to measure the temperature of body after death.</li> <li>• Enlist various factors affecting algor mortis.</li> <li>• Briefly describe postmortem calorificity.</li> </ul> <p>State the medicolegal importance of</p> <ul style="list-style-type: none"> <li>• Biological specimens (Blood)</li> <li>• Briefly describe the method to Collect, preserve and dispatch various human body specimens</li> <li>• Define Adipocere and state its medicolegal importance.</li> <li>• Define mummification and state its medicolegal importance</li> </ul>	<p><b>Essential:</b> Parikhs" text book of forensic and toxicology</p> <p><b>Recommended:</b> Principles of Forensic Medicine &amp; Toxicology by Gautam Biswa</p>	LMS Based MCQS

		since death	<ul style="list-style-type: none"> <li>Briefly describe the method to calculate the time since death.</li> <li>Enumerate different changes after death which helps to calculate the time since death</li> </ul>		
<b>BEHAVIORAL SCIENCES</b>					
	<ul style="list-style-type: none"> <li>Crisis intervention and conflict resolution</li> </ul>	<ul style="list-style-type: none"> <li>Psychosocial Aspect in different hospital settings pediatric ward</li> </ul>	<p>The students should be able to</p> <ul style="list-style-type: none"> <li>Understand the unique psychosocial needs of pediatric patients, their families, and caregivers in the hospital setting.</li> <li>Develop skills in communicating effectively with children and their families about medical procedures, diagnoses, and treatment plans.</li> <li>Implement strategies to support children and families coping with hospitalization, illness, and treatment-related stressors, including play therapy, distraction techniques, and family-centered care approaches.</li> <li>Collaborate with pediatric healthcare teams to address psychosocial factors impacting child health outcomes, such as parental stress, sibling adjustment, and developmental needs.</li> <li>Advocate for child-friendly healthcare environments, age-appropriate communication, and holistic psychosocial support services in pediatric care settings</li> </ul>	Behavioral Sciences textbook, second edition by Mowadat Rana	LMS Based MCQS

**Distribution of Teaching Hours of Disciplines**

Sr. No.	Disciplines	LGIS	SGD	CBL	SDL	Hours
1.	Pharmacology	11	00	05	03	19
2.	Pathology	10	05	03	03	21
3.	Forensic Medicine	08	0	0	03	11
4.	Surgery	05	0	0	0	05
5.	Medicine	02	0	0	0	02
6.	Family Medicine	01	0	0	0	01
7.	Research	02	0	0	0	02
9.	Behavioral Sciences	03	0	0	03	06
	Total hours	42	05	08	12	<b>67</b>

**Practical & Clerkship Hours**

Disciplines	Practical hours	Disciplines	Clerkship hours
Pharmacology	2x3= 06 hrs	Surgery	2.5 x 12 = 30 hrs
Pathology	2x3 = 06 hrs	Medicine	2.5 x 12= 30 hrs
Forensic Medicine	2x3= 06hrs	Subspecialty	2.5 x 12=30 hrs

**RMU – 12 Integrated Modular MBBS Curriculum 2026**

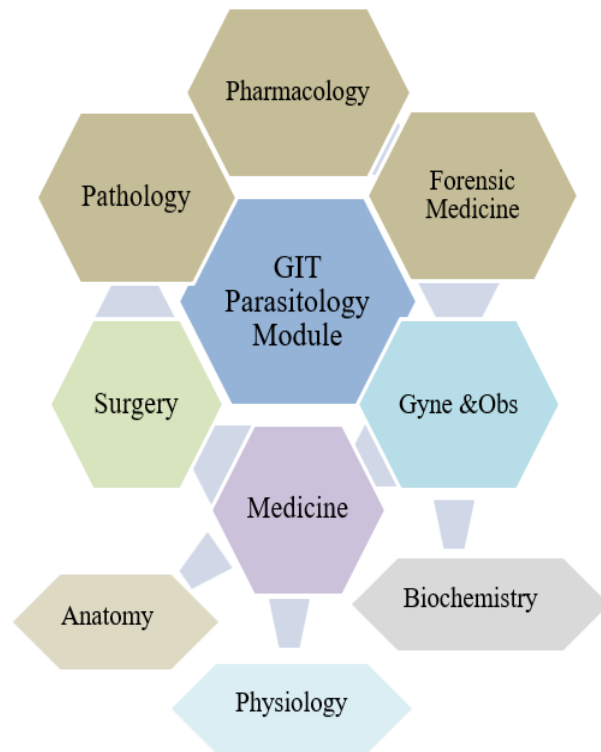
**Isolation to Beyond Boundaries**

**3rd Year MBBS 2026**

**Study Guide**

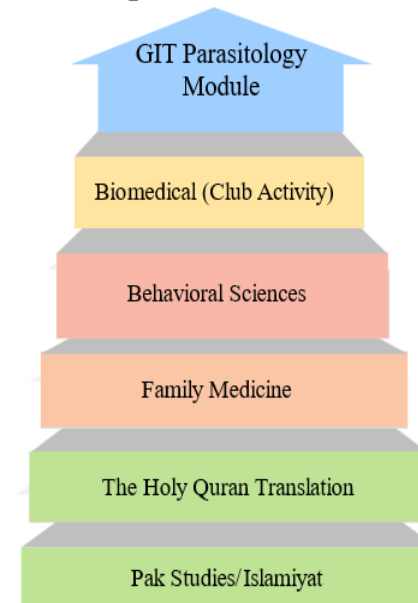
**GIT, Hepatobiliary Parasitology-II**

## INTEGRATION OF DISCIPLINES IN GIT & PARASITOLOGY MODULE



**Disciplines in GIT, Hepatobiliary & Parasitology-II**

### Spiral Courses



**Spiral / General Education Cluster Courses (5%)**

## Discipline Wise Details of Modular Content

BLOCK	MODULE	CONTENT
	<ul style="list-style-type: none"> <li>Pharmacology</li> </ul>	<ul style="list-style-type: none"> <li>Drugs used in Peptic Ulcer</li> <li>Anti-emetics</li> <li>Anti-amoebic</li> <li>Antiprotozoal</li> <li>Anti-diarrheal</li> </ul>
	<ul style="list-style-type: none"> <li>Pathology</li> </ul>	<ul style="list-style-type: none"> <li>Upper GI and gastric pathology</li> <li>Intestinal pathology</li> <li>Hepatobiliary pathology</li> <li>Parasitology</li> </ul>
	<ul style="list-style-type: none"> <li>Forensic Medicine</li> </ul>	<ul style="list-style-type: none"> <li>General Toxicology</li> <li>Medicolegal Autopsy</li> </ul>
<b>SPIRAL COMPONENT</b>		
	<ul style="list-style-type: none"> <li>Family Medicine</li> </ul>	<ul style="list-style-type: none"> <li>GI and hepatobiliary disorders</li> </ul>
	<ul style="list-style-type: none"> <li>Research Innovation (IUGR)</li> </ul>	<ul style="list-style-type: none"> <li>Synopsis and manuscript writing</li> <li>Questionnaire development</li> <li>Data analysis</li> </ul>
	<ul style="list-style-type: none"> <li>Behavioral Sciences</li> </ul>	<ul style="list-style-type: none"> <li>Counselling and breaking bad news</li> </ul>
<b>VERTICAL COMPONENT</b>		
	<ul style="list-style-type: none"> <li>Medicine</li> </ul>	<ul style="list-style-type: none"> <li>Approach to patients with GI symptoms</li> </ul>
	<ul style="list-style-type: none"> <li>Surgery</li> </ul>	<ul style="list-style-type: none"> <li>Sign and symptoms treatment and approach to patients with GI and hepatobiliary diseases</li> </ul>
	<ul style="list-style-type: none"> <li>Community medicine</li> </ul>	<ul style="list-style-type: none"> <li>Nutrition</li> <li>Feco oral infections</li> </ul>
	<ul style="list-style-type: none"> <li>Gynecology and OBS</li> </ul>	<ul style="list-style-type: none"> <li>Hyperemesis gravidarum</li> </ul>

### GIT & Parasitology Module Team

Module Name	:	GIT & Parasitology Module
Duration of module	:	05 Weeks
Coordinator	:	Dr.Fatima Tuz Zahra
Co-coordinator	:	Dr Rubab
Review by	:	Module Committee

MODULE COMMITTEE			MODULE TASK FORCE TEAM		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Mudassira Zahid (Associate Professor of Pathology)
2.	Director DME	Prof. Dr. Ifra Saeed	2.	DME Focal Person	Dr. Maryum Batool
3.	Convener Curriculum	Prof. Dr. Naeem Akhter	3.	Co-coordinator	Dr Rubab
4.	Dean Basic Sciences	Prof. Dr. Ayesha Yousaf			
5.	Additional Director DME	Dr. Omaira Asif			
6.	Chairperson Pharmacology	Dr. Zunera Hakim			
7.	Chairperson Pathology	Dr Fatima Tuz Zahra	<b>DME IMPLEMENTATION TEAM</b>		
8.	Chairperson Forensic Medicine	Dr. Filza Moin	1.	Director DME	Prof. Dr. Ifra Saeed
9.	Focal Person Pathology	Dr. Rubab	2.	Implementation In charge 3 <sup>rd</sup> Year MBBS	Dr. Zunera Hakim
10.	Focal Parson Pharmacology	Dr Uzma Umar	3.	Assistant Director DME	Omaira Asif
11.	Focal Person Forensic Medicine	Dr. Shahida	4.	Editor	Omaira Asif
12.	Focal Person Medicine	Dr Sadia			
13.	Focal Person Surgery	Dr Asifa Dayan			
14.	Focal Person Behavioral Sciences	Dr. Saadia Yasir			
15.	Focal Person Community Medicine	Dr. Afifa Kalsoom			
16.	Focal Person Quran Translation Lectures	Dr. Uzma Zafar			
17.	HoD Family Medicine	Dr. Sadia Azam Khan			

## **GIT, Hepatobiliary & Parasitology-II**

### **Introduction**

The Gastrointestinal Tract (GIT), Hepatobiliary & Parasitology-II Module is a theme-based integrated module designed to provide a coherent understanding of the normal and diseased states of the gastrointestinal and hepatobiliary systems, along with parasitic diseases relevant to this system.

This module integrates core concepts of basic sciences—including Pharmacology, Pathology, Forensic Medicine, Community Medicine, Research, and Behavioral Sciences—with their clinical application in Medicine, Surgery, and Family Medicine. The thematic integration enables students to develop critical thinking, facilitating the application of foundational knowledge to real-world clinical scenarios.

### **Rationale**

This module is structured around the theme of Gastrointestinal and Hepatobiliary Disorders, emphasizing horizontal and vertical integration across disciplines. It is designed to impart essential knowledge in Pharmacology, Pathology, Forensic Medicine, Community Medicine, Research Methodology, Medicine, and Surgery, ensuring continuity between basic sciences and clinical practice.

The acquired knowledge will enable students to:

- Understand the etiology, pathogenesis, and prevention of gastrointestinal, hepatobiliary, and parasitic diseases
- Apply principles of pharmacotherapy and disease management
- Appreciate the public health, ethical, medico-legal, and research dimensions of patient care

This theme-based approach ensures that learning is contextual, clinically relevant, and patient-centered.

### **Module Outcomes**

At the completion of this module, each student will be able to achieve the following outcomes across the Knowledge, Skills, and Attitude domains:

#### **Knowledge**

Students will be able to:

- Acquire and apply basic terminologies and concepts in Pharmacology, Pathology, and Forensic Medicine related to GIT, hepatobiliary, and parasitic diseases
- Understand disease patterns within the community context, including nutrition and feco-oral transmission
- Utilize technology-based medical education, including Artificial Intelligence and digital learning platforms

## GIT, Hepatobiliary & Parasitology Module II

### Duration: 6 Weeks

SR	Theme	Subthemes	Duration
1	Upper GIT Disorders & Vomiting with Basic Toxicology	Subtheme 1: Upper Gastrointestinal Disorders & Clinical Correlation Subtheme 2: Vomiting Mechanisms, Antiemetics & Basic Toxicology	1st Week
2	Lower Gastrointestinal Disorders, Diarrhea & Inflammatory Bowel Disease (IBD)	Subtheme 1: Lower Gastrointestinal Pathologies & Acute Abdomen Subtheme 2: Diarrhea, IBD & Pharmacological/Nutritional Management	2nd Week
3	Lower GI Dynamics: Motility, Malabsorption & Parasitic Insights	Subtheme 1: Colorectal Pathologies, Malignancy & Diagnostic Approaches Subtheme 2: Gut Motility, Parasitic Infections & Therapeutic Interventions	3rd Week
4	Parasitic & Infectious Disorders of the Gastrointestinal Tract	Subtheme 1: Infectious & Parasitic GI Disorders with Epidemiology Subtheme 2: Therapeutics, Pancreatic Involvement & Research Integration	4th Week
5	Parasitic and Viral Hepatic Disorders	Subtheme 1: Parasitic Infections & Hepatic Pathology Subtheme 2: Pharmacological Management, Clinical Approach & Research Integration	5th Week
6	Hepatobiliary Disorders and Viral Hepatitis Management	Subtheme 1: Hepatobiliary Pathologies & Clinical Evaluation Subtheme 2: Viral Hepatitis Management, Pharmacology & Prevention	6th Week

## WEEK 1

Theme	Week	Rationale	Learning Outcomes (LOs)
<b>Upper GIT Disorders &amp; Vomiting with Basic Toxicology</b>	Week 1	This week focuses on foundational understanding of upper gastrointestinal tract disorders including esophageal and gastric pathologies, along with mechanisms and management of vomiting. It also introduces basic principles of toxicology and poisoning, which are essential for early clinical exposure and emergency management. Integration of pharmacology (antiemetics), pathology (neoplastic and non-neoplastic lesions), and clinical subjects (medicine, surgery) helps build a comprehensive approach.	<ul style="list-style-type: none"> <li>• Describe the anatomy and common disorders of oral cavity, esophagus, and stomach.</li> <li>• Explain pathogenesis and features of esophagitis, peptic ulcer disease, and GI malignancies.</li> <li>• Recognize clinical presentation and approach to upper GI bleeding.</li> <li>• Understand mechanisms, causes, and management of vomiting.</li> <li>• Classify antiemetic drugs with their mechanisms and uses.</li> <li>• Explain principles of dose-response relationship.</li> <li>• Describe general management and clinical features of common poisoning.</li> <li>• Understand basics of GI investigations and nutritional aspects related to upper GIT.</li> </ul>
<b>Subtheme 1: Upper Gastrointestinal Disorders &amp; Clinical Correlation</b>			<ul style="list-style-type: none"> <li><input type="checkbox"/> Describe detailed anatomy and physiology of oral cavity, esophagus, and stomach.</li> <li><input type="checkbox"/> Explain pathogenesis, morphology, and clinical features of esophagitis and peptic ulcer disease.</li> <li><input type="checkbox"/> Differentiate between benign and malignant lesions of upper GIT.</li> <li><input type="checkbox"/> Recognize risk factors, presentation, and complications of gastric and esophageal malignancies.</li> <li><input type="checkbox"/> Develop clinical approach to upper GI bleeding (hematemesis, melena).</li> <li><input type="checkbox"/> Interpret basic diagnostic tools (endoscopy, biopsy, barium studies).</li> <li><input type="checkbox"/> Correlate nutritional factors with upper GIT disorders (e.g., H. pylori, diet, deficiencies).</li> </ul>
<b>Subtheme 2: Vomiting Mechanisms, Antiemetics &amp; Basic Toxicology</b>			<ul style="list-style-type: none"> <li><input type="checkbox"/> Explain physiology and neural pathways involved in vomiting (CTZ, vomiting center).</li> <li><input type="checkbox"/> Identify common causes of vomiting (infectious, metabolic, drug-induced, CNS-related).</li> <li><input type="checkbox"/> Classify antiemetic drugs (e.g., 5-HT<sub>3</sub> antagonists, D<sub>2</sub> blockers, antihistamines) with mechanisms and clinical uses.</li> <li><input type="checkbox"/> Apply rational selection of antiemetics in different clinical scenarios (pregnancy, chemotherapy, motion sickness).</li> <li><input type="checkbox"/> Describe principles of dose-response relationship and therapeutic index.</li> <li><input type="checkbox"/> Define poisoning and classify common toxic agents (drugs, chemicals, food toxins).</li> <li><input type="checkbox"/> Outline general management of poisoning (ABC approach, decontamination, antidotes).</li> <li><input type="checkbox"/> Recognize early clinical features of common poisonings relevant to practice.</li> </ul>

## Specific Learning Objectives – WEEK 1

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
M-III-GIT-PATH-001	Non neoplastic lesions of esophagus	<ul style="list-style-type: none"> <li>Describe the types of esophagitis</li> <li>Describe the morphology and pathogenesis of different types of esophagitis.</li> </ul>	C2 C2	Need to know Must know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-002	Neoplastic lesions of esophagus	<ul style="list-style-type: none"> <li>Describe etiology, pathogenesis and morphological features of Reflux Esophagitis, Esophageal Varices, Barrett's Esophagus.</li> <li>enlist the risk factors for carcinoma of esophagus.</li> <li>Classify different types of esophageal tumors on the basis of morphology.</li> <li>correlate the pathogenesis of Barrett's esophagitis with GERD</li> </ul>	C2 C2 C3 C3	Must know Must know Need to know Need to know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-017	Oral Cavity & Salivary Gland diseases	<ul style="list-style-type: none"> <li>Describe Causes and pathological features of Inflammatory/ reactive Lesions of oral cavity.</li> <li>Explain oral Manifestations of Systemic Disease with examples.</li> <li>Explain causes and pathogenesis of Precancerous and Cancerous Lesion.</li> <li>Discuss epidemiology, pathogenesis morphology of Squamous Cell Carcinoma.</li> <li>Classify salivary gland non neoplastic lesions.</li> <li>Discuss Xerostomia and Sialadenitis.</li> </ul>	C2 C2 C2 C2 C2 C2	Need to know Need to know Need to know Nice to know Nice to know Nice to know	SGD	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-031	Salivary tumor, CA esophagus, peptic ulcer, CA	<ul style="list-style-type: none"> <li>Recognize and draw histopathological features of pleomorphic adenoma of parotid gland.</li> <li>Describe the pathological features of gastric ulcers and carcinoma of esophagus and stomach.               <ul style="list-style-type: none"> <li>Identify the slides and recognize two points of</li> </ul> </li> </ul>	C2 C2 P3	Must know Need to know Need to know Need to know Must know	PRACTICAL	OSPE

	stomach	identification of pleomorphic adenoma, CA stomach and CA esophagus.		Must know		
<b>PHARMACOLOGY</b>						
MIII-GIT-PH-001	Antiemetic drugs	<ul style="list-style-type: none"> <li>Describe the uses &amp; adverse effects of metoclopramide.</li> <li>Describe mechanism of action and adverse effects of other anti-emetics (5HT3 antagonists, H1 antagonists &amp; hyoscine).</li> </ul>	C2 C2	MUST KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
MIII-GIT-PH-017	Chemotherapy induced nausea and vomiting	<ul style="list-style-type: none"> <li>Describe the pathophysiology of chemotherapy-induced nausea and vomiting (CINV), including the role of neurotransmitters such as serotonin, dopamine, and substance P.</li> <li>Recognize the different phases of CINV (acute, delayed and anticipatory) and their clinical implications.</li> <li>Discuss the principles of pharmacological management of CINV, including the use of antiemetic medications such as 5-HT3 receptor antagonists, NK1 receptor antagonists, corticosteroids, and dopamine receptor antagonists.</li> <li>Discuss the importance of patient education and proactive management strategies to prevent and minimize CINV throughout the course of chemotherapy treatment.</li> </ul>	C2 C2 C2	MUST KNOW	CBL	MCQs SAQs SEQs EMQ VIVA
MIII-GIT-PH-013	Demonstration of dose response relationship using rabbit ileum	<ul style="list-style-type: none"> <li>Identification of all the parts of kymograph</li> <li>Demonstrate the effects of gradually increasing doses of acetylcholine on dose response curve.</li> </ul>	P1 P3	Should know	PRACTICAL	OSPE
<b>FORENSIC MEDICINE</b>						

<b>MIII-GIT-FM-001</b>	<b>General Toxicology-II</b>	<ul style="list-style-type: none"> <li>Enlist different sign and symptoms of poisoning</li> <li>Briefly describe the diagnostic criteria of poisoning both in living and dead.</li> <li>Define an antidote and Classify antidotes</li> <li>Describe the uses of various antidotes in respective poisoning.</li> </ul> State the composition of a universal antidote and its uses	C2 C2 C1 C2 C2	MUST KNOW MUST KNOW MUST KNOW SHOULD KNOW MUST KNOW	<b>LGIS</b>	MCQs SAQs SEQs EMQ VIVA
<b>MIII-GIT-FM-005</b>	<b>General Management Of poisoning</b>	<ul style="list-style-type: none"> <li>Enlist the steps of management of a case of poisoning</li> <li>Describe the role of elimination of unabsorbed poison</li> <li>Brief description of procedure of gastric lavage along with its indications, contraindications and complication</li> </ul>	C1 C2 C2 C2	SHOULD KNOW MUST KNOW	SGD (Practical)	MCQs SAQs SEQs EMQ VI VA OSPE
<b>SURGERY</b>						
	Approach to a patient with Esophageal Disease	<ul style="list-style-type: none"> <li>Outline differential diagnosis of dysphagia</li> <li>Describe different types of Motility disorders of esophagus.</li> <li>Explain clinical features, diagnosis, treatment and complications associated with GERD.</li> <li>Describe pathophysiology, diagnosis and treatment options for different benign causes of dysphagia</li> <li>Describe pathophysiology, diagnosis and treatment options for carcinoma esophagus.</li> </ul>	C2 C2 C3 C2 C2		<b>LGIS</b>	SEQs, MCQs, OSPE
<b>MEDICINE</b>						
	Introduction, symptoms and analysis of GI	<ul style="list-style-type: none"> <li>Define this condition and Discuss epidemiology and risk factors associated with this condition )</li> <li>Discuss relevant qualifications in history of</li> </ul>	C2 A 3		<b>LGIS/PPT/Case Vignette</b>	SEQs, MCQs, OSPE

	investigations	common presentations in Gastroenterology Describe important investigations e.g. endoscopy) in Gastroenterology and their indications and interpretation of results				
	Approach to a patient with upper GI bleed	<ul style="list-style-type: none"> <li>Should know the definition of hematemesis, Malena and hematochezia.</li> <li>Describe anatomical basis and patho-physiological correlation of GI bleed e.g. potential bleeding areas and mechanism of bleeding from the gut.</li> </ul> Discuss common causes of GI bleeding including common life	C2 A 3		<b>LGIS/PPT</b>	SEQS, MCQs, OSPE
<b>GYNAE/OBS</b>						
	Hyperemesis Gravidarum	<ul style="list-style-type: none"> <li>Define Hyperemesis Gravidarum and list its risk factors and clinical features.</li> <li>Apply clinical reasoning to diagnose and formulate a management plan for a patient with Hyperemesis Gravidarum.</li> </ul>	C2 C2		<b>LGIS</b>	SEQS, MCQs, OSPE
<b>COMMUNITY MEDICINE</b>						
<b>MIH-GIT-CM-001</b>	Public Health Nutrition and Upper Gastrointestinal Function	<ul style="list-style-type: none"> <li>Define key concepts of public health nutrition and describe the functions of the upper gastrointestinal tract.</li> <li>Explain the role of nutrition in maintaining upper GI health and preventing common disorders.</li> <li>Identify risk factors and clinical features of common upper GI disorders related to nutritional deficiencies.</li> <li>Apply principles of dietary management in patients with upper GI conditions.</li> <li>Analyze the impact of community-based nutritional interventions on upper GI health</li> </ul>	C1 C2 C3 C3 C3	MUST KNOW	LGIS	MCQs

		outcomes.				
<b>MIII-GIT - CM-002</b>	Micronutrients, Malabsorption Syndromes, and Nutritional Deficiency Disorders	<ul style="list-style-type: none"> <li>Define micronutrients and describe their physiological roles in the body.</li> <li>Explain the pathophysiology and causes of common malabsorption syndromes.</li> <li>Identify clinical features and complications of major nutritional deficiency disorders.</li> <li>Correlate specific micronutrient deficiencies with their associated diseases.</li> <li>Apply principles of diagnosis and nutritional management in patients with malabsorption and deficiency states.</li> </ul>	C2 C2 C2 C2 C2	MUST KNOW	LGIS	MCQs
<b>BEHAVIOURAL SCIENCE</b>						

## Clinico Connect (Transdisciplinary Clinical–Reasoning Forum -TCRF)-01

### Theme 1

#### Theme: Upper GIT Disorders & Vomiting with Basic Toxicology

Theme	Week	Topic	Clinical Case Scenario
Theme 1	Week 1	Upper GIT Disorders, Vomiting & Toxicological Risk	A female presents to the emergency department with recurrent vomiting for the past 3 days, associated with upper abdominal discomfort and mild dysphagia.

#### “When the Stomach Upsets: A Case of Recurrent Vomiting, Upper GI Pathology, and Early Toxicological Risk”

##### Clinical Scenario

A 35-year female presents to the emergency department with recurrent vomiting for the past 3 days, associated with upper abdominal discomfort and mild dysphagia. She reports occasional heartburn and a history of NSAID use. She ate street food 2 days ago and suspects food poisoning. There is no history of fever, jaundice, hematemesis, or melena.

##### Clinical Examination:

- Vitals: BP 110/70 mmHg, Pulse 92/min, Respiratory Rate 18/min
- Abdominal exam: Mild epigastric tenderness, no guarding or rigidity
- Oral cavity: Mild dental erosion, no lesions
- Hydration: Slightly reduced skin turgor

##### Laboratory & Initial Investigations:

- CBC: Mild leukocytosis
- Serum electrolytes: Mild hypokalemia
- Liver function tests: Normal
- Stool occult blood: Negative
- Urine output: Normal

##### Student Task (Problem-Based Trigger)

Students are asked to:

1. Describe the anatomy and common disorders of oral cavity, esophagus, and stomach.
2. Explain pathogenesis and features of esophagitis, peptic ulcer disease, and GI malignancies.
3. Recognize clinical presentation and approach to upper GI bleeding.
4. Understand mechanisms, causes, and management of vomiting.
5. Classify antiemetic drugs with their mechanisms and uses.

6. Explain principles of dose-response relationship.
7. Describe general management and clinical features of common poisoning.
8. Understand basics of GI investigations and nutritional aspects related to upper GIT.
- 9.

### **Students Integrate (Implicitly)**

Students implicitly integrate knowledge from:

- **Pharmacology:** Mechanism, classification, and indication of antiemetics; dose-response principles
- **Pathology:** Esophagitis, peptic ulcer disease, gastric neoplasms; cellular responses to injury
- **Medicine:** Clinical assessment of vomiting, dehydration, electrolyte imbalance, and upper GI bleeding
- **Surgery:** Endoscopic or surgical intervention in complicated upper GI disorders
- **Behavioral Sciences:** Patient counseling, diet modification, lifestyle advice
- **Community Medicine:** Food safety, prevention of food poisoning, public health strategies

### **What Makes This Harden's Integration Level 11?**

This scenario is Harden Level 11 because safe patient management depends on real-time integration of pharmacological, pathological, clinical, ethical, and public-health reasoning, with no discipline functioning independently. Students are required to think beyond isolated subjects and apply knowledge in a unified clinical context.

### **Teaching Format**

- Small group problem-based learning with facilitator guidance
- Case-based discussion and clinical reasoning exercises
- Simulation of antiemetic selection and fluid management
- Interpretation of laboratory findings
- Role-play on patient counseling and dietary modification

### **Competency Assessment:**

- Clinical reasoning
- Rational drug selection
- Interpretation of investigations
- Communication and counseling skills

### **Academic Justification Statement**

This theme integrates upper gastrointestinal disorders, vomiting mechanisms, pharmacological principles, and basic toxicology within a clinically relevant framework. By embedding foundational knowledge into a real patient scenario, learners develop the ability to synthesize diagnostic reasoning, therapeutic planning, and preventive strategies, ensuring holistic and safe patient care.

### **Subject Contribution in Clinico Connect -TCRF Session 1**

<b>Subject / Discipline</b>	<b>Nature of Contribution</b>	<b>Approx. Integration Weight (%)</b>	<b>Rationale</b>
Pharmacology	Antiemetics, dose-response, drug mechanisms	20%	Rational therapy
Pathology	Esophagitis, PUD, gastric pathology	25%	Disease understanding
Medicine	Clinical assessment, vomiting, dehydration	20%	Clinical context
Surgery	Endoscopic management, complications	10%	Practical application
Behavioral Sciences	Counseling, lifestyle modification	10%	Patient-centered care
Community Medicine	Food poisoning, prevention	15%	Public health relevance

### **Subject-Wise Specific Learning Objectives**

<b>Subject</b>	<b>Domain</b>	<b>Specific Learning Objectives (Students will be able to...)</b>	<b>Bloom's Level</b>	<b>Integration Role</b>
Pathology	Disease Mechanisms	Explain pathogenesis of esophagitis and peptic ulcer disease	Understand	Core discipline
		Identify features of gastric neoplasms	Understand	Clinical relevance
Pharmacology	Therapeutics	Classify antiemetic drugs and explain mechanisms	Apply	Treatment planning
		Explain dose-response relationship	Analyze	Rational therapy
Medicine	Clinical Reasoning	Assess patient with vomiting and dehydration	Analyze	Clinical context
		Interpret lab findings (CBC, electrolytes)	Apply	Decision-making
Surgery	Clinical Skills	Identify indications for endoscopic evaluation	Apply	Practical application
Community Medicine	Prevention	Describe food safety and prevention of food poisoning	Understand	Public health
Behavioral Sciences	Communication	Counsel patient on diet and lifestyle	Apply	Patient-centered care

## WEEK 2

THEME	WEEK	RATIONALE	LEARNING OBJECTIVES
<b>Lower Gastrointestinal Disorders, Diarrhea &amp; IBD</b>	Week 2	This week integrates lower GI tract pathology, pharmacology, and clinical presentations. Topics include dyspepsia, peptic ulcer, appendix and small intestine diseases, inflammatory bowel disease, diarrhea management, and lifestyle modifications in IBS. It also highlights nutritional considerations and pharmacological interventions for GI disorders.	<ul style="list-style-type: none"> <li>• Describe clinical features and approach to dyspepsia and lower GI disorders.</li> <li>• Explain pathophysiology of peptic ulcer, appendicitis, small intestine obstruction, and IBD.</li> <li>• Classify and describe mechanisms of drugs used in peptic ulcer, antidiarrheals, and IBD therapy.</li> <li>• Demonstrate understanding of lifestyle and nutritional interventions in IBS.</li> <li>• Recognize pathology of appendix, stomach polyps, neoplasms, and inflammatory lesions.</li> <li>• Integrate clinical, pharmacological, and nutritional knowledge for patient management.</li> <li>• Identify indications for acute interventions in intestinal obstruction and acute abdomen cases.</li> </ul>
<b>Subtheme 1: Lower Gastrointestinal Pathologies &amp; Acute Abdomen</b>			<ul style="list-style-type: none"> <li><input type="checkbox"/> Describe anatomy and clinical features of lower GI tract disorders.</li> <li><input type="checkbox"/> Explain pathophysiology of appendicitis, intestinal obstruction, and inflammatory lesions of small and large intestine.</li> <li><input type="checkbox"/> Recognize clinical presentation and red flag signs of acute abdomen.</li> <li><input type="checkbox"/> Identify pathological features of appendix, intestinal polyps, and GI neoplasms.</li> <li><input type="checkbox"/> Differentiate between functional (IBS) and organic bowel diseases.</li> <li><input type="checkbox"/> Outline diagnostic approach (imaging, stool tests, colonoscopy, biopsy).</li> <li><input type="checkbox"/> Identify indications for urgent surgical or medical intervention in acute GI conditions.</li> </ul>
<b>Subtheme 2: Diarrhea, IBD &amp; Pharmacological/Nutritional Management</b>			<ul style="list-style-type: none"> <li><input type="checkbox"/> Classify types and causes of diarrhea (acute, chronic, infectious, inflammatory).</li> <li><input type="checkbox"/> Explain pathophysiology and clinical features of inflammatory bowel disease (UC &amp; Crohn's).</li> <li><input type="checkbox"/> Classify drugs used in peptic ulcer, antidiarrheals, and IBD (e.g., PPIs, loperamide, aminosalicylates, steroids).</li> </ul>

			<ul style="list-style-type: none"><li><input type="checkbox"/> Describe mechanisms of action, indications, and adverse effects of these drugs.</li><li><input type="checkbox"/> Apply rational drug selection in diarrhea and IBD management.</li><li><input type="checkbox"/> Demonstrate role of diet, hydration, and lifestyle modifications in IBS and chronic GI disorders.</li><li><input type="checkbox"/> Integrate pharmacological, clinical, and nutritional strategies for comprehensive patient care.</li></ul>
--	--	--	---

## Specific Learning Objectives – WEEK 2

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
M-III-GIT-PATH-004	Neoplasms and polyps of stomach	<ul style="list-style-type: none"> <li>• Classify different types of gastric Polyps.</li> <li>• Explain epidemiology, etiology, Pathogenesis of CA Stomach.</li> <li>• Diagnosis of Gastric adenocarcinoma Morphology.</li> <li>• Identify microscopic images of inflammatory bowel disease.</li> </ul>	C2 C2 C3 C3	Need to know must know Need to know Need to know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-005	Inflammatory bowel disease	<ul style="list-style-type: none"> <li>• Describe causes, pathogenesis and morphological features of Inflammatory Bowel Disease.</li> <li>• Differentiate between Ulcerative colitis and crohn's disease Microscopic Colitis and Graft-Versus-Host Disease.</li> </ul>	C2 C3	Need to know must know Need to know Need to know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-003	Gastritis and Peptic Ulcer	<ul style="list-style-type: none"> <li>• Correlate pathogenesis of Peptic ulcer disease with its morphology and clinical presentation.</li> <li>• Correlate the etiology &amp; pathogenesis of Helicobacter pylori-associated chronic gastritis with clinical presentation.</li> </ul> <p>Enlist the complications and other diseases caused by H Pylori infection.</p>	C3 C3 C1	must know must know Need to know Need to know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-032	Appendix diseases	<ul style="list-style-type: none"> <li>• Describe etio-Pathogenesis and morphology of appendicitis</li> <li>• Correlate clinical features of appendicitis with its pathogenesis</li> <li>• Counsel a patient with abdominal pain regarding need for surgery</li> <li>• Apply morphological diagnosis of acute Appendicitis</li> <li>• Classify tumors of the Appendix on the basis of morphology.</li> </ul>	C2 C2 C2 C2 C2	must know Need to know Need to know Nice to know	CBL	\PBQS

PHARMACOLOGY						
<b>MIH-GIT - PH-002</b> ua ge	Drugs used in peptic ulcers	<ul style="list-style-type: none"> <li>Classify drugs used in the treatment of Peptic Ulcer.</li> <li>Describe the mechanism of action of antacids used in the treatment of Peptic Ulcer.</li> <li>Describe the adverse effects of antacids.</li> <li>Describe the mechanism of action of H2 receptor blockers.</li> <li>Describe the adverse effects of H2 Receptor Blockers.</li> <li>Tabulate differences between cimetidine &amp; other H2 receptor blockers.</li> </ul>	C1	MUST KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
<b>MIH-GIT - PH-005</b>	Antidiarrheal drugs	<ul style="list-style-type: none"> <li>Classification of anti-diarrheal agents</li> <li>Describe important pharmacological features</li> <li>Discuss adverse effects and clinical uses</li> </ul>	C2 C2 C2	MUST KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
<b>MIH-GIT - PH-018</b>	Clinical presentation of Extrapyramidal effects of metoclopramide	<ul style="list-style-type: none"> <li>Identify the clinical manifestations of extra pyramidal symptoms (EPS) associated with metoclopramide</li> <li>Recognize the pathophysiological mechanisms underlying EPS induced by metoclopramide, including its dopamine-receptor antagonistic effects and interactions with central nervous system neurotransmitter systems</li> <li>Describe pharmacological interventions for managing EPS induced by metoclopramide, including the use of anticholinergic agents (e.g., diphenhydramine, benztropine) to reverse acute dystonic reactions and akathisia.</li> <li>Discuss the rationale for selecting specific pharmacological agents based on the type and severity of EPS, patient comorbidities, and potential drug interactions.</li> </ul>	C1  C2	MUST KNOW	CBL	MCQs SAQs SEQs EMQ VIVA
<b>MIH-GIT-</b>	Pharmacological and	<ul style="list-style-type: none"> <li>Define IBS</li> <li>Discuss pathophysiology of IBS</li> </ul>	C1 C2	MUST KNOW	SGD	MCQs SAQs SEQs

<b>PH-009</b>	lifestyle modification in IBS	<ul style="list-style-type: none"> <li>Classify drugs used in IBS</li> <li>Discuss the role of life style modification in IBS</li> </ul>	C3 C2			EMQ VIVA
<b>FORENSIC MEDICINE</b>						
<b>MIII-GIT - FM-002</b>	<b>General Toxicology-III</b>	<ul style="list-style-type: none"> <li>Enlist the steps of management of a case of poisoning</li> <li>Describe the role of elimination of unabsorbed poison</li> <li>Briefly describe the procedure of gastric lavage along with its indications, contraindications and complications</li> <li>State the role of elimination of absorbed poison with special emphasis on forced diuresis and exchange transfusion</li> <li>Briefly describe the duties of medical practitioner in a case of suspected poisoning</li> </ul>	C1 C2 C2 C2 C2	MUST KNOW MUST KNOW MUST KNOW SHOULD KNOW MUST KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
<b>SURGERY</b>						
	Approach to a patient with Acute abdomen	<ul style="list-style-type: none"> <li>Describe clinical presentation (S/S) of acute surgical abdomen. (peritonitis, intestinal obstruction, appendicitis etc.)</li> <li>Enlist differential diagnosis of acute abdominal presentations based on clinical presentations.</li> <li>Apply this theoretical knowledge to make management plan including diagnosis and treatment plan for traumatic (blunt and penetrating) and non-traumatic presentations of acute abdomen.</li> </ul>	C2 C1 C3		<b>LGIS</b>	SEQS, MCQs, OSPE
<b>MEDICINE</b>						
	Approach to a patient with Dyspepsia	<ul style="list-style-type: none"> <li>Define dyspepsia. Describe pathophysiology of gastric acid secretion.</li> <li>Describe and discuss different clinical</li> </ul>	C2 A 3		<b>LGIS/PPT</b>	SEQS, MCQs, OSPE

		presentations and treatment options for Dyspepsia				
<b>COMMUNITY MEDICINE</b>						
<b>MIH- GIT- CM- 003</b>	Dietary Components, Gastrointestin al Health, and Nutrition– Drug Interactions	<ul style="list-style-type: none"> <li>Describe the major dietary components and their roles in maintaining gastrointestinal health.</li> <li>Explain the relationship between diet and the prevention of common gastrointestinal disorders.</li> <li>Identify how certain drugs affect nutrient absorption and metabolism.</li> <li>Analyze potential nutrition–drug interactions and their clinical implications.</li> <li>Apply strategies to optimize diet and medication for maintaining gastrointestinal health.</li> </ul>	C1 C2 C3 C3 C3	MUST KNOW	LGIS	MCQs
<b>BEHAVIOURAL SCIENCE</b>						

## Transdisciplinary Clinical–Reasoning Forum (TCRF-2)

### Theme 2

#### Theme: Lower Gastrointestinal Disorders, Diarrhea & IBD

Theme	Week	Topic	Clinical Case Scenario
Theme 1	Week 2	Lower GI Disorders, Diarrhea & IBD	A 28-year male presents to the emergency department with frequent watery diarrhea for 5 days, associated with crampy lower abdominal pain, urgency, and occasional blood in stool.

#### “When the Gut Rebels: A Case of Acute Diarrhea, Abdominal Pain, and Inflammatory Bowel Disease”

##### Clinical Scenario

A 28-year male presents to the emergency department with frequent watery diarrhea for 5 days, associated with crampy lower abdominal pain, urgency, and occasional blood in stool. He reports a history of intermittent bloating and dyspepsia over the past year. No recent travel, fever, or vomiting reported. Patient mentions high-stress lifestyle and irregular meals.

##### Clinical Examination:

- Vitals: BP 105/65 mmHg, Pulse 98/min, Respiratory Rate 18/min, Mild dehydration
- Abdominal exam: Lower abdominal tenderness, no guarding or rigidity
- Other systems: Unremarkable

##### Laboratory & Initial Investigations:

- CBC: Mild leukocytosis
- Serum electrolytes: Mild hypokalemia
- Stool analysis: Positive for occult blood, no parasites
- CRP: Mildly elevated
- Imaging: Abdominal X-ray unremarkable

##### Student Task (Problem-Based Trigger)

Students are asked to:

- Describe clinical features and approach to dyspepsia and lower GI disorders.
- Explain pathophysiology of peptic ulcer, appendicitis, small intestine obstruction, and IBD.
- Classify and describe mechanisms of drugs used in peptic ulcer, antidiarrheals, and IBD therapy.
- Demonstrate understanding of lifestyle and nutritional interventions in IBS.
- Recognize pathology of appendix, stomach polyps, neoplasms, and inflammatory lesions.
- Integrate clinical, pharmacological, and nutritional knowledge for patient management.
- Identify indications for acute interventions in intestinal obstruction and acute abdomen cases.

### Students Integrate (Implicitly)

Students implicitly integrate knowledge from:

- **Pharmacology:** Antidiarrheals, PPIs, IBD drugs (aminosalicylates, steroids)
- **Pathology:** IBD, appendicitis, intestinal inflammation, neoplasms
- **Medicine:** Acute diarrhea, dehydration, abdominal pain, IBD assessment
- **Surgery:** Acute abdomen, appendectomy, intestinal obstruction management
- **Behavioral Sciences:** Stress, diet, lifestyle modification, adherence
- **Community Medicine:** Prevention of infectious diarrhea, nutrition, public health

### What Makes This Harden's Integration Level 11?

This scenario is Harden Level 11 because safe patient management requires real-time integration of clinical, pharmacological, pathological, ethical, and public-health reasoning, with no discipline functioning independently. Students must synthesize acute care decisions with long-term disease management, reflecting real clinical practice..

### Teaching Format

- Small group **problem-based learning (PBL)**
- Case-based discussion with facilitator guidance
- Simulation of **diarrhea management and drug selection**
- Interpretation of stool reports and inflammatory markers
- Role-play on **dietary counseling and stress management**

### Competency Assessment:

- Clinical reasoning

- Rational pharmacotherapy
- Diagnostic interpretation
- Preventive and counseling skills

**Academic Justification Statement**

This theme integrates lower gastrointestinal disorders, inflammatory bowel disease, and diarrhea management within a clinically relevant framework. By embedding pathology, pharmacology, and nutrition into a patient-centered scenario, learners develop the ability to make informed decisions regarding acute care, chronic disease management, and preventive strategies, ensuring comprehensive patient care.

**Subject Contribution in TCRF Session 2**

Subject / Discipline	Nature of Contribution	Approx. Integration Weight (%)	Rationale
Pathology	IBD, appendicitis, intestinal inflammation, neoplasms	25%	Core disease mechanisms
Pharmacology	Antidiarrheals, PPIs, IBD therapy	20%	Rational drug therapy
Medicine	Clinical assessment of diarrhea and IBD	20%	Clinical context
Surgery	Acute abdomen, obstruction, appendicitis	10%	Emergency relevance
Community Medicine	Nutrition, prevention of diarrhea	15%	Public health
Behavioral Sciences	Stress, lifestyle, counseling	10%	Patient-centered care

**Subject-Wise Specific Learning Objectives**

Subject	Domain	Specific Learning Objectives (Students will be able to...)	Bloom's Level	Integration Role
Pathology	Disease Mechanisms	Explain pathophysiology of IBD and intestinal inflammation	Understand	Core discipline
		Identify features of intestinal polyps and neoplasms	Understand	Clinical relevance
Pharmacology	Therapeutics	Classify antidiarrheal and IBD drugs with mechanisms	Apply	Treatment planning
		Apply rational drug selection in diarrhea management	Analyze	Clinical decision-making
Medicine	Clinical Reasoning	Assess patient with acute diarrhea and dehydration	Analyze	Clinical context
		Interpret stool findings and inflammatory markers	Apply	Decision-making
Surgery	Clinical Skills	Identify indications for surgical intervention in acute abdomen	Apply	Practical application
Community Medicine	Prevention	Describe prevention of infectious diarrhea and nutrition	Understand	Public health
Behavioral Sciences	Communication	Counsel on stress, diet, and lifestyle modification	Apply	Patient-centered care

## WEEK 3

THEME	WEEK	RATIONALE	LEARNING OBJECTIVES
<b>Lower GI Dynamics: Motility, Malabsorption &amp; Parasitic Insights</b>	Week 3	Focuses on lower GI pathologies, gut motility disorders, and parasitic infections. Integration of pharmacology (prokinetics, laxatives, anthelmintics), pathology (stool examination, colonic polyps, colorectal carcinoma), clinical skills (approach to GI malignancy), and behavioral sciences (dietary management, prebiotics/postbiotics).	<ul style="list-style-type: none"> <li>• Describe clinical features and pathophysiology of colonic polyps and colorectal carcinoma.</li> <li>• Explain diagnostic methods including stool examination and parasitology tests.</li> <li>• Classify and describe <b>prokinetic drugs, laxatives, and anthelmintic drugs</b>.</li> <li>• Demonstrate rational prescription writing for GI disorders.</li> <li>• Understand the role of prebiotics and postbiotics in gut motility.</li> <li>• Integrate clinical, pharmacological, and nutritional knowledge for managing lower GI disorders.</li> <li>• Summarize basic autopsy principles and medicolegal relevance.</li> </ul>
<b>Subtheme 1: Colorectal Pathologies, Malignancy &amp; Diagnostic Approaches</b>			<ul style="list-style-type: none"> <li>• Describe clinical features and pathophysiology of colonic polyps and colorectal carcinoma.</li> <li>• Identify risk factors and progression (adenoma–carcinoma sequence).</li> <li>• Recognize early warning signs and screening strategies for colorectal cancer.</li> <li>• Explain diagnostic techniques including stool examination, occult blood test, colonoscopy, and biopsy.</li> <li>• Interpret basic parasitological investigations (ova, cysts, parasites in stool).</li> <li>• Develop clinical approach to patients with altered bowel habits and suspected malignancy.</li> <li>• Summarize basic autopsy principles and medicolegal importance in GI-related deaths.</li> </ul>
<b>Subtheme 2: Gut Motility, Parasitic Infections &amp; Therapeutic Interventions</b>			<ul style="list-style-type: none"> <li><input type="checkbox"/> Explain physiology and disorders of gut motility (constipation, ileus, motility disorders).</li> <li><input type="checkbox"/> Classify prokinetic drugs and laxatives with mechanisms of action and uses.</li> </ul>

			<ul style="list-style-type: none"><li><input type="checkbox"/> Classify anthelmintic drugs and correlate with common parasitic infections.</li><li><input type="checkbox"/> Demonstrate rational prescription writing for constipation, parasitic infections, and motility disorders.</li><li><input type="checkbox"/> Describe role of diet, fiber, prebiotics, and postbiotics in maintaining gut health.</li><li><input type="checkbox"/> Integrate pharmacological, nutritional, and clinical approaches for patient management.</li><li><input type="checkbox"/> Apply holistic management including lifestyle modification in chronic GI conditions.</li></ul>
--	--	--	--

### Specific Learning Objectives – WEEK 3

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
M-III-GIT-PATH-006	Colorectal carcinoma	<ul style="list-style-type: none"> <li>Discuss differential diagnosis based on clinical and morphological features.</li> <li>Classify colonic neoplasms</li> <li>Explain genetic etiology and molecular pathogenesis of colorectal adenocarcinoma.</li> <li>Describe hereditary Non-Polyposis Colorectal carcinoma.</li> <li>Enumerate staging of colorectal Adenocarcinoma.</li> <li>Identify tumor of colon on gross and microscopy</li> </ul>	C3 C2 C2 C2 C1 C3	must know must know Need to know Need to know Need to know Need to know	<b>LGIS</b>	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-021	Colonic polyps and appendix	<ul style="list-style-type: none"> <li>Classify intestinal inflammatory and neoplastic Polyps.</li> <li>Describe syndromic association of polyps.</li> <li>Discuss epidemiology, etiology, Pathogenesis and morphological features of polyps</li> <li>Describe the pathogenesis morphology of different lesions of appendix</li> </ul>	C3 C2 C2 C2	Must know Need to know Must know Need to know	<b>SGD</b>	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-033	Stool examination/ Parasitology (practical)	<ul style="list-style-type: none"> <li>Describe importance of stool examination.</li> <li>Differentiate common parasite ova on basis of morphology.</li> <li>Describe sample collection and transportation.</li> </ul> Identification of common pathogens and parasites & eggs/ ova	C2 C2 C2 P 2	must know must know Need to know must know Need to know	<b>PRACTICAL</b>	<b>OSPE</b>
M-III-GIT-	Food intolerance	<ul style="list-style-type: none"> <li>Describe the clinical features of food intolerance</li> <li>Correlate the clinical features with pathogenesis</li> </ul>	C2 C1	Need to know	<b>CBL</b>	\PBQS

PATH-033		and morphological features of food intolerance <ul style="list-style-type: none"> <li>• Counsel a patient with food intolerance regarding dietary habits and life style modification</li> </ul>	P3	Nice to know Need to know Need to know		
<b>PHARMACOLOGY</b>						
<b>MIII-GIT-PH-006</b>	Laxatives	<ul style="list-style-type: none"> <li>• Classify Purgatives/Laxatives.</li> <li>• Discuss the important pharmacological features of purgatives &amp; Laxatives.</li> <li>• Enumerate uses &amp; adverse effects of each group.</li> </ul> Use of lactulose in Hepatic Encephalopathy.	C1 C2 C3 C 2	Should know	LGIS	MCQs SAQs SEQs EMQ VIVA
<b>MIII-GIT-PH-011</b>	Prokinetic drugs	<ul style="list-style-type: none"> <li>• Define Prokinetic drugs.</li> <li>• Classify the group of drugs that are used as Prokinetics.</li> </ul> Explain mechanism of action, uses and adverse effects of D2 blockers drugs	C1 C2 C3 C 2	MUST KNOW	SGD	MCQs SAQs SEQs EMQ VIVA
<b>MIII-GIT-PH-010</b>	Role of prebiotics and postbiotics in gut motility	<ul style="list-style-type: none"> <li>• Define the prebiotics, postbiotic and distinguish them from prebiotics in pharmacological content</li> </ul> Explain the mechanism of action and identify the specific probiotic strains and postbiotic components that have pharmacologically relevant effects on GIT motility.	C3 C1 C3 C 1	MUST KNOW	SGD	MCQs SAQs SEQs EMQ VIVA
<b>MIII-GIT-PH-015</b>	P drugs and prescription writing amoebic dysentery and	<ul style="list-style-type: none"> <li>• Recall the drugs used in amoebic dysentery</li> <li>• Describe suitable drugs for the patient with amoebic dysentery Recall the drugs used in worm infestations.</li> <li>• Write a suitable prescription for patient with Ascariasis &amp; Enterobius Vermicularis.</li> </ul>	P1 P2	Should know	PRACTICAL	OSPE

	worm infestation					
<b>FORENSIC MEDICINE</b>						
<b>MIH-GIT-FM-003</b>	<b>Medicolegal Autopsy-I</b>	<ul style="list-style-type: none"> <li>Define medicolegal autopsy</li> <li>Classify autopsy and narrate the objectives of medicolegal autopsy.</li> <li>Briefly state the autopsy protocol and its requirements.</li> </ul> <p>Describe the contents of a medicolegal autopsy report and its procedure.</p>	C1 C2 C2 C 2	MUST KNOW MUST KNOW SHOULD KNOW SHOULD KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
<b>MIH-GIT-FM-007</b>	<b>Autopsy Visit to mortuary</b>	<ul style="list-style-type: none"> <li>Enumerate the contents of Medico-legal &amp; postmortem reports.</li> <li>Briefly describe different sections of mortuary.</li> <li>State the requirements of a mortuary.</li> </ul> <ul style="list-style-type: none"> <li>Classify the hazards of autopsy.</li> </ul>	C1 C2 C2 C2	MUST KNOW MUST KNOW SHOULD KNOW	SGD (Practical)	MCQs SAQs SEQs EMQ VIVA OSPE
<b>SURGERY</b>						
	Approach to a patient with Abdominal hernias	<ul style="list-style-type: none"> <li>Recognize different types of abdominal hernias</li> <li>Describes management plan for each type of hernia.</li> <li>Explain possible complications associated with hernias</li> </ul>	C2 C2 C2		LGIS	SEQS, MCQs OSPE
<b>FAMILY MEDICINE</b>						
	GIT Pathologies	<ul style="list-style-type: none"> <li>Classify enteric infections</li> <li>Describe the aetiology, clinical features, investigations and management of Salmonellosis</li> <li>Describe the red-flags in a patient with Salmonella infections for referral to specialty care</li> <li>Explain the etiology, and management of acute gastroenteritis</li> </ul>	C1 C2 C2 C3 C2 C3		LGIS	MCQs

		<ul style="list-style-type: none"><li>• Discuss the primary and secondary prevention of acute gastroenteritis in a primary healthcare setting</li></ul> Describe the red-flags in a patient with acute gastroenteritis for referral to specialty care				
<b>BEHAVIOURAL SCIENCE</b>						

## WEEK 4

THEME	WEEK	RATIONALE	LEARNING OBJECTIVES
<b>Parasitic &amp; Infectious Disorders of the Gastrointestinal Tract</b>	Week 4	Focuses on feco-oral and parasitic gastrointestinal infections, malabsorptive diarrhea, and pancreatic disorders. Integration of community medicine (epidemiology & prevention), pathology (intestinal and blood protozoa), pharmacology (antiamoebic drugs), and research (questionnaire design) provides a comprehensive view of infectious GI disorders and preventive strategies.	<ul style="list-style-type: none"> <li>• Describe epidemiology and prevention of feco-oral infections.</li> <li>• Identify diarrhea-causing protozoa and their pathology</li> <li>• Explain blood and tissue protozoa (<i>Leishmania</i>, <i>Trypanosoma</i>) features.</li> <li>• Classify and describe antiamoebic drugs and their mechanism.</li> <li>• Understand malabsorptive diarrhea pathophysiology.</li> <li>• Recognize pancreatic diseases relevant to GI disorder</li> <li>• Develop research skills in questionnaire design for epidemiological studies.</li> </ul>
<b>Subtheme 1: Infectious &amp; Parasitic GI Disorders with Epidemiology</b>			<ul style="list-style-type: none"> <li>• Describe epidemiology, transmission, and prevention of feco-oral infections.</li> <li>• Identify common diarrhea-causing intestinal protozoa (e.g., <i>Entamoeba</i>, <i>Giardia</i>) and their pathology.</li> <li>• Explain clinical features and life cycles of intestinal parasites.</li> <li>• Describe blood and tissue protozoa (<i>Leishmania</i>, <i>Trypanosoma</i>) and their systemic manifestations.</li> <li>• Understand pathophysiology of malabsorptive diarrhea in infectious conditions.</li> <li>• Correlate environmental, hygienic, and community factors with disease spread.</li> <li>• Apply preventive strategies including sanitation, safe water, and public health measures.</li> </ul>
<b>Subtheme 2: Therapeutics, Pancreatic Involvement &amp; Research Integration</b>			<ul style="list-style-type: none"> <li>• Classify antiamoebic and antiparasitic drugs with mechanisms of action and indications.</li> <li>• Apply rational drug therapy in parasitic and infectious GI disorders.</li> <li>• Recognize pancreatic disorders (e.g., pancreatitis, exocrine insufficiency) related to GI symptoms.</li> <li>• Explain role of pancreas in digestion and its link with malabsorption.</li> <li>• Integrate pharmacological and clinical knowledge in managing infectious diarrhea.</li> <li>• Develop basic research skills including questionnaire design for epidemiological studies.</li> <li>• Interpret simple community-based data for disease patterns and prevention planning.</li> </ul>

### Specific Learning Objectives – WEEK 4

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGY	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
M-III-GIT-PATH-031	Diarrhea causing protozoa	<ul style="list-style-type: none"> <li>Describe transmission &amp; Life cycle</li> <li>Enlist Clinical features of intestinal Amoebiasis</li> <li>Explain Extra intestinal amoebiasis</li> <li>Interpret Lab diagnosis</li> <li>Differentiate between amebic and bacillary dysentery</li> <li>Plan treatment &amp; prevention</li> <li>Describe life cycle and diseases caused by Giardia and enlist other nonpathogenic amoebas.</li> <li>Describe clinical features of diarrhea caused by different protozoa</li> <li>Identify etiological cause of diarrhea on the basis of clinical features and morphology of fecal specimen.</li> <li>Describe responsibilities of physicians &amp; public health authorities in communicable diseases</li> </ul>	C2 C1 C2 C3  C2 C3 C2  C2 P3	Must know Must know Must know Need to know  Need to know Need to know Must know Must know need to know	CBL	PBQS
M-III-GIT-PATH-013	Diseases of Pancreas	<ul style="list-style-type: none"> <li>Describe morphological features of Congenital Anomalies.</li> <li>Discuss etiology, pathogenesis and morphological features of acute Pancreatitis and chronic Pancreatitis</li> <li>Classify pancreatic Cysts.</li> <li>Classify pancreatic benign and malignant tumors.</li> <li>Describe the lab diagnosis of pancreatitis.</li> </ul>	C2 C2  C1 C1 C2	Need to know must know Need to know Need to know must know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-	Malabsorptive	<ul style="list-style-type: none"> <li>Discuss causes, pathogenesis and diagnosis of Malabsorption and Diarrhea.</li> </ul>	C2	Must know Need to know	SGD	MCQs SAQs SEQs EMQ

PATH-020	diarrhea	<ul style="list-style-type: none"> <li>Explain Pathogenesis and diagnosis of Cystic Fibrosis.</li> <li>Describe the pathogenesis and morphology of Celiac disease.</li> </ul>	C2 C2	Need to know		VIVA
M-III-GIT-PATH-018	Introduction to parasitology	<ul style="list-style-type: none"> <li>Define and Differentiate between, Definitive host,</li> <li>Intermediate host, Vector, Carrier state, Reservoir, Symbiosis, Mutualism, Forms in which parasites exist.</li> <li>Classify medically important parasites.</li> </ul>	C2  C2	Must know Must know Must know Nice to know	SGD	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-014	Intestinal and urogenital protozoa	<ul style="list-style-type: none"> <li>Enlist the protozoa causing disease in intestine and urogenital tract</li> <li>Describe transmission &amp; Life cycle</li> <li>Enlist Clinical features of intestinal Amoebiasis</li> <li>Explain Extra intestinal amoebiasis</li> <li>Interpret Lab diagnosis</li> <li>Differentiate between amebic and bacillary dysentery</li> <li>Plan treatment &amp; prevention</li> <li>Describe life cycle and diseases caused by Giardia and enlist other non-pathogenic amoebas.</li> <li>Describe clinical features of diarrhea caused by different protozoa</li> <li>Identify etiological cause of diarrhea on the basis of clinical features and morphology of fecal specimen.</li> </ul>	C2 C2 C2 C1 C1 C2 C2 C2 C2 C2	Need to know Must know Must know Must know Must know Need to know Need to know Need to know Need to know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-016	Blood and tissue protozoa leishmania and Trypanosoma	<ul style="list-style-type: none"> <li>Enlist the protozoa residing in blood and tissues</li> <li>Describe transmission &amp; Life cycle</li> <li>Enlist Clinical features of leishmaniasis and trypanosomiasis</li> <li>Interpret Lab diagnosis</li> <li>Plan treatment &amp; prevention</li> <li>Identify different forms of parasite species</li> </ul>	C2 C2 C2 C1 C2	Need to know must know Need to know Need to know Need to know Need to know	LGIS	MCQs SAQs SEQs EMQ VIVA

PHARMACOLOGY						
MIII-GIT - PH-003	Antiamoebic drugs	<ul style="list-style-type: none"> <li>Define antiamoebic drugs and classify them based on their mechanism of action.</li> <li>Describe the pharmacokinetics and pharmacodynamics of commonly used antiamoebic drugs.</li> <li>Identify indications, dosing, and adverse effects of major antiamoebic agents.</li> <li>Explain the rationale for drug selection in different types of amoebic infections.</li> <li>Apply principles of treatment and prevention of amoebiasis in clinical practice.</li> </ul>	C1	MUST KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
FORENSIC MEDICINE						
MIII-GIT - FM-004	Medicolegal Autopsy-II	<ul style="list-style-type: none"> <li>Describe the preservation of viscera and other articles during an autopsy.</li> <li>Define negative and obscure autopsy and write its causes.</li> <li>Describe the procedure of exhumation and its Forensic Importance.</li> <li>Briefly explain examination of mutilated and decomposed bodies</li> <li>Define Postmortem artifacts and its type w.r.t their medico-legal importance</li> </ul>	C1 C1 C2 C2 C2	SHOULD KNOW MUST KNOW SHOULD KNOW MUST KNOW SHOULD KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
COMMUNITY MEDICINE						
MIII-GIT-CM-005	Epidemiology and Prevention of Feco-Oral Gastrointestinal Infections	<ul style="list-style-type: none"> <li>Define feco-oral gastrointestinal infections and describe their common causative agents.</li> <li>Explain the epidemiology and modes of transmission of feco-oral infections.</li> <li>Identify risk factors and populations vulnerable to feco-oral infections.</li> <li>Describe public health strategies and preventive measures to control feco-oral infections.</li> </ul>	C1 C2 C3 C3 C3	MUST KNOW	LGIS	MCQs

		<ul style="list-style-type: none"> <li>Apply principles of outbreak investigation and community-based interventions to reduce infection incidence.</li> </ul>				
<b>INTEGRATED UNDERGRADUATE RESEARCH CURRICULUM (IUGRC)</b>						
MIII-GIT - SI(IUGRC)-02	Questionnaire Development	<ul style="list-style-type: none"> <li>Understand questionnaires used in research</li> <li>Categorize types of questions used in research their advantages and disadvantages</li> <li>Identify Designs and stages of development of questionnaire</li> <li>Interpret Simple rules for writing a good questionnaire</li> <li>Appraise Parts and Layout of questionnaire</li> </ul>	C2 C3 C1 C2 C2	MUST KNOW	LGIS	MCQs

## Transdisciplinary Clinical–Reasoning Forum (TCRF-3)

### Theme 3 & 4

#### Theme: Lower GI Dynamics: Motility, Malabsorption & Parasitic Insights / Parasitic & Infectious Disorders of the Gastrointestinal Tract

Theme	Week	Topic	Clinical Case Scenario
Theme 3& 4	4	Lower GI Dynamics / Parasitic & Infectious Disorders	A 24-year male presents to the clinic with persistent diarrhea for 4 weeks, associated with abdominal cramps, bloating, and unintentional weight loss.

#### “When the Gut Falters: A Case of Chronic Diarrhea, Malabsorption, and Parasitic Infection”

##### Clinical Scenario

A 24-year male presents to the clinic with persistent diarrhea for 4 weeks, associated with abdominal cramps, bloating, and unintentional weight loss. He reports intermittent constipation alternating with loose stools, and occasional mucus in stool. History reveals consumption of street food and untreated water, and frequent use of laxatives for constipation. He also complains of fatigue and occasional joint pains.

##### Clinical Examination:

- Vitals: BP 100/65 mmHg, Pulse 94/min, Mild dehydration
- Abdominal exam: Mild distension, diffuse tenderness, no guarding
- Other systems: Pallor present, no hepatosplenomegaly
- Nutritional status: Low BMI, signs of nutrient deficiencies

##### Laboratory & Initial Investigations:

- CBC: Mild anemia, leukocytosis
- Serum electrolytes: Mild hypokalemia
- Stool analysis: Presence of cysts of *Giardia lamblia*, occult blood negative
- Colonoscopy: Colonic polyps noted, biopsy taken
- Imaging: Ultrasound unremarkable

##### Student Task (Problem-Based Trigger)

Students are asked to:

- Describe clinical features and pathophysiology of colonic polyps and colorectal carcinoma.
- Identify adenoma–carcinoma sequence and risk factors for malignancy.

- Explain diagnostic methods including stool examination, occult blood testing, colonoscopy, and biopsy.
- Interpret parasitological investigations (ova, cysts, parasites).
- Explain gut motility disorders including constipation and ileus.
- Classify and describe prokinetic drugs, laxatives, anthelmintic, and antiamoebic drugs with mechanisms.
- Demonstrate rational prescription writing for constipation, parasitic infections, and infectious diarrhea.
- Understand pathophysiology of malabsorptive diarrhea.
- Recognize pancreatic disorders related to GI symptoms and malabsorption.
- Describe epidemiology, transmission, and prevention of feco-oral infections.
- Explain role of diet, fiber, prebiotics, and postbiotics in gut health.
- Develop basic research skills including questionnaire design.
- Integrate clinical, pharmacological, nutritional, and public health knowledge for patient management.
- Summarize autopsy principles and medicolegal relevance in GI diseases.

### **Students Integrate (Implicitly)**

Students implicitly integrate knowledge from:

- Pharmacology: Prokinetics, laxatives, anthelmintics, antiamoebics
- Pathology: Colorectal carcinoma, polyps, protozoal infections, malabsorption
- Medicine: Chronic diarrhea, GI malignancy, infectious diseases
- Surgery: Colorectal cancer management, obstruction, biopsy relevance
- Community Medicine: Epidemiology, sanitation, prevention strategies
- Behavioral Sciences: Diet, hygiene, lifestyle modification
- Research: Questionnaire design and data interpretation

### **What Makes This Harden's Integration Level 11?**

This integrated scenario reflects Harden Level 11 as students must simultaneously interpret clinical findings, stool reports, and colonoscopy results while formulating pharmacological treatment and preventive strategies. Decision-making spans acute management, chronic disease evaluation, infection control, and public health planning, with no single discipline functioning independently—mirroring real-world clinical complexity.

### **Teaching Format**

- Small group problem-based learning (PBL)
- Case-based integrated discussion
- Stool and parasitology report interpretation
- Prescription writing and drug selection exercises
- Role-play on dietary counseling, hygiene, and lifestyle modification
- Research workshop on questionnaire design

### **Competency Assessment:**

- Clinical reasoning

- Diagnostic interpretation
- Rational pharmacotherapy
- Preventive and counseling skills
- Research and analytical skills

**Academic Justification Statement**

This combined theme integrates lower gastrointestinal motility disorders, colorectal malignancies, and parasitic/infectious diseases within a single clinical framework. By linking pathology, pharmacology, clinical medicine, nutrition, and public health, students develop the ability to manage both acute and chronic GI conditions while incorporating prevention and research-based decision-making, ensuring holistic patient care.

**Subject Contribution in TCRF Session 3**

Subject / Discipline	Nature of Contribution	Approx. Integration Weight (%)	Rationale
Pathology	Polyps, colorectal carcinoma, protozoa, malabsorption	25%	Core disease mechanisms
Pharmacology	Prokinetics, laxatives, anthelmintics, antiamebics	20%	Drug therapy
Medicine	Chronic diarrhea, GI malignancy, infections	20%	Clinical context
Community Medicine	Epidemiology, prevention, sanitation	15%	Public health
Surgery	Malignancy management, biopsy, obstruction	10%	Clinical relevance
Research	Questionnaire design, data interpretation	5%	
Behavioral Sciences	Diet, hygiene, lifestyle	5%	Patient-centered care

**Subject-Wise Specific Learning Objectives**

Subject	Domain	Specific Learning Objectives	Bloom's Level	Integration Role
Pathology	Disease Mechanisms	Explain pathophysiology of colorectal carcinoma and polyps	Understand	Core discipline
		Identify protozoal infections and malabsorptive diarrhea	Understand	Clinical relevance
Pharmacology	Therapeutics	Classify prokinetics, laxatives, anthelmintics, antiamebics	Apply	Treatment planning
		Apply rational drug therapy in GI disorders	Analyze	Clinical decision-making
Medicine	Clinical Reasoning	Assess chronic diarrhea and suspected malignancy	Analyze	Clinical context
		Interpret stool, colonoscopy, and lab findings	Apply	Decision-making
Surgery	Clinical Skills	Identify indications for intervention in colorectal disease	Apply	Practical application
Community Medicine	Prevention	Describe epidemiology and prevention of feco-oral infections	Understand	Public health
Behavioral Sciences	Communication	Counsel on diet, hygiene, and lifestyle modification	Apply	Patient-centered care
Research	Skills	Develop questionnaire and interpret basic data	Apply	Skill integration

## WEEK 5

THEME	WEEK	RATIONALE	LEARNING OBJECTIVES
<b>Parasitic and Viral Hepatic Disorders</b>	Week 5	<p>Week 5 focuses on <b>intestinal parasites, antihelminthic pharmacology, and liver disorders</b>. Integration of pathology (tissue &amp; intestinal protozoa, cestodes, nematodes, trematodes, fatty liver, cirrhosis, hydatid cyst), pharmacology (antihelminthic drugs, hepatitis B drugs), and clinical medicine (viral hepatitis, liver cirrhosis, metabolic liver diseases) ensures understanding of infectious and hepatic GI disorders. Research and community medicine sessions enhance epidemiological and preventive knowledge.</p>	<ul style="list-style-type: none"> <li>• Describe clinical and pathological features of <b>intestinal protozoa, cestodes, nematodes, trematodes</b>.</li> <li>• Classify and explain <b>mechanisms and uses of antihelminthic drugs</b>.</li> <li>• Identify pathology and clinical presentation of <b>fatty liver, cirrhosis, hydatid cyst, and hepatitis</b>.</li> <li>• Demonstrate rational prescription of drugs for parasitic and viral hepatic disorders.</li> <li>• Explain approach to patients with <b>viral hepatitis and liver cirrhosis</b>.</li> <li>• Integrate parasitology, pharmacology, and medicine knowledge for patient management.</li> <li>• Apply research skills (SPSS, manuscript writing) and epidemiological understanding in liver and parasitic diseases.</li> </ul>
<b>Subtheme 1: Parasitic Infections &amp; Hepatic Pathology</b>			<ul style="list-style-type: none"> <li>• Describe classification and clinical features of intestinal protozoa, cestodes, nematodes, and trematodes.</li> <li>• Explain life cycles and transmission of common helminths and protozoa.</li> <li>• Identify pathological features of hydatid cyst and its hepatic involvement.</li> <li>• Describe pathology and clinical presentation of fatty liver and liver cirrhosis.</li> <li>• Explain spectrum of viral hepatitis (A, B, C, etc.) and their hepatic effects.</li> <li>• Correlate parasitic and infectious causes with liver disease manifestations.</li> <li>• Recognize complications of chronic liver disease (portal hypertension, ascites).</li> </ul>
<b>Subtheme 2: Pharmacological Management, Clinical Approach &amp; Research Integration</b>			<ul style="list-style-type: none"> <li>• Classify antihelminthic drugs with mechanisms of action, uses, and adverse effects.</li> <li>• Describe drugs used in viral hepatitis (especially Hepatitis B) and their mechanisms.</li> <li>• Demonstrate rational prescription writing for parasitic infections and hepatic disorders.</li> <li>• Outline clinical approach to patients with jaundice, viral hepatitis, and cirrhosis.</li> <li>• Integrate pharmacological and clinical knowledge for comprehensive patient management.</li> <li>• Apply principles of epidemiology in prevention of parasitic and hepatic diseases.</li> <li>• Develop basic research skills including SPSS usage and manuscript writing.</li> </ul>

## Specific Learning Objectives – WEEK 5

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
M-III-GIT-PATH-007	Types of hepatitis and metabolic liver diseases	<ul style="list-style-type: none"> <li>Discuss etiology, pathogenesis, laboratory diagnosis of autoimmune Hepatitis</li> <li>Describe Drug- and Toxin-Induced Liver Injury.</li> <li>Enumerate morphological features of alcoholic Liver Disease Non-alcoholic Fatty Liver Disease (NAFLD).</li> <li>Enlist causes and morphological features of metabolic Liver Disease (Hemochromatosis, Wilson disease, <math>\alpha</math>1-Antitrypsin Deficiency).</li> </ul>	C2 C2 C3  C1	Need to know Must know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-015	Blood and tissue protozoa Plasmodium	<ul style="list-style-type: none"> <li>Enlist the protozoa residing in blood and tissues</li> <li>Describe transmission &amp; Life cycle</li> <li>Enlist Clinical features of plasmodium infection</li> <li>Interpret Lab diagnosis</li> <li>Plan treatment &amp; prevention</li> <li>Identify different forms of parasite species</li> </ul>	C2 C2 C2 C1 C1 C2	Need to know must know Must know Must know Must know Need to know	SGD	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-023	Intestinal cestodes	<ul style="list-style-type: none"> <li>Classify the cestodes.</li> <li>Describe morphological features of cestodes.</li> <li>Enlist diseases caused by each type</li> <li>Describe life cycle of these parasites.</li> <li>Explain transmission, epidemiology and Pathogenesis of diseases caused by them.</li> <li>Explain the diagnosis on the basis of clinical features and laboratory findings.</li> </ul>	C2 C2 C2 C2  C2 C2 C2	Must know Need to know Need to know Must know Must know Need to know	LGIS	MCQs SAQs SEQs EMQ VIVA

		<ul style="list-style-type: none"> <li>Describe treatment and prevention.</li> </ul>				
M-III-GIT-PATH-022	Tissue cestodes	<ul style="list-style-type: none"> <li>Classify the cestodes.</li> <li>Describe morphological features of cestodes.</li> <li>Enlist diseases caused by each type.</li> <li>Describe life cycle of these parasites.</li> <li>Explain transmission, epidemiology and Pathogenesis of diseases caused by them.</li> <li>Establish the diagnosis on the basis of clinical features and laboratory findings.</li> <li>Describe treatment and prevention.</li> </ul>	C1 C2 C1 C2 C2 C3 C2	Must know Need to know Need to know Must know Must know Need to know	SGD	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-024	Intestinal nematodes	<ul style="list-style-type: none"> <li>Enumerate Nematodes of intestine.</li> <li>Describe the morphological features.</li> <li>Enlist diseases caused by each type.</li> <li>Describe life cycle of these parasites.</li> <li>Explain transmission, epidemiology and Pathogenesis of diseases caused by them.</li> <li>Explain the diagnosis on the basis of clinical features and laboratory findings.</li> </ul>	C1 C3 C2 C2 C3 C3	must know Need to know Need to know Need to know must know must know Need to know	SGD	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-025	Tissue nematodes	<ul style="list-style-type: none"> <li>Enumerate Nematodes of tissues.</li> <li>Describe the morphological features.</li> <li>Enlist diseases caused by each type.</li> <li>Describe life cycle of these parasites.</li> <li>Explain transmission, epidemiology and Pathogenesis of diseases caused by them.</li> <li>Explain the diagnosis on the basis of clinical features and laboratory findings.</li> </ul>	C1 C3 C2 C2 C3 C3	Must know Need to know Need to know Need to know Must know Must know Need to know	SGD	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-026	Trematodes	<ul style="list-style-type: none"> <li>Enlist Diseases caused by each type with Characteristics.</li> <li>Comprehend life cycle, transmission epidemiology &amp; pathogenesis.</li> <li>Interpret Laboratory diagnosis.</li> </ul>	C1 C2 C2 C2	must know Need to know Need to know Need to know	SGD	MCQs SAQs SEQs EMQ VIVA

		<ul style="list-style-type: none"> <li>Plan treatment and prevention.</li> </ul>		must know must know Need to know		
M-III-GIT-PATH-034	Fatty change, Cirrhosis, CA liver	<ul style="list-style-type: none"> <li>Recall important histomorphology features for diagnosis of fatty change, Cirrhosis, CA liver</li> <li>Identify the slides and recognize two points of identification of Fatty change, Cirrhosis, CA liver</li> </ul>	C2  C2 P2	must know must know must know	<b>PRACTICAL</b>	<b>OSPE</b>
M-III-GIT-PATH-034	Hydatid disease	<ul style="list-style-type: none"> <li>Enlist diseases caused by each type.</li> <li>Describe important features of life cycle of these parasites.</li> <li>Explain transmission, epidemiology and Pathogenesis of diseases caused by them.</li> <li>Explain the diagnosis on the basis of clinical features and laboratory findings. Describe treatment and prevention.</li> </ul>	C2 C1 C2 C2 C2	Must know Need to know Need to know Need to know Need to know Need to know Need to know	CBL	PBQS
<b>PHARMACOLOGY</b>						
<b>MIII-GIT-PH-003</b>	Antiamoebic Drugs II	<ul style="list-style-type: none"> <li>Classify antiamoebic drugs and explain their mechanisms of action.</li> <li>Describe the clinical indications and dosing of commonly used antiamoebic agents.</li> <li>Identify adverse effects and contraindications of major antiamoebic drugs.</li> <li>Explain the treatment strategies for different forms of amoebic infections (intestinal vs extraintestinal).</li> <li>Apply principles of drug selection and monitoring in patients receiving antiamoebic therapy.</li> </ul>	C2	MUST KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA

<b>MIII-GIT-PH-004</b>	Anthelmintic drugs	<ul style="list-style-type: none"> <li>Classify anthelmintic therapeutically.</li> <li>Explain mechanism of action of each group.</li> <li>Discuss the adverse effects of each group.</li> </ul>	C1 C2	MUST KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
<b>MIII-GIT-PH-008</b>	Drugs used in hepatitis B	<ul style="list-style-type: none"> <li>Discuss drug used for treatment of Hepatitis B viral infections</li> </ul> Discuss the mechanism of action, uses and adverse effects of drugs used in hepatitis B infection.	C2  C 2	MUST KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
<b>MIII-GIT-PH-014</b>	Demonstration of drug antagonism using rabbit ileum	<ul style="list-style-type: none"> <li>Demonstrate the effects on dose response curve of different doses of acetylcholine in the presence of atropine</li> <li>Demonstrate the surmountable antagonism between acetylcholine and atropine</li> </ul>	P1  P2	Should know	PRACTICAL	OSPE
<b>FORENSIC MEDICINE</b>						
<b>MIII-GIT-FM-008</b>	<b>Medicinal poisons</b> (Paracetamol & Aspirin) (CBL)	<ul style="list-style-type: none"> <li>Enlist the types of Analgesics used commonly as self-harm</li> <li>Briefly describe the clinical presentation of analgesic intoxication</li> <li>Explain the management of acute analgesic intoxication in general</li> <li>State the Medicolegal importance of analgesic intoxication</li> </ul>	C1  C2  C2  C2	Must know  must know  Should know  Must know	SGD  (Practical)	MCQs SAQs SEQs EMQ VIVA  OSPE
<b>MEDICINE</b>						
	Medical aspect of parasitology	<ul style="list-style-type: none"> <li>Discuss common intestinal parasitic infections e.g. amebiasis, giardiasis, ascariasis, schistosomiasis</li> <li>Describe and discuss clinical features of common parasitic infections</li> </ul> Discuss relevant questions on history to differentiate between different parasitic	C2 A 3		LGIS/PPT	SEQs, MCQs, OSPE

		infections. Overview of treatment				
	Seminar on Hepatitis	<ul style="list-style-type: none"> <li>able to define acute and chronic viral hepatitis and Different types of viruses causing Hepatitis and their natural course of disease.</li> <li>Describe Clinical features and complications of viral hepatitis.</li> </ul> Describe Investigations to diagnosis different viral hepatitis and for complications.	C2 A 3		LGIS/PPT	SEQS, MCQs, OSPE
<b>COMMUNITY MEDICINE</b>						
<b>MIII-GIT - CM-009</b>	Amoebiasis Ascariasis Hookworm infections	<ul style="list-style-type: none"> <li>Explain the definition, epidemiology, clinical features and prevention of protozoa</li> <li>Mention causal agent, geographic distribution, and life cycle, and habitat, mode of infection, pathology, clinical features, diagnosis and preventive strategies of Ascariasis.</li> <li>Understand the mode of transmission, clinical symptoms, diagnosis, treatment and prevention.</li> </ul>	C2  C2 C2	MUST KNOW	LGIS	MCQs
<b>MIII-GIT - CM-007</b>	Hepatitis	<ul style="list-style-type: none"> <li>Provide overview of hepatitis</li> <li>Outline of classification and characteristics of hepatitis viruses</li> <li>Structure, epidemiology,</li> <li>Pathogenesis, clinical outcome and laboratory diagnosis of hepatitis a virus, hepatitis b virus, hepatitis c virus, hepatitis d virus, hepatitis e virus, hepatitis g.</li> <li>Provide an overview of drug therapy</li> <li>Explain healthcare practitioner's role in prevention and awareness of hepatitis</li> </ul>	C1 C3  C3 C2 C2	MUST KNOW	LGIS	MCQs
<b>Integrated Undergraduate Research Curriculum (IUGRC)</b>						
<b>MIII-GIT - SI(U</b>	Hands on Session on SPSS	<ul style="list-style-type: none"> <li>Make variables on SPSS</li> <li>Feed data under variables on computers</li> <li>Summarize data on computer including text, tabulations</li> </ul>	C2  C2	MUST KNOW	LGIS	MCQs

GRC) - 03 & 04	Manuscript writing	& graphics <ul style="list-style-type: none"> <li>Perform Descriptive analysis of data on computer</li> <li>Organize, and save data in a suitable way.</li> <li>Calculate/recode variables and prepare data for analysis.</li> <li>Conduct descriptive and basic inferential statistics.</li> <li>be familiar with SPSS presentation of statistical output.</li> <li>Create and edit graphical displays of data.</li> <li>Interpret &amp; apply basic principles of manuscript writing of research report</li> <li>Perceive authorships requirements or rules of drafting manuscript of a research report for publication in indexed journal</li> <li>Write discussion section of draft</li> <li>Explain conclusion, recommendation and acknowledge part of research report</li> <li>Clarify types of citations included in discussion section</li> </ul>	C2 C3 C3 C3 C3 C2 C3			
<b>FAMILY MEDICINE</b>						
	Liver Diseases	<ul style="list-style-type: none"> <li>Explain the aetiology and clinical features of acute hepatitis</li> <li>Explain the management strategies of acute hepatitis in family practice</li> <li>Explain the aetiology, clinical features and complications of Chronic hepatitis</li> <li>Explain the management strategies of chronic hepatitis in family practice</li> </ul> <p>Describe the red-flags in a patient with acute and chronic hepatitis for referral to specialty care</p>	C1 C2 C2 C3 C2		LGIS	MCQs
		<ul style="list-style-type: none"> <li></li> </ul>				

## WEEK 6

THEME	WEEK	RATIONALE	LEARNING OBJECTIVES
<b>Hepatobiliary Disorders and Viral Hepatitis Management</b>	Week 6	Week 6 integrates <b>hepatobiliary diseases, viral hepatitis, and their management</b> . Focus is on liver pathology (neoplasms, cirrhosis, fatty liver, cholestasis, gallbladder diseases, ascites, obstructive jaundice), pharmacology (antiviral drugs, counselling, practical skills), clinical medicine (approach to jaundice, ascites), and preventive strategies from community medicine (epidemiology of viral hepatitis and foodborne illnesses).	<ul style="list-style-type: none"> <li>• Describe clinical and pathological features of <b>hepatobiliary disorders</b>: neoplasms, cirrhosis, fatty liver, cholestasis, gallbladder disease, ascites, obstructive jaundice.</li> <li>• Explain mechanisms, indications, and use of <b>antiviral drugs for hepatitis C and B</b>.</li> <li>• Demonstrate patient approach to <b>jaundice and ascites</b>.</li> <li>• Understand laboratory diagnosis of hepatobiliary diseases.</li> <li>• Discuss epidemiology, prevention, and community control of viral hepatitis.</li> <li>• Apply counselling and practical pharmacology skills in management of liver diseases.</li> <li>• Integrate pathology, pharmacology, clinical, and preventive knowledge for comprehensive patient care.</li> </ul>
<b>Subtheme 1: Hepatobiliary Pathologies &amp; Clinical Evaluation</b>			<ul style="list-style-type: none"> <li>• Describe clinical and pathological features of hepatobiliary disorders including cirrhosis, fatty liver, cholestasis, and liver neoplasms.</li> <li>• Explain gallbladder diseases (cholelithiasis, cholecystitis) and their complications.</li> <li>• Recognize clinical presentation of obstructive jaundice and ascites.</li> <li>• Develop structured clinical approach to patients with jaundice and ascites.</li> <li>• Interpret laboratory investigations (LFTs, bilirubin, imaging) in hepatobiliary diseases.</li> <li>• Differentiate between hepatocellular and obstructive patterns of liver disease.</li> <li>• Identify complications of chronic liver disease and portal hypertension.</li> </ul>
<b>Subtheme 2: Viral Hepatitis Management, Pharmacology &amp; Prevention</b>			<ul style="list-style-type: none"> <li>• Explain mechanisms, indications, and therapeutic use of antiviral drugs for Hepatitis B and C.</li> <li>• Apply rational drug therapy in viral hepatitis and chronic liver disease.</li> <li>• Demonstrate counselling skills for patients with hepatitis (transmission prevention, compliance).</li> <li>• Describe epidemiology and transmission patterns of viral hepatitis and foodborne infections.</li> <li>• Outline preventive strategies including vaccination, sanitation, and public health measures.</li> <li>• Integrate pharmacological, clinical, and community-based approaches in management.</li> <li>• Apply practical pharmacology skills in prescribing and monitoring therapy.</li> </ul>

## Specific Learning Objectives – WEEK 6

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGY	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
M-III-GIT-PATH-011	Neoplastic liver diseases	<ul style="list-style-type: none"> <li>• Discuss etiology, pathogenesis and morphology of Nodular Hyperplasia's, Hepatocellular Adenomas and Hepatoblastoma.</li> <li>• correlate the etiopathogenesis of HCC with changes in its precursor lesions.</li> <li>• Describe the morphology of liver neoplasm.</li> <li>• Describe the lab diagnosis of liver neoplasm.</li> </ul>	C2 C3 C2 C2	Must know Must know Need to know Need to know Must know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-008	Cholestasis and biliary diseases	<ul style="list-style-type: none"> <li>• Discuss pathophysiology of Jaundice, Cholestasis, large Bile Duct Obstruction autoimmune Cholangiopathies.</li> <li>• Differentiate between pathological features of Primary Biliary Cirrhosis (PBC) and Primary Sclerosing Cholangitis (PSC)</li> <li>• Discuss Structural Anomalies of the Biliary tree, biliary atresia.</li> <li>• Explain Portal Vein Obstruction and hepatic vein Thrombosis.</li> <li>• Correlate immunological basis with Graft-Versus-Host Disease and Liver Graft Rejection.</li> </ul>	C2 C3 C2 C2 C3	Need to know must know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-009	Liver Cirrhosis	<ul style="list-style-type: none"> <li>• Discuss causes, Pathogenesis and morphological features of Cirrhosis and Portal Hypertension.</li> <li>• Enumerate causes of chronic hepatitis.</li> <li>• Interpret morphological diagnosis of cirrhosis by neuroinflammatory grade and stage.</li> <li>• Correlate morphological diagnosis of cirrhosis with clinical outcome of disease.</li> <li>• correlate the hepatocellular and sinusoidal injury with complications of cirrhosis.</li> </ul>	C2 C2 C3 C3 C3	Need to know Must know	LGIS	MCQs SAQs SEQs EMQ VIVA

M-III-GIT-PATH-012	Gallbladder diseases	<ul style="list-style-type: none"> <li>Discuss morphological features of Congenital Anomalies.</li> <li>Describe etiology and pathogenesis and morphology of Cholelithiasis (Gallstones) and cholecystitis.</li> <li>Classify neoplastic lesions of gall bladder.</li> <li>Describe the morphology of gall bladder neoplasms</li> </ul>	C2 C2  C2 C2	Need to know must know Need to know	LGIS	MCQs SAQs SEQs EMQ VIVA
M-III-GIT-PATH-035	Laboratory diagnosis of hepatobiliary diseases	<ul style="list-style-type: none"> <li>Interpret lab report of a patient with chronic viral, hepatitis, acute viral hepatitis.</li> <li>Interpret lab report of a patient with jaundice.</li> <li>Describe the role of advance lab tests in diagnosing liver disease                             <ul style="list-style-type: none"> <li>Value the role of basic investigations in clinical management</li> </ul> </li> </ul>	C3  C3 P2 A3	Must know Need to know Need to know Need to know	SKILL	OSPE
M-III-GIT-PATH-035	Fatty liver disease	<ul style="list-style-type: none"> <li>Correlate the clinical features of fatty liver disease with its pathogenesis and morphology</li> <li>Describe the etiopathogenesis of fatty liver disease</li> <li>Describe the lab findings</li> <li>Counsel a patient with fatty liver.</li> </ul>	C2  C2 C3 P3	Must know  Need to know Need to know Need to know	CBL	PBQS
<b>PHARMACOLOGY</b>						
<b>MIII-GIT-PH-007</b>	Antiviral drugs focusing hepatitis C	<ul style="list-style-type: none"> <li>Discuss drug used for treatment of Hepatitis C viral infections</li> </ul> <p>Discuss the mechanism of action, uses and adverse effects of interferon</p>	C2  C 2	MUST KNOW	LGIS	MCQs SAQs SEQs EMQ VIVA
<b>MIII-GIT-PH-016</b>	Re enforcement of counselling and practical	<ul style="list-style-type: none"> <li>Develop effective communication skills to counsel patients and care givers about medication use, including dosage, administration, potential side effects, and adherence.</li> <li>Provide patient education on the mechanism of action and therapeutic goals of prescribed medications, facilitating informed decision-making</li> </ul>	P1  P2  P2	Should know	SKILL	OSPE

	skills	and treatment understanding. Address patient concerns and misconceptions about medication therapy, promoting trust, collaboration, and shared decision-making in healthcare decisions.				
<b>FORENSIC MEDICINE</b>						
<b>MIII-GIT-FM-009</b>	<b>Food poisoning</b> Botulism & Cholera (CBL)	<ul style="list-style-type: none"> <li>Classify the microbial classification implicated in Food poisoning.</li> <li>Briefly describe the non-microbial contamination of Food.</li> <li>Enlist the symptoms of food poisoning</li> <li>Enumerate the guidelines for stool collection and preservation in case of suspected food poisoning.</li> </ul> State the medico-legal importance of Food poisoning.	C1 C2 C2 C2 C2	MUST KNOW  MUST KNOW SHOULD KNOW MUST KNOW	SGD  (Practical)	MCQs SAQs SEQs EMQ VIVA  OSPE
<b>SURGERY</b>						
	Approach to a patient with Obstructive jaundice and hepatobiliary diseases	<ul style="list-style-type: none"> <li>Explain signs and symptoms of cholelithiasis, chronic cholecystitis, acute cholecystitis, cholangitis, pancreatitis and obstructive jaundice.</li> <li>Enlist a D/D for upper abdominal pain.</li> <li>Enlist a D/D for obstructive jaundice.</li> <li>Apply his theoretical knowledge to make a management plan for hepatobiliary diseases.</li> </ul>	C2  C1 C1 C3	LGIS	SEQS, MCQs, OSPE	
<b>MEDICINE</b>						
	Approach to a patient with Ascites	Able to define Ascites. Explain pathophysiology of Ascites. Describe etiology of Ascites. Classify different types of Ascites.	C2 A 3		LGIS/PPT	SEQS, MCQs, OSPE
	Approach to a patient with Jaundice	<ul style="list-style-type: none"> <li>Should be able to discuss and describe Bilirubin metabolism and pathophysiology of Jaundice as increased bilirubin production, decrease bilirubin uptake, obstruction in biliary tree.</li> </ul> Relevant questions to elaborate and differentiate between different causes of jaundice for example Pre-hepatic, hepatic and post hepatic Associated	C2 A 3		LGIS/PPT	SEQS, MCQs, OSPE

		symptoms of jaundice that clarify cause like anemia, loss of appetite, fever, dark urine, clay stools and pruritus				
<b>COMMUNITY MEDICINE</b>						
Epidemiology, Prevention, and Community Control of Viral Hepatitis	<ul style="list-style-type: none"> <li>Define viral hepatitis and identify the major types and their causative viruses.</li> <li>Describe the epidemiology and modes of transmission of different types of viral hepatitis.</li> <li>Recognize risk factors and high-risk populations for viral hepatitis.</li> <li>Explain preventive strategies including vaccination, sanitation, and safe practices.</li> <li>Apply community-based control measures and screening strategies to reduce the burden of viral hepatitis.</li> <li></li> </ul>	C1 C2 C3 C3 C3	MUST KNOW	LGIS	MCQs	
<b>BEHAVIOURAL SCIENCE</b>						

## Horizontally Integrated Basic Sciences (Pharmacology, Pathology & Forensic Medicine)

### Pharmacology Self Directed Learning (SDL)

Code	Topic	Learning objectives	Learning Domain	Calgary Gauge	References
MIII-GIT -PH-019	Development of Potassium competitive acid blockers in acid reflux disease	<ul style="list-style-type: none"> <li>Enlist potassium acid blockers</li> <li>Revise role of potassium in gastric acid production</li> <li>Compare the efficacy of PPIs and potassium acid blockers</li> </ul>	C1 C2 C3	MUST KNOW	<ol style="list-style-type: none"> <li><a href="https://pubmed.ncbi.nlm.nih.gov/33592125/">https://pubmed.ncbi.nlm.nih.gov/33592125/</a></li> <li>Basic and Clinical Pharmacology by Bertram Z. Katzung 15th Edition, Chapter 62, Page 1695-96</li> <li>Goodman and Gillman's The Pharmacological basics of Therapeutics, 13th Edition, Chapter 53, Pg. 1096-97</li> </ol>
MIII-GIT -PH-020	Role of dietary modifications in gut related diseases	<ul style="list-style-type: none"> <li>Revise the pathophysiology common gut diseases</li> <li>Role of dietary modifications in complementing pharmacological therapy of gut diseases</li> </ul>	C1 C3	MUST KNOW	<ol style="list-style-type: none"> <li><a href="https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2024.1324793/full">https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2024.1324793/full</a></li> <li><a href="https://pmc.ncbi.nlm.nih.gov/articles/PMC10862460/">https://pmc.ncbi.nlm.nih.gov/articles/PMC10862460/</a></li> </ol>
MIII-GIT -PH-021	Role of microbiome in cancer therapy	<ul style="list-style-type: none"> <li>Understand the basics of human microbiome</li> <li>Describe interaction between microbiome and immune system.</li> <li>Explain the impact of microbiome on cancer development.</li> </ul>	C1 C2 C3	MUST KNOW	<ol style="list-style-type: none"> <li><a href="https://link.springer.com/article/10.1186/s12885-021-08664-0">https://link.springer.com/article/10.1186/s12885-021-08664-0</a></li> <li><a href="https://www.medscape.com/viewarticle/999042?src=mbi_msp_android&amp;ref=share">https://www.medscape.com/viewarticle/999042?src=mbi_msp_android&amp;ref=share</a></li> </ol>

MIII-GIT -PH-022	Drug induced liver injuries	<ul style="list-style-type: none"> <li>Identify common drugs and agents associated with DILI</li> <li>Discuss the diagnostic approach and review the management and prevention strategies</li> <li>Examine case studies and current research.</li> </ul>	C1 C2 C3	MUST KNOW	1. <a href="https://www.medscape.com/viewarticle/861425?src=mbi_msp_android&amp;ref=share">https://www.medscape.com/viewarticle/861425?src=mbi_msp_android&amp;ref=share</a>
MIII-GIT -PH-023	New anti-viral drugs for hepatitis B and C	<ul style="list-style-type: none"> <li>Explain the pharmacokinetics and pharmacodynamics of new antiviral agents used for hep B and C</li> <li>Identify new antiviral drugs approved for Hep B and C treatment</li> <li>Describe pharmacological rationale for combination antiviral therapies for Hep B and C</li> <li>Evaluate pharmacological considerations in different patient population.</li> </ul>	C1 C2 C3 C3	MUST KNOW	1. <a href="https://www.medscape.com/viewarticle/999756?src=mbi_msp_android&amp;ref=share">https://www.medscape.com/viewarticle/999756?src=mbi_msp_android&amp;ref=share</a> 2. <a href="https://www.medscape.com/viewarticle/simplifying-hepatitis-b-2024a1000ff4?src=mbi_msp_android&amp;ref=share">https://www.medscape.com/viewarticle/simplifying-hepatitis-b-2024a1000ff4?src=mbi_msp_android&amp;ref=share</a> 3. <a href="https://www.medscape.com/viewarticle/preventing-hepatitis-b-reactivation-updated-clinical-2025a10005oi?src=mbi_msp_android&amp;ref=share">https://www.medscape.com/viewarticle/preventing-hepatitis-b-reactivation-updated-clinical-2025a10005oi?src=mbi_msp_android&amp;ref=share</a>

### PHARMACOLOGY SYLLABUS FOR LEARNING MANAGEMENT SYSTEM (LMS)

Week	Topic of LGIS & SGD	Topic of SDL	Learning objectives	Learning Domain	Calgary Gauge	Mode of assessment
01	Anti emetics Chemotherapy induced nausea and vomiting	Development of Potassium competitive acid blockers in acid reflux disease	<ul style="list-style-type: none"> <li>Enlist potassium acid blockers</li> <li>Revise role of potassium in gastric acid production</li> <li>Compare the efficacy</li> </ul>	C1 C1 C3	MUST KNOW	LMS based MCQ

			of PPIs and potassium acid blockers			
02	Drugs used in peptic ulcer Clinical presentation of Extrapyrasidal effects of metoclopramide Drugs used in IBD Laxatives Prokinetic	Role of dietary modifications in gut related diseases	<ul style="list-style-type: none"> <li>Revise the pathophysiology common gut diseases</li> <li>Role of dietary modifications in complementing pharmacological therapy of gut diseases</li> </ul>	C1 C3	MUST KNOW	LMS based MCQ
03	Pharmacological and life style modification in IBS Anti amoebic drugs	Role of microbiome in cancer therapy	<ul style="list-style-type: none"> <li>Understand the basics of human microbiome</li> <li>Describe interaction between microbiome and immune system.</li> <li>Explain the impact of microbiome on cancer development.</li> </ul>	C1 C2 C3	MUST KNOW	LMS based MCQ
04	Anti helminthic agents Drugs used in hepatitis B	Drug induced liver injuries	<ul style="list-style-type: none"> <li>Identify common drugs and agents associated with DILI</li> <li>Discuss the diagnostic approach and review the management and prevention strategies</li> <li>Examine case studies and current research.</li> </ul>	C1 C2 C3	MUST KNOW	LMS based MCQ

05	Drugs used in hepatitis C Anti diarrheal drugs Role of prebiotic and post biotics in gut motility	New anti-viral drugs for hepatitis B and C	<ul style="list-style-type: none"> <li>• Explain the pharmacokinetics and pharmacodynamics of new antiviral agents used for hep B and C</li> <li>• Identify new antiviral drugs approved for Hep B and C treatment</li> <li>• Describe pharmacological rationale for combination antiviral therapies for Hep B and C</li> <li>• Evaluate pharmacological considerations in different patient population.</li> </ul>	C1 C2 C3 C3	MUST KNOW	LMS based MCQ
----	---	--	---	----------------------	-----------	---------------

**(Knowledge)**  
**Pathology Self Directed Learning (SDL)**

Code	TOPIC	LEARNING OBJECTIVES at the end of the session student should be able to:	C/P/A	Calgary Gauge	REFERENCES
M-III-GIT-PATH-027	Oral lesions	<ul style="list-style-type: none"> <li>• Enlist cause of Aphthous Ulcers (Canker Sores)</li> <li>• Define pathogenesis of Herpes Simplex Virus Infections of oral cavity</li> <li>• Describe the Pathogenesis of Oral Candidiasis (Thrush).</li> <li>• Describe the pathogenesis and morphology of oral benign and malignant lesions</li> </ul>	C1 C1 C2 C2	Need to know must know	Robbins & Cotran Pathologic Basis of Disease, 10th Edition, ,Chapter 16 Pg. 731-733
M-III-GIT-PATH-028	Odontogenic cysts and Tumors	<ul style="list-style-type: none"> <li>• Pathogenesis of Dentigerous cyst</li> <li>• Pathogenesis of Odontogenic kerato-cysts</li> <li>• Pathogenesis of Periapical cysts</li> <li>• Pathogenesis of Odontogenic tumors</li> </ul>	C2 C2 C2 C2	Need to know Need to know	Robbins & Cotran Pathologic Basis of Disease, 10th Edition, ,Chapter 16 Pg.737

Code	TOPIC	LEARNING OBJECTIVES at the end of the session student should be able to:	C/P/A	Calgary Gauge	REFERENCES
		<ul style="list-style-type: none"> <li>• Pathogenesis of Ameloblastomas</li> <li>• Pathogenesis of Odontoma</li> </ul>	C2 C3	know Need to know Need to know	
M-III-GIT-PATH-029	Diarrheal disease	<ul style="list-style-type: none"> <li>• Enlist diseases causing diarrhea</li> <li>• Describe the pathogenesis of infectious diarrhea</li> <li>• Enlist the lab diagnosis of diarrhea</li> </ul>	C1 C2 C1	must know Need to know must know	Robins Basic Pathology 10th Edition Chapter 17, Page # 787-795
M-III-GIT-PATH-030	Jaundice and Cholestasis	<ul style="list-style-type: none"> <li>• Define Jaundice and revise LFTs</li> <li>• Describe the pathophysiology/of bilirubin metabolism</li> <li>• Explain Pathogenesis of Gilbert syndrome &amp; Dubbin-Johnson syndrome</li> <li>• Enlist disease causing jaundice in different age groups</li> </ul>	C1 C2 C2 C1	must know must know Need to know Need to know	Robbins & Cotran Pathologic Basis of Disease, 10th Edition, Chapter 18, Pg. 852- 856
M-III-GIT-PATH-031	Congenital abnormalities of large and small intestine	<ul style="list-style-type: none"> <li>• Describe the clinical presentation, pathophysiology, and complications of common congenital anomalies, Small Intestine: Meckel's diverticulum, atresia, stenosis, and malrotation.</li> <li>• Large Intestine: Hirschsprung disease, anorectal malformations, and colonic duplications.</li> <li>• Understand the role of imaging and pathology in diagnosis.</li> <li>• Explain the underlying mechanisms of intestinal obstruction and its implications in congenital malformations.</li> </ul>	C2 C2 C2 C3	Need to know  Must know Need to know  Nice to know	Robbins & Cotran Pathologic Basis of Disease, 10th Edition, Chapter 17, Pg. 605/606754-757

## PATHOLOGY SYLLABUS FOR LEARNING MANAGEMENT SYSTEM (LMS)

Sr #	Wks.	Topics of LGIS &SGD*	Topics Of SDL	Learning Objectives of SDL	C/P/A	Calgary Gauge	Mode of assessment
1.	Wk. 1	Oral Cavity & Salivary Gland diseases Esophagitis and non neoplastic lesions of esophagus Gastritis and Peptic Ulcer	Oral lesions	<ul style="list-style-type: none"> <li>Enlist cause of Aphthous Ulcers (Canker Sores)</li> <li>Define pathogenesis of Herpes Simplex Virus Infections of oral cavity</li> <li>Describe the Pathogenesis of Oral Candidiasis (Thrush).</li> <li>Describe the pathogenesis and morphology of oral benign and malignant lesions</li> </ul>	C1 C1 C2	Need to know Nice to know Nice to know Nice to know	LMS Based MCQS
		Skill Lab Salivary tumor, CA esophagus, peptic ulcer, CA stomach					
2.	Wk. 2	Neoplasms & polyps of stomach Intestinal obstruction & vascular diseases of small intestine	Odontogenic cysts and Tumors	<ul style="list-style-type: none"> <li>Pathogenesis of Dentigerous cyst</li> <li>Pathogenesis of Odontogenic kerato-cysts</li> <li>Pathogenesis of Periapical cyst</li> <li>Pathogenesis of Odontogenic tumors</li> <li>Pathogenesis of Ameloblastomas</li> <li>Pathogenesis of Odontoma</li> </ul>	C2 C2 C2 C2 C2	Nice to know Nice to know Nice to know Nice to know Nice to know	LMS Based MCQS
		Skill lab Acute appendicitis Intestinal TB Crohn' disease CA colon					

Sr #	Wks.	Topics of LGIS &SGD*	Topics Of SDL	Learning Objectives of SDL	C/P/A	Calgary Gauge	Mode of assessment
3.	Wk. 3	Inflammatory bowel disease Intestinal and urogenital protozoa Blood and tissue protozoa leishmania and Trypanosoma	Diarrheal disease	<ul style="list-style-type: none"> <li>Enlist diseases causing diarrhea</li> <li>Describe the pathogenesis of infectious diarrhea</li> <li>Enlist the lab diagnosis &amp; discuss clinical scenario of diarrhea</li> </ul>	C2 C2 C2 C3	Must know Need to know must know Need to know	LMS Based MCQS
		Skill Lab Stool examination/ Parasitology (practical)					
4	Wk.4	Intestinal cestodes Trematodes Intestinal Nematodes Tissue nematodes	Jaundice and Cholestasis	<ul style="list-style-type: none"> <li>Define Jaundice and revise LFTs</li> <li>Describe the pathophysiology/of bilirubin metabolism</li> <li>Explain Pathogenesis of Gilbert syndrome &amp; Dubbin-Johnson syndrome</li> <li>Enlist disease causing jaundice in different age groups also discuss clinical scenario</li> </ul>	C2 C2  C2  C3	must know must know Need to know Need to know  Nice to know	LMS Based MCQS
		Skill lab Fatty change, Cirrhosis, CA liver					

Sr #	Wks.	Topics of LGIS &SGD*	Topics Of SDL	Learning Objectives of SDL	C/P/A	Calgary Gauge	Mode of assessment
5	Wk. 5	Colorectal carcinoma Colonic polyps Cholestasis and biliary diseases	Congenital abnormalities of large and small intestine	<ul style="list-style-type: none"> <li>Describe the clinical presentation, pathophysiology, and complications of common congenital anomalies, Small Intestine: Meckel's diverticulum, atresia, stenosis, and malrotation.</li> </ul>	C2	Need to know	
				<ul style="list-style-type: none"> <li>Large Intestine: Hirschsprung disease, anorectal malformations, and colonic duplications.</li> </ul>	C2	Nice to know	
				<ul style="list-style-type: none"> <li>Understand the role of imaging and pathology in diagnosis.</li> </ul>	C2	Nice to know	
				<ul style="list-style-type: none"> <li>Explain the underlying mechanisms of intestinal obstruction and its implications in congenital malformations.</li> </ul>	C2	Nice to know	
6	Wk. 6	Gallbladder diseases Types of hepatitis and metabolic liver diseases Diseases of Pancreas Neoplastic liver diseases	Tumors of endocrine and exocrine pancreas	<ul style="list-style-type: none"> <li>Differentiate between endocrine tumors (e.g., insulinoma, glucagonoma, gastrinoma) and exocrine tumors (e.g., pancreatic ductal adenocarcinoma, acinar cell carcinoma)</li> </ul>	C2	Need to know	
		Skill lab Laboratory diagnosis of hepatobiliary diseases		<ul style="list-style-type: none"> <li>Identify the signs, symptoms, and paraneoplastic syndromes associated with pancreatic tumors</li> </ul>	C3	Nice to know	

Sr #	Wks.	Topics of LGIS &SGD*	Topics Of SDL	Learning Objectives of SDL	C/P/A	Calgary Gauge	Mode of assessment
				<ul style="list-style-type: none"> <li>Learn about the diagnostic methods including imaging (CT, MRI), tumor markers (CA 19-9, chromogranin A), and biopsy and discuss related clinical scenario</li> </ul>			

**(Knowledge)**  
**Forensic Medicine Self Directed Learning (SDL)**

Code	Topic	Learning objectives	Calgary Gauge	References
MIII-GIT - FM-010	General Toxicology-II	<ul style="list-style-type: none"> <li>Enlist different sign and symptoms of poisoning</li> <li>Briefly describe the diagnostic criteria of poisoning both in living and dead.</li> <li>Define an antidote and Classify antidotes</li> <li>Describe the uses of various antidotes in respective poisoning.</li> <li>State the composition of a universal antidote and its uses</li> </ul>	MUST KNOW  MUST KNOW SHOULD KNOW MUST KNOW	Essential: Parikhs" text book of forensic and toxicology PAGE NO 507-519 Recommended: Principles of Forensic Medicine & Toxicology by Gautam Biswas
MIII-GIT - FM-011	General Toxicology-III	<ul style="list-style-type: none"> <li>Enlist the steps of management of a case of poisoning</li> <li>Describe the role of elimination of unabsorbed poison</li> <li>Briefly describe the procedure of gastric</li> </ul>	MUST KNOW  MUST KNOW SHOULD KNOW MUST KNOW	Essential: Parikhs" text book of forensic and toxicology PAGE NO 507-519 Recommended: Principles of Forensic Medicine & Toxicology by Gautam Biswas

Code	Topic	Learning objectives	Calgary Gauge	References
		lavage along with its indications, contraindications and complications <ul style="list-style-type: none"> <li>State the role of elimination of absorbed poison with special emphasis on forced diuresis and exchange transfusion</li> </ul> Briefly describe the duties of medical practitioner in a case of suspected poisoning		
MIII-GIT - FM-012	Medicolegal Autopsy I & II	Define medicolegal autopsy Classify autopsy and narrate the objectives of medicolegal autopsy. Briefly state the autopsy protocol and its requirements. Describe the contents of a medicolegal autopsy report and its procedure <ul style="list-style-type: none"> <li>Describe the procedure of exhumation and its Forensic Importance.</li> <li>Briefly explain examination of mutilated and decomposed bodies</li> </ul> Define Postmortem artifacts and its type w.r.t their medico-legal importance	MUST KNOW MUST KNOW SHOULD KNOW MUST KNOW	Essential:Parikhs”text book of forensic and toxicology PAGE NO 94 TO 112 Recommended: Principles of Forensic Medicine & Toxicology by GautamBiswas
MIII-GIT - FM-013	Medicinal poisons (acetamol& Aspirin) Food poisoning Botulism & Cholera	<ul style="list-style-type: none"> <li>Enlist the types of Analgesics used commonly as self harm</li> <li>Briefly describe the clinical presentation of analgesic intoxication</li> <li>Explain the management of acute analgesic intoxication in general</li> <li>State the Medicolegal importance of analgesic intoxication</li> <li>Classify the microbial classification implicated in Food poisoning.</li> <li>Briefly describe the non-microbial</li> </ul>	MUST KNOW MUST KNOW SHOULD KNOW MUST KNOW	Essential:Parikhs”text book of forensic and toxicology PAGE NO 94 TO 112 Recommended: Principles of Forensic Medicine & Toxicology by GautamBiswas  Essential:Parikhs”text book of forensic and toxicology PAGE NO 689 TO 691 Recommended: Principles of

Code	Topic	Learning objectives	Calgary Gauge	References
		contamination of Food. <ul style="list-style-type: none"> <li>• Enlist the symptoms of food poisoning</li> <li>• Enumerate the guidelines for stool collection and preservation in case of suspected food poisoning.</li> </ul> State the medico-legal importance of Food poisoning		Forensic Medicine & Toxicology by Gautam Biswas

### FORENSIC MEDICINE SYLLABUS FOR LEARNING MANAGEMENT SYSTEM (LMS)

Week	topic of LGIS SGDS	Topics of SDL	Learning objectives	Learning Resources	Mode of assessment
1.	<b>General Toxicology-II</b> Signs and symptoms of common poisoning	<b>General Toxicology-II</b>	<ul style="list-style-type: none"> <li>• Enlist different sign and symptoms of poisoning</li> <li>• Briefly describe the diagnostic criteria of poisoning both in living and dead.</li> <li>• Define an antidote and Classify antidotes</li> <li>• Describe the uses of various antidotes in respective poisoning.</li> <li>• State the composition of a universal antidote and its uses</li> </ul>	Essential: Parikhs' text book of forensic and toxicology PAGE NO 507-519 Recommended: Principles of Forensic Medicine & Toxicology by Gautam Biswas	LMS Based MCQS

<b>2.</b>	<b>General Toxicology-III</b> Management of poisoning & Medico legal duties of a Doctor in case of poisoning	<b>General Toxicology-III</b>	<ul style="list-style-type: none"> <li>• Enlist the steps of management of a case of poisoning</li> <li>• Describe the role of elimination of unabsorbed poison</li> <li>• Briefly describe the procedure of gastric lavage along with its indications, contraindications and complications</li> <li>• State the role of elimination of absorbed poison with special emphasis on forced diuresis and exchange transfusion</li> <li>• Briefly describe the duties of medical practitioner in a case of suspected poisoning</li> </ul>	Essential:Parikhs”text book of forensic and toxicology PAGE NO 507-519 Recommended: Principles of Forensic Medicine & Toxicology by GautamBiswas	LMS Based MCQS
<b>3.</b>	<b>Medicolegal Autopsy-I</b> Introduction, Types, Protocol, Objectives & procedure <b>Medicolegal Autopsy-II</b> (Exhumation & postmortem artifacts autopsy)	<b>Medicolegal Autopsy-I&amp;II</b>	<ul style="list-style-type: none"> <li>• Define medicolegal autopsy</li> <li>• Classify autopsy and narrate the objectives of medicolegal autopsy.</li> <li>• Briefly state the autopsy protocol and its requirements.</li> </ul> Describe the contents of a medicolegal autopsy report and its procedure	<b>Essential:</b> Parikhs”text book of forensic and toxicology PAGE NO 94 TO 112 <b>Recommended:</b> Principles of Forensic Medicine & Toxicology by GautamBiswas	LMS Based MCQS
<b>4.</b>	<b>Medicinal poisons</b> (Paracetamol& Aspirin)(CBL) <b>Food poisoning</b> Botulism &Cholera(CBL)	<b>Medicinal poisons</b> (Paracetamol& Aspirin) <b>Food poisoning</b> Botulism & Cholera	<ul style="list-style-type: none"> <li>• Describe the procedure of exhumation and its Forensic Importance.</li> <li>• Briefly explain examination of mutilated and decomposed bodies</li> <li>• Define Postmortem artifacts and its type w.r.t their medico-legal importance</li> <li>• Enlist the types of Analgesics used commonly as self harm</li> <li>• Briefly describe the clinical presentation</li> </ul>	<b>Essential:</b> Parikhs”text book of forensic and toxicology PAGE NO 94 TO 112 <b>Recommended:</b> Principles of Forensic Medicine & Toxicology by GautamBiswas	LMS Based MCQS

			<p>of analgesic intoxication</p> <ul style="list-style-type: none"> <li>• Explain the management of acute analgesic intoxication in general</li> <li>• State the Medicolegal importance of analgesic intoxication</li> <li>• Classify the microbial classification implicated in Food poisoning.</li> <li>• Briefly describe the non-microbial contamination of Food.</li> <li>• Enlist the symptoms of food poisoning</li> <li>• Enumerate the guidelines for stool collection and preservation in case of suspected food poisoning.</li> <li>• State the medico-legal importance of Food poisoning</li> </ul>	<p><b>Essential:</b>Parikhs”text book of forensic and toxicology PAGE NO 689 TO 691</p> <p><b>Recommended:</b> Principles of Forensic Medicine &amp; Toxicology by GautamBiswas</p>	
--	--	--	---	---	--

### DISTRIBUTION OF TEACHING HOURS OF DISCIPLINES

SR. NO.	DISCIPLINES	LGIS	SGD	CBL	SDL	HOURS
1.	Pharmacology	11	3	2	5	21
2.	Pathology	15	10	5	5	35
3.	Forensic Medicine	4	-	2	5	7
4.	Surgery	5				
5.	Medicine	7				
6.	Community Medicine	8				
7.	Family Medicine	2				
	Research	4				
9.	Behavioral Sciences	3				
	<b>Total hours</b>	<b>59</b>	<b>13</b>	<b>9</b>	<b>15</b>	<b>96</b>

### PRACTICAL & CLERKSHIP HOURS

DISCIPLINES	PRACTICAL HOURS	DISCIPLINES	CLERKSHIP HOURS
Pharmacology	2x5 = 10 hrs.	Surgery	2.5 x 20 = 50hrs
Pathology	2x5 = 10 hrs.	Medicine	2.5 x 20 = 50hrs
Forensic Medicine	2x3 = 06 hrs.	Subspecialty	2.5 x 20= 50hrs

LGIS \* SGD\*\* CBL\*\*\* SDL\*\*\*\*

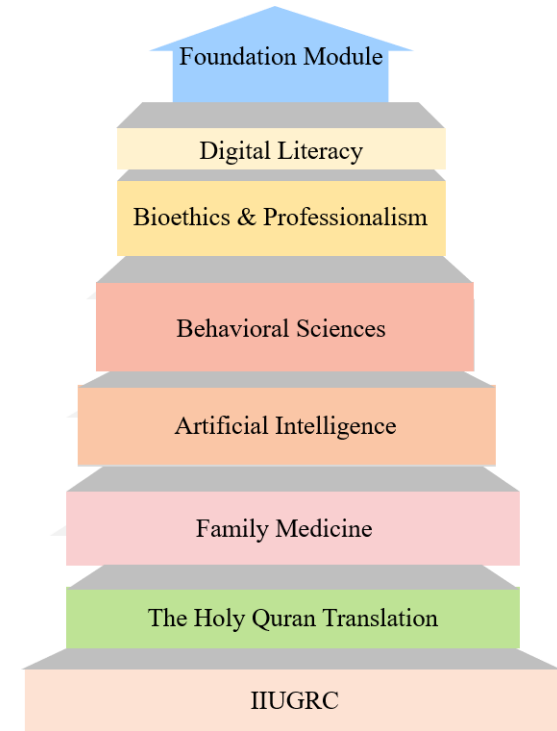
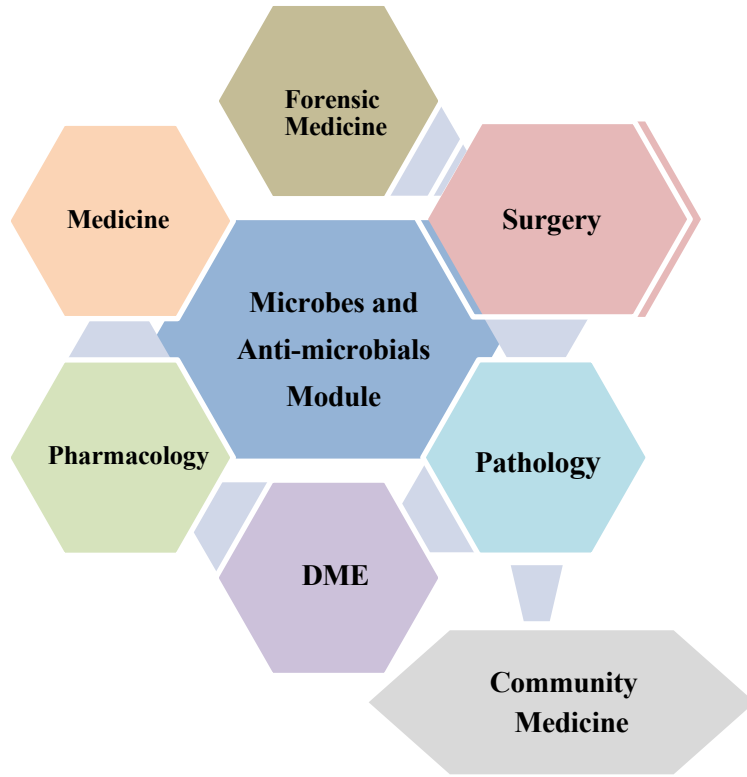
**RMU – 12 Integrated Modular MBBS Curriculum 2026**  
**Isolation to *Beyond Boundaries***

**Third Year MBBS 2026**

**BLOCK IX**

**Microbes & Anti microbes Module**

## Integration of Disciplines in Microbes and Anti-Microbials Modu



**Spiral / General Education Cluster Courses**

### Microbes & Anti-Microbial Team

Module Name : Microbes and Antimicrobial Module  
 Duration of module : 06 Weeks  
 Coordinator : Dr. Kiran Fatima  
 Co-coordinator : Dr. Iqbal Haider  
 Reviewed by : Module Committee

Module Committee		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar
2.	Principial	Prof. Dr. Muhammad Khurram
3.	Convener Curriculum	Prof. Dr. Naeem Akhter
4.	Dean Basic Sciences	Prof. Dr. Ayesha Yousaf
5.	Director DME	Prof. Dr. Ifra Saeed
6.	Chairperson Pharmacology & Implementation Incharge 3 <sup>rd</sup> year MBBS	Dr Zunera Hakim
7.	Chairperson Pathology	Dr Fatima Tuz Zahra
8.	Chairperson Forensic Medicine	Dr Shahida
9.	Focal Person Pharmacology	Dr Attiya
10.	Focal Person Pathology	Dr Shabih Haider
11.	Focal Person Forensic Medicine	Dr. Filza
12.	Focal Person Medicine	Dr. Saima Ambreen
13.	Focal Person of Gynaecology	Dr. Hina
14.	Focal Person Community Medicine	Dr. Afifa Kulsoom
15.	Focal Person Quran Translation Lectures	Mufti Abdul Wahid
16.	Focal Person Family Medicine	Dr. Sadia Khan
17.	Focal Person Bioethics Department	Prof. Dr. Akram Randhawa
18.	Focal Person Surgery	Dr. Rahat Hasan

Module Task Force Team		
1.	Coordinator	Dr. Mohammad Shabih Haider (Demonstrator of Pathology)
2.	DME Focal Person	Dr. Maryum Batool
3.	Co-coordinator	Dr. Syed Iqbal Haider (APMO of Pathology)
DME Implementation Team		
1.	Director DME	Prof. Dr. Ifra Saeed
2.	Deputy Director DME	Dr. Sadia Chaudhry
3.	Module planner & Implementation coordinator	Dr. Omaima Asif
4.	Editor	Dr. OmaimaAsif

## Introduction

**Microbes and Anti-Microbial** module provides integration of core concepts that underlie the basic science/pathology of Microbial diseases and their use in clinical medicine. This will eventually lead to develop critical thinking for integration and application of basic knowledge for clinical application.

**Rationale:** To establish strong foundations for antimicrobial stewardship to promote appropriate use of antimicrobials thus improving patient outcomes in clinical practice with consequent reduction in microbial resistance and eventually decreased spread of multidrug resistant organisms. Diseases prevalent in Pakistan are also discussed in the form of seminar. In this module students will attend seminar on DENGUE & TYPHOID..

### Module Outcomes

Each student will be able to:

#### Knowledge

Acquire knowledge about the basic terminologies used in Pharmacology, Pathology & Forensic Medicine as well as the concepts of diseases in the community

Appreciate concepts & importance of

- Research
- Biomedical Ethics
- Family Medicine
- Use technology based medical education including Artificial Intelligence.

#### Skills

Interpret and analyze various practical of Pre-clinical Sciences

#### Attitude

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

This module will run in 7 weeks duration. The content will be covered through introduction of topics. 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!

## MICROBES & ANTI-MICROBIALS MODULE

**Duration 06 Weeks**

Week	Theme number	Theme Topics	Subthemes
Week 1	Theme 1	Introduction to Microbial Pathogenesis and Therapeutics	<ol style="list-style-type: none"> <li>1. Microbial Biology and Pathogenesis</li> <li>2. Therapeutic Approaches and Clinical Management</li> </ol>
Week 2	Theme 2	Microbes, Medicines, and Modern Prevention	<ol style="list-style-type: none"> <li>1. Microbial World and Diagnostics</li> <li>2. Therapeutics, Prevention, and Public Health</li> </ol>
Week 3	Theme 3	Pathological Foundations of Infectious and Toxicological Disorders	<ol style="list-style-type: none"> <li>1. Microbial Identification and Laboratory Correlates</li> <li>2. Clinical-Pathological Insights into Infections and Toxic Exposures</li> </ol>
Week 4	Theme 4	Bridging Microbes, Toxins, and Holistic Patient Care	<ol style="list-style-type: none"> <li>1. Pathogens and Antimicrobial Strategies</li> <li>2. Toxicology, Ethics, and Psychosocial Health</li> </ol>
Week 5	Theme 5	Viral and Fungal Infections: Diagnostics, Therapeutics, and Toxicology	<ol style="list-style-type: none"> <li>1. Viral Infections: Laboratory and Clinical Perspectives</li> <li>2. Fungal Infections and Toxicological Cases</li> </ol>
Week 6	Theme 6	Infectious Frontiers: Fungi, Viruses, and Toxic Insights	<ol style="list-style-type: none"> <li>1. Clinically Significant Viral Infections</li> <li>2. Fungal Infections and Toxicological Cases</li> </ol>

## WEEK 1

WEEK	Theme / Subtheme	General Learning Outcomes (GLOs) (Aligned with Pathology, Pharmacology, Medicine, Surgery, Family Medicine)	Rationale
<b>WEEK 1</b>	<b>Theme: Introduction to Microbial Pathogenesis and Therapeutics</b>	<p>By the end of the week, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the structure, metabolism, and genetics of microorganisms relevant to human disease.</li> <li>2. Explain mechanisms by which microbes cause infections and host responses.</li> <li>3. Identify laboratory methods for diagnosing bacterial infections.</li> <li>4. Discuss principles of antimicrobial therapy, including drug selection and rational use.</li> <li>5. Recognize ethical considerations in the management of infectious diseases.</li> </ol>	<p>Infectious diseases are a major cause of morbidity and mortality worldwide. Understanding microbial biology, disease mechanisms, and therapeutic interventions equips students with the foundation for clinical decision-making. Integrating pathology, pharmacology, medicine, surgery, and family medicine enhances the ability to diagnose, treat, and ethically manage infections. This foundation promotes safe antimicrobial use, effective patient care, and an interdisciplinary approach to infectious disease management.</p> <p>Understanding microbial biology and pathogenesis is essential for interpreting disease presentations, anticipating complications, and guiding laboratory testing. Knowledge of bacterial genetics and growth informs rational antibiotic selection and helps in understanding resistance patterns.</p>
	<b>Subtheme 1: Microbial Biology and Pathogenesis</b>	<p>By the end of this section, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe bacterial structure, metabolism, and growth patterns.</li> <li>2. Explain bacterial genetics and mechanisms of antibiotic resistance.</li> <li>3. Discuss how microorganisms cause disease and evade host defenses.</li> <li>4. Identify common laboratory techniques used in microbial diagnosis.</li> <li>5. Correlate microbial characteristics with clinical manifestations of infection.</li> </ol>	<p>Knowledge of therapeutic approaches enables safe and effective management of infections. Integrating pharmacology, medicine, and surgery ensures students understand drug selection, dosing, and the role of interventions. Ethical considerations emphasize patient-centered care and responsible antimicrobial stewardship, critical in modern clinical practice.</p>

	<p><b>Subtheme 2: Therapeutic Approaches and Clinical Management</b></p>	<p>By the end of this section, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe major classes of antimicrobial agents and their mechanisms of action.</li> <li>2. Explain pharmacokinetics and pharmacodynamics of key antibiotics, e.g., penicillins.</li> <li>3. Apply principles of rational antibiotic use based on microbial susceptibility.</li> <li>4. Recognize surgical and medical management strategies for infectious diseases.</li> <li>5. Discuss ethical considerations in patient care, including informed consent and public health responsibilities.in patient care, including informed consent and public health responsibilities.</li> </ol>	
<p><b>WEEK 2</b></p>	<p><b>Theme: Microbes, Medicines, and Modern Prevention</b></p>	<p>By the end of the week, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe microbial structure, growth, and pathogenesis relevant to human infections.</li> <li>2. Explain mechanisms of antimicrobial action, resistance, and vaccination.</li> <li>3. Identify clinical presentations and laboratory methods for diagnosing infections.</li> <li>4. Apply rational antimicrobial therapy and pharmacovigilance principles.</li> <li>5. Recognize preventive measures including infection control,</li> </ol>	<p>Infectious diseases continue to pose major challenges in healthcare. This theme integrates microbiology, pharmacology, clinical medicine, surgery, paediatrics, forensic medicine, and community health to prepare students for diagnosis, treatment, and prevention. Knowledge of antimicrobial therapy, resistance, vaccines, and environmental/public health measures ensures safe and effective management of infections while emphasizing ethical practice and stewardship.</p> <p>Understanding microbes and diagnostic techniques is essential for recognizing infections, predicting complications, and guiding laboratory investigations. Sterilization and disinfection knowledge promotes patient safety and infection control.</p>

		<p>environmental hygiene, and ethical considerations.</p>	<p>Knowledge of antimicrobials, preventive strategies, and public health interventions equips students to manage infections safely and effectively. Integrating clinical care, pharmacology, community health, and forensic medicine ensures comprehensive understanding of treatment, prevention, and ethical responsibilities in healthcare.</p>
<p><b>Subtheme 1: Microbial World and Diagnostics</b></p>	<p>By the end of this section, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe bacterial morphology, growth patterns, and pathogenesis.</li> <li>2. Explain microbial resistance mechanisms and susceptibility testing.</li> <li>3. Identify laboratory techniques including microscopy and culture for infectious agents.</li> <li>4. Discuss sterilization, disinfection, and safe handling of pathogens.</li> <li>5. Correlate microbial characteristics with clinical and epidemiological presentations (e.g., Brucellosis, Staphylococci, Neonatal Tetanus).</li> </ol>		
<p><b>Subtheme 2: Therapeutics, Prevention, and Public Health</b></p>	<p>By the end of this section, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe major classes of antibiotics (Cephalosporins, Carbapenems, Vancomycin, Fluoroquinolones) and their mechanisms of action.</li> <li>2. Apply principles of rational drug use, prescription writing, and pharmacovigilance.</li> <li>3. Discuss clinical management of infections across medicine, surgery, and paediatrics.</li> <li>4. Explain preventive measures including vaccination, infection control,</li> </ol>		

		waste disposal, and healthful housing. 5. Recognize the impact of toxic exposures (Alcohol, Methyl Alcohol, OPC) and ethical considerations in public health.	
<b>WEEK 3</b>	<b>Theme: Pathological Foundations of Infectious and Toxicological Disorders</b>	<ul style="list-style-type: none"> <li>• Identify Gram-positive and Gram-negative bacteria using staining and culture techniques (Pathology).</li> <li>• Describe lab characteristics of Enterobacteriaceae, Klebsiella, Shigella, and Vibrio (Pathology).</li> <li>• Prescribe appropriate drugs based on pathological and microbial findings (Pharmacology).</li> <li>• Correlate pathological findings with clinical presentations in enteric fever, diarrhea, infections in pregnancy, and pediatric cases (Medicine, Family Medicine).</li> <li>• Understand pathological changes in toxic exposures and their clinical management (Forensic Medicine, Surgery).</li> </ul>	<p>This theme integrates microbial identification, pathological morphology, and laboratory diagnostics with clinical and toxicological applications, providing a holistic framework for understanding infectious and toxicological disorders. It emphasizes the laboratory-based characterization of microbes, including Gram staining, culture techniques, and morphological analysis, and demonstrates how these findings guide rational pharmacological decisions. Additionally, it focuses on applying pathological knowledge to clinical scenarios, such as enteric fever, diarrhea, infections in pregnancy, and pediatric cases, as well as toxic exposures like wheat pill and metallic/arsenic poisoning. By bridging laboratory findings with patient presentations, this integrated approach enables students to develop a clear understanding of the pathophysiology, diagnostic reasoning, and interdisciplinary management required for effective patient care.</p>
	<b>Subtheme 1: Microbial Identification and Laboratory Correlates</b>	<ul style="list-style-type: none"> <li>• Identify Gram-positive and Gram-negative bacteria using staining techniques (Pathology).</li> <li>• Describe morphology and lab characteristics of Enterobacteriaceae, Klebsiella, Shigella, and Vibrio (Pathology).</li> </ul>	

		<ul style="list-style-type: none"> <li>• Explain principles and interpretation of culture media (Pathology).</li> </ul>	
	<p><b>Subtheme 2: Clinical-Pathological Insights into Infections and Toxic Exposures</b></p>	<ul style="list-style-type: none"> <li>• Correlate pathological findings with clinical presentations of enteric fever, diarrhea, and infections in pregnancy (Medicine, Family Medicine).</li> <li>• Analyze pediatric and adult cases using lab and clinical data (Medicine, Family Medicine).</li> <li>• Recognize pathological changes associated with toxic exposures such as wheat pill and metallic/arsenic poisoning (Forensic Medicine, Surgery).</li> <li>• Prescribe appropriate drugs based on pathological and microbial findings (Pharmacology).</li> </ul>	
<p><b>WEEK 4</b></p>	<p><b>Theme: Bridging Microbes, Toxins, and Holistic Patient Care</b></p>	<ol style="list-style-type: none"> <li>1. Integrate microbiology, pathology, pharmacology, toxicology, behavioral sciences, and ethics into patient care.</li> <li>2. Recognize microbial, toxicological, and environmental factors affecting health.</li> <li>3. Apply rational drug therapy based on lab and clinical findings.</li> <li>4. Identify psychosocial and ethical challenges in patient management.</li> <li>5. Analyze case-based scenarios involving infections, poisonings, and behavioral disorders.</li> <li>6. Promote preventive measures and</li> </ol>	<p>This theme, “<b>Bridging Microbes, Toxins, and Holistic Patient Care,</b>” is designed to integrate the multiple dimensions of modern clinical training, linking microbiology, pathology, pharmacology, toxicology, behavioral sciences, ethics, and community health into a cohesive learning experience. Students are guided to understand the morphology, staining characteristics, and pathogenic mechanisms of key bacterial and viral agents such as <i>H. pylori</i>, <i>Campylobacter</i>, <i>Rickettsia</i>, <i>Chlamydia</i>, spirochetes, poliomyelitis virus, and rabies virus, and to correlate these laboratory findings with clinical presentations, including atypical pneumonia and enteric fever. The pharmacological component emphasizes rational antimicrobial selection and stewardship,</p>

		<p>public health awareness.                      7. Demonstrate interdisciplinary clinical reasoning.                      8. Communicate findings effectively for holistic patient management.</p>	<p>promoting evidence-based prescription practices tailored to laboratory and clinical data. In parallel, the theme addresses the mechanisms, clinical manifestations, and forensic implications of metallic and non-metallic poisons, fostering skills in the recognition, laboratory diagnosis, and safe management of toxic exposures. Behavioral and psychosocial aspects, including Obsessive Compulsive Disorder, Post-Traumatic Stress Disorder, and psycho-trauma, are incorporated to highlight the importance of mental health in patient care, while medical ethics sessions on errors and patient safety encourage critical reflection and ethical decision-making. Environmental and public health considerations, such as the impact of light, noise, and meteorological factors, further broaden the perspective, linking individual patient care to community well-being. By weaving together these diverse yet interconnected disciplines, this theme enables students to develop a holistic approach to patient management, emphasizing interdisciplinary reasoning, preventive strategies, and comprehensive care that addresses microbial, toxicological, behavioral, ethical, and environmental determinants of health.</p>
	<p><b>Subtheme 1:                      Pathogens and Antimicrobial Strategies</b></p>	<ol style="list-style-type: none"> <li>1. Describe Gram-negative rods, spirochetes, and other pathogen morphology.</li> <li>2. Explain pathogenesis, virulence, and clinical presentation of H. pylori, Campylobacter, Rickettsia, Chlamydia, poliomyelitis, and rabies virus.</li> <li>3. Perform Gram and Zn staining and interpret results.</li> <li>4. Apply rational drug prescriptions for atypical pneumonia and enteric fever.</li> <li>5. Correlate lab findings with clinical symptoms for accurate diagnosis.</li> <li>6. Understand zoonotic disease transmission and public health implications.</li> <li>7. Compare bacterial and viral infections regarding management and prognosis.</li> <li>8. Develop critical thinking for antimicrobial stewardship.</li> </ol>	
	<p><b>Subtheme 2:                      Toxicology, Ethics, and Psychosocial Health</b></p>	<ol style="list-style-type: none"> <li>1. Describe mechanisms of toxicity of metallic (Hg, Cu, Zn, Pb) and non-metallic poisons (Phosphorus).</li> <li>2. Recognize clinical signs and lab diagnosis of poisonings.</li> </ol>	

		<ol style="list-style-type: none"> <li>3. Understand forensic implications of toxic exposures.</li> <li>4. Identify medical errors and apply ethical principles to prevent harm.</li> <li>5. Describe behavioral disorders (OCD, PTSD) and psycho-trauma management.</li> <li>6. Analyze environmental factors (light, noise, meteorological) affecting health.</li> <li>7. Apply preventive and safety measures in clinical and community settings.</li> <li>8. Integrate toxicology, ethics, and psychosocial considerations in holistic patient care.</li> </ol>	
<p><b>WEEK 5</b></p>	<p><b>Theme: Viral and Fungal Infections: Diagnostics, Therapeutics, and Toxicology</b></p>	<ol style="list-style-type: none"> <li>1. Recognize major viral and fungal pathogens affecting humans.</li> <li>2. Understand laboratory methods for pathogen identification (biochemical &amp; molecular).</li> <li>3. Correlate lab findings with clinical presentations.</li> <li>4. Describe pharmacological interventions for viral and fungal infections.</li> <li>5. Interpret toxicological and forensic case scenarios.</li> <li>6. Integrate pathology, pharmacology, and forensic knowledge in patient care.</li> <li>7. Apply preventive and therapeutic strategies effectively.</li> </ol>	<p>This theme, “<b>Viral and Fungal Infections: Diagnostics, Therapeutics, and Toxicology,</b>” provides an integrated, multidisciplinary framework that bridges microbiology, pathology, pharmacology, and forensic medicine. It focuses on equipping students with the knowledge and skills necessary to identify, diagnose, and manage infections caused by key viral pathogens, including Measles, Mumps, Rubella, Herpes viruses (HSV/Shingles), and HIV/AIDS, as well as fungal pathogens responsible for cutaneous, subcutaneous, and systemic mycoses.</p> <p>By engaging with laboratory-based biochemical and molecular diagnostic techniques such as ELISA, PCR, ICT, and classical biochemical tests (Catalase, Coagulase, Urease, Oxidase, Indole, Citrate), students learn to interpret results accurately and relate them to clinical presentations. This enables them to make informed</p>

	<p><b>Subtheme 1: Viral Infections: Laboratory and Clinical Perspectives</b></p>	<ol style="list-style-type: none"> <li>1. Identify common viral pathogens: Measles, Mumps, Rubella, Herpes, HIV/AIDS.</li> <li>2. Describe viral life cycles relevant to disease progression.</li> <li>3. Perform and interpret biochemical and molecular tests (ELISA, PCR, ICT).</li> <li>4. Correlate lab results with clinical manifestations.</li> <li>5. Explain pharmacological interventions: antivirals I–III.</li> <li>6. Discuss preventive strategies and vaccination impacts.</li> <li>7. Interpret case-based scenarios of viral infections.</li> <li>8. Recognize complications and immunodeficiency associations.</li> </ol>	<p>decisions about patient management and rational drug use, including antiviral and antifungal therapies.</p> <p>The inclusion of forensic medicine components, such as methyl alcohol poisoning and plant-based toxic exposures (Castor, Croton, Capsicum, Ergot, Abrus), allows students to connect clinical and laboratory findings with medico-legal investigations. This integration highlights the importance of toxicological assessment, postmortem analysis, and medico-legal documentation in ensuring comprehensive healthcare and public safety.</p> <p>Overall, this theme emphasizes critical thinking, problem-solving, and interdisciplinary collaboration, enabling students to synthesize laboratory data, pharmacological knowledge, and forensic insights for holistic patient care. By the end of the week, learners are expected to not only identify and manage viral and fungal infections but also to understand their broader implications in clinical, community, and legal contexts, fostering a deeper appreciation of the interconnectedness of microbiology, therapeutics, and public health.</p>
	<p><b>Subtheme 2: Fungal Infections and Toxicological Cases</b></p>	<ol style="list-style-type: none"> <li>1. Identify fungal pathogens causing cutaneous, subcutaneous, and systemic mycoses.</li> <li>2. Understand lab tests for fungal identification (biochemical &amp; molecular).</li> <li>3. Describe antifungal pharmacology (Agents I–II).</li> <li>4. Link pathology findings to clinical management.</li> <li>5. Recognize common toxic exposures: methyl alcohol, castor, croton, capsicum, ergot, abrus.</li> <li>6. Explain medico-legal aspects of</li> </ol>	

		<p>forensic toxicology.</p> <p>7. Integrate lab, clinical, and forensic data for patient care.</p> <p>8. Discuss preventive and therapeutic strategies in fungal and toxicological cases.</p>	
<b>WEEK 6</b>	<b>Theme: Infectious Frontiers: Fungi, Viruses, and Toxic Insights</b>	<ol style="list-style-type: none"> <li>1. Understand the laboratory, pathological, and clinical aspects of fungal and viral infections.</li> <li>2. Integrate toxicology knowledge with clinical and forensic practice.</li> <li>3. Correlate lab findings with patient management and therapeutic decisions.</li> <li>4. Apply evidence-based pharmacological strategies in infections and toxic exposures.</li> <li>5. Develop critical thinking for pediatric and immunocompromised patient presentations.</li> </ol>	<p>This theme provides an integrated approach to understanding clinically significant <b>viral and fungal infections</b> alongside <b>toxic exposures</b>, emphasizing the interplay between laboratory diagnostics, pathology, pharmacology, and clinical management. Students begin by exploring <b>viral pathogens</b> such as HSV, Dengue, VZV, and CMV, learning to recognize their pathological features, laboratory identification methods, and clinical manifestations, including pediatric and immunocompromised presentations. Parallely, the theme addresses <b>fungal infections</b> like Candida species and opportunistic mycoses, focusing on their identification through microscopy, culture, and staining, as well as their pathological and clinical impact.</p> <p>In addition, students examine <b>toxicological cases</b>, particularly vegetable poison exposures, integrating postmortem and autopsy findings with clinical symptoms to understand patient outcomes and forensic relevance. By combining these elements, the theme fosters <b>holistic clinical reasoning</b>, encouraging learners to interpret laboratory results in the context of patient presentations, select evidence-based pharmacological therapies using P-drug principles, and anticipate complications in vulnerable populations. Overall, the theme develops a comprehensive understanding of <b>microbial and toxicological threats</b>, bridging theoretical knowledge with practical, diagnostic,</p>
	<b>Subtheme 1: Clinically Significant Viral Infections</b>	<ol style="list-style-type: none"> <li>1. Describe the pathological and clinical features of HSV, Dengue, VZV, and CMV infections.</li> <li>2. Explain laboratory diagnostic methods for viral infections (serology, PCR, viral culture).</li> <li>3. Interpret lab results in the context of clinical presentation.</li> <li>4. Discuss pediatric and immunocompromised manifestations of viral diseases.</li> <li>5. Select and justify antiviral therapy based on P-drug principles.</li> </ol>	

		6. Correlate pathological findings with disease progression.	therapeutic, and forensic applications, ensuring students can translate their learning directly into safe and effective patient care.
	<b>Subtheme 2: Fungal Infections and Toxicological Cases: Laboratory to Therapy</b>	<ol style="list-style-type: none"><li>1. Identify common fungal pathogens, including Candida species and opportunistic mycoses.</li><li>2. Describe laboratory techniques for fungal identification (microscopy, culture, staining).</li><li>3. Explain pathological manifestations of fungal infections.</li><li>4. Recognize clinical signs and management strategies for toxic exposures (vegetable poisons).</li><li>5. Correlate autopsy and postmortem findings with toxicology cases.</li><li>6. Apply P-drug principles to antifungal therapy.</li><li>7. Integrate laboratory, pathological, and clinical information for comprehensive patient management.</li></ol>	

## Specific Learning Objectives – WEEK 1

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
	<b>Structure of Bacterial cell</b>	Differentiate between structure of gram positive and gram-negative bacterial cell wall Correlate structural components of bacteria with their pathogenicity Define plasmid, transposon, mesosome, glycocalyx.	C3 C3 C1		SGD	MCQs, SEQs, OSPE, Viva
	<b>Bacterial metabolism and Growth curve</b>	Define each phase of growth cycle Differentiate between aerobic and anaerobic growth Explain fermentation of sugars Discuss iron metabolism Define each phase of growth cycle	C1 C3 C2 C2 C2		SGD	MCQs, SEQs, OSPE
	<b>Bacterial Genetics</b>	Define different types of mutations Describe bacterial components for genetic transformation Discuss high frequency recombination Define fertility plasmid and sex pilus Discuss transduction	C1 C2 C1 C2 C2		LGIS	SEQs, MCQS, OSPE
	<b>Pathogenesis of Infectious agent in Microbiology</b>	Define different terminologies Explain modes of transmission and adherence and entry in host cell Explain mechanism of action of important toxins Differentiate between exotoxin and endotoxin Explain Koch's postulates Identify different lab test Describe principle of different lab test Interpret various lab tests for different diseases	C1 C2 C2 C2 C2 C1 C2 C3		SGD	MCQs, SEQs, OSPE
<b>PHARMACOLOGY</b>						
	<b>Introduction to Antimicrobials</b>	Classify anti-bacterial drugs based on mechanism of Action, anti-microbial spectrum & type of anti-microbial activity	C1 C2 C2		LGIS	SEQs, MCQS

		Explain bacteriostatic & bactericidal activity of antibacterial drugs with examples Describe Dose-dependent & time-dependent killing based on MIC Explain post-antibiotic effect with examples Describe briefly the steps and factors affecting selection of an antimicrobial for different types of therapy Enumerate the problems associated with anti-microbial use Briefly discuss anti-microbial resistance and its mechanism	C2 C2 C2 C2			
	<b>Pencillins I</b> (Classification and Pharmacokinetic)	Enumerate groups of Cell Wall Inhibitors Classify Penicillin Describe mechanism of action of Penicillin Describe anti-bacterial spectrum of Penicillin	C1 C1 C2 C2		LGIS	SEQS, MCQS
	<b>Pencillins II</b> (Pharmacodynamics with interaction)	Enumerate uses & adverse effects of Penicillin Describe mechanisms of resistance to Penicillin	C1 C2		LGIS	SEQS, MCQS
<b>BIOCHEMISTRY</b>						
	<b>Revisit Lecture</b>	Kreb cycle, pyruvic acid cycle, bacterial metabolism	C2		LGIS	MCQS
<b>SURGERY</b>						
	<b>Microbiology of Surgical infection</b>	Enlist and common surgical pathogens -Define wound infection. -Describe decisive period and role prophylactic antibiotic in this period. -Describe sources of wound infection and risk factors of wound infection	C1 C1 C3 C2		LGIS	SEQS, MCQS, OSPE
	<b>Presentation of surgical infections</b>	Describe surgical site infection and its types. -Describe management of SSL. -Briefly Describe management of local infections like thrombophlebitis, lymphangitis, abscess. -Describe management of systemic infections SIRS, septicemia in surgical patient. -Briefly describe requirement of Surgery in patients with HIV, COVID and precautions needed.	C3 C3 C2 C3 C3		LGIS	SEQS, MCQS, OSPE
<b>MEDICINE</b>						

	<b>Introduction, basic symptoms analysis and investigations</b>	<ul style="list-style-type: none"> <li>•Discuss clinical examination of patients with infectious disease.</li> <li>•Describe presenting problems in infectious disease in relation to different symptoms</li> <li>•Discuss microbial investigations of infectious diseases.</li> </ul>	C2, A3 C2 C2, C3		LGIS	SEQS, MCQS, OSPE
	<b>Fever of unknown origin</b>	<ul style="list-style-type: none"> <li>•Define P.U.O.</li> <li>•Enumerate causes/etiology of P.U.O.</li> </ul> Describe investigations and management plan of P.U.O.	C1 C2, A3 C1, C3		LGIS	SEQS, MCQS, OSPE
<b>FAMILY MEDICINE</b>						
	<b>Ethical Consideration of infectious diseases</b>	Weigh ethical challenges in controlling outbreaks and balancing individual rights with public health measures. Analyze ethical issues in allocating resources during outbreaks, focusing on equity and access. Grasp ethical principles in infectious disease research, like consent and data privacy.	C2 C2 C2		LGIS	SEQS, MCQS

## Transdisciplinary Clinical–Reasoning Forum (TCRF-1)

### Theme 1

#### Theme: Introduction to Microbial Pathogenesis and Therapeutics

Theme	Week	Topic	Clinical Case Scenario
Theme 1	Week 1	Understanding Microbial Biology, Pathogenesis, and Therapeutic Strategies	A male presents with fever, malaise, and localized signs of infection following a minor surgical procedure.

#### “Post-surgical bacterial infection case”

##### Clinical Scenario

A 35-year-old male presents with fever, malaise, and localized signs of infection following a minor surgical procedure. Laboratory investigations reveal elevated white blood cell count and positive cultures for a bacterial pathogen. The case requires integration of microbial biology, laboratory diagnostics,

and rational antimicrobial therapy to ensure appropriate patient management and prevent resistance. Students are asked to analyze how microbial characteristics, host responses, and treatment options interact in clinical decision-making.

### **Student Task (Problem-Based Trigger)**

Students are asked to:

1. Describe the structure, metabolism, and genetics of microorganisms relevant to human disease.
2. Explain mechanisms by which microbes cause infections and the host immune response.
3. Identify laboratory methods for diagnosing bacterial infections.
4. Discuss principles of antimicrobial therapy, including drug selection, pharmacokinetics, and rational use.
5. Apply ethical principles in infectious disease management, including informed consent and public health responsibilities.

### **Students Integrate (Implicitly)**

Students implicitly integrate knowledge from:

- **Microbial biology** (structure, metabolism, genetics, growth patterns)
- **Pathogenesis and host response** (mechanisms of infection, immune evasion)
- **Clinical interpretation** (laboratory findings, culture results, growth curves)
- **Pharmacology** (antimicrobial classes, mechanism of action, pharmacokinetics, and pharmacodynamics)
- **Surgical and medical management** (infection control, antibiotic stewardship)
- **Ethics and communication** (informed consent, public health responsibilities)

### **What Makes This Harden's Integration Level 11?**

This session represents Harden Level 11 (Transdisciplinary Integration) because learning is organized around a **real patient scenario** rather than subject headings. Students integrate microbiology, pathology, pharmacology, medicine, surgery, and ethics seamlessly while making clinical decisions. Knowledge is embedded within authentic reasoning tasks, emphasizing laboratory diagnostics, therapeutic strategy, and professional responsibility, mirroring real-world clinical workflow.

### **Teaching Format**

- Small group problem-based learning with facilitator guidance
- Laboratory demonstrations and practical exercises in microbial identification
- Simulation of antimicrobial selection and case discussion
- Role-play on informed consent and patient counseling
- Competency assessment:
  - Clinical reasoning
  - Rational antimicrobial decision-making
  - Laboratory interpretation
  - Ethical and communication skills

### **Academic Justification Statement**

This theme integrates microbial biology, pathogenesis, diagnostic approaches, therapeutic strategies, and professional ethics. By embedding knowledge within patient-centered decision-making, students develop the ability to synthesize biomedical concepts, pharmacologic principles, and ethical considerations, fostering transdisciplinary clinical reasoning.

## Subject Contribution in TCRF Session 1

Subject / Discipline	Nature of Contribution	Approx. Integration Weight (%)	Rationale
Microbiology / Pathology	Bacterial structure, metabolism, genetics, lab diagnosis	25%	Core knowledge of microbial pathogenesis
Pharmacology	Antimicrobial classes, mechanism, pharmacokinetics	20%	Rational therapy and treatment planning
Medicine	Clinical presentation, systemic infection management	20%	Medical decision-making context
Surgery	Microbiology of surgical infections, wound care strategies	10%	Practical application in surgical infections
Family Medicine / Public Health	Ethical principles, informed consent, community health	15%	Professional and public health responsibilities
Biochemistry	Metabolic pathways of microorganisms (Krebs, growth curve)	10%	Mechanistic understanding of microbial metabolism

## Subject-Wise Specific Learning Objectives

Subject	Domain	Specific Learning Objectives (Students will be able to...)	Bloom's Level	Integration Role
Microbiology / Pathology	Microbial Biology & Diagnosis	Describe bacterial structure, metabolism, and growth patterns	Understand	Core discipline
		Explain bacterial genetics and mechanisms of antibiotic resistance	Understand	Mechanistic understanding
		Correlate microbial characteristics with clinical manifestations	Analyze	Clinical interpretation
Pharmacology	Therapeutics	Outline major classes of antimicrobial agents and mechanisms of action	Apply	Treatment planning
		Explain pharmacokinetics and pharmacodynamics of key antibiotics	Analyze	Rational therapy
		Apply principles of rational antibiotic use based on microbial susceptibility	Apply	Clinical decision-making
Medicine	Clinical Reasoning	Analyze basic symptoms and investigations of infectious diseases	Analyze	Medical context
Surgery	Clinical Management	Apply knowledge of microbial infections to surgical wound management	Apply	Practical application
Family Medicine / Public Health	Ethics & Communication	Discuss ethical considerations, informed consent, and public health responsibilities	Apply	Professional responsibility
Biochemistry	Mechanistic Knowledge	Describe bacterial metabolic pathways including Krebs cycle and pyruvate utilization	Understand	Mechanistic understanding

## Specific Learning Objectives – WEEK 2

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
	<b>Antimicrobial Drug Resistance and Vaccine</b>	Explain mechanism of resistance to antibiotics in bacteria Describe vaccines Discuss diseases against which vaccines are used	C1 C2 C2		LGIS	SEQS, MCQS,
	<b>Sterilization and Disinfection</b>	Define Chemical disinfectants Categorize chemical disinfectants Explain physical methods of disinfection and sterilization	C1 C2 C2		SGD	MCQs, SEQs, OSPE
	<b>Staphylococci</b>	-Explain Important properties, epidemiology -Describe transmission, pathogenesis Signs, symptoms, laboratory diagnosis and treatment of Staphylococcus aureus Staphylococcus epidermidis and Staphylococcus saprophyticus	C1 C2 C2 C2		LGIS	SEQS, MCQS, OSPE
	<b>Streptococci</b>	Enumerate different types of streptococci according to their groups. -Explain important diseases and laboratory diagnosis of $\beta$ -hemolytic streptococcus. -Explain important diseases and laboratory diagnosis of Streptococcus viridians -Discuss different properties and diseases caused by strep. Pneumonia -Discuss diseases and laboratory diagnosis of enterococci and streptococcus pneumonia	C1 C2 C2 C2		LGIS	SEQS, MCQS, OSPE
<b>PHARMACOLOGY</b>						
	<b>Cephalosporins</b>	-Classify Cephalosporins -Describe mechanism of action of Cephalosporins -Discuss anti-bacterial spectrum of different generations of Cephalosporins	C1 C2 C2 C2		LGIS	SEQS, MCQS

		-Discuss uses and adverse effect of Cephalosporins based on their spectrum				
	<b>Carbapenems and Monobactam</b>	Grasp the properties and mechanisms of action of these antibiotic classes. Understand the types of bacteria susceptible to Carbapenems and Monobactams. Recognize appropriate use cases for Carbapenems and Monobactams in treatment.	C2 C2 C2		LGIS	SEQS, MCQS
	<b>Vancomycin and cell wall synthesis inhibitors</b>	Describe mechanism of action and clinical uses of Vancomycin Enumerate adverse effects of vancomycin Explain in detail Red Man Syndrome and its management	C2 C2 C2		LGIS	MCQS, SEQS
	<b>Fluoroquinolones</b>	Classify fluoroquinolones Describe mechanism of action of Fluoroquinolones Discuss spectrum of Fluoroquinolones Discuss uses of Fluoroquinolones based upon their Spectrum	C1 C2 C2 C2		LGIS	MCQS, SEQS
	<b>Pharmacovigilance</b>					
<b>MEDICINE</b>						
	<b>Brucellosis</b>	•Recognize epidemiology of infection. •Describe clinical findings of brucellosis. •Recognize epidemiology of infection.	C1 C2, C3 C2		LGIS	SEQS, MCQS, OSPE
<b>FORENSIC MEDICINE</b>						
	<b>Inebriants (Alcohol)</b>	Classify the types of Alcohol Describe the clinical presentation of alcohol intoxication both acute and chronic	C2 C1 C2 C2 C2		LGIS	SEQS, MCQS, OSPE

		Briefly explain the clinical tests for examinations and the collection of blood, urine and vomitus and their necessary sampling . State the Medicolegal importance of alcoholic intoxication. Describe the management of acute and chronic alcohol intoxication in general.				
	<b>Agricultural Poisons (OCP)</b>	Enlist the physical properties of Organoposphours compounds. · Briefly describe the mechanism of action in humans and clinical features of Organoposphours compounds poisoning and its management. · State the Medico-legal importance of Organoposphours compounds poisoning. · Enumerate the autopsy findings of Organoposphours compounds poison Enlist the physical properties of Organoposphours compounds. ·	C1 C2 C2 C2 C3		LGIS	MCQS, OSPE
<b>SURGERY</b>						
	<b>Critical Surgical infections and their treatment</b>	describe management of gas gangrene, necrotizing fasciitis	C3		LGIS	SEQS, MCQS, OSPE
	<b>Prevention of surgical infection</b>	Understand importance of aseptic technique in surgery for prevention of surgical infection. -Understand role of pre –operative patient optimization and preparation in prevention of surgical infection. -Describe role of prophylactic antibiotics	C2 C3 C3		LGIS	SEQS, MCQS, OSPE
<b>PEADS</b>						
	<b>Neonatal Tetanus</b>	<ul style="list-style-type: none"> <li>•Define Neonatal tetanus</li> <li>•Describe clinical features</li> <li>•Discuss Differential diagnosis</li> <li>•Discuss treatment and management plan</li> <li>•Discuss Role of immunoglobulins.</li> <li>•Discuss about maternal and neonatal immunization for tetanus</li> <li>•Enlist preventive measures</li> </ul>	C1 C1 C2 C2 C2 C2 C2		LGIS	SEQS, OSPE
	<b>Diphtheria ,Pertussis, Chicken Pox</b>	Identify the causative agents and primary modes of transmission for diphtheria, pertussis, and chicken pox. Describe the key clinical features of each disease, including the pseudomembrane in diphtheria, the	C1 C2 C2 C2		LGIS	SEQS, OSPE, MCQS

		<p>paroxysmal cough in pertussis, and the characteristic rash in chicken pox.</p> <p>Explain the role of vaccination in the prevention of diphtheria and pertussis and discuss the concept of immunity following chicken pox infection.</p> <p>Outline the fundamental principles of management for each disease, including the use of antitoxin for diphtheria, antibiotics for pertussis, and primarily symptomatic care for uncomplicated chicken pox.</p>				
<b>COMMUNITY MEDICINE</b>						
	<p>Disposal of Waste</p> <p>Housing</p>	<p>Define solid waste.</p> <p>Demonstrate sources of waste.</p> <p>Explain ways of collection of waste.</p> <p>Describe methods of disposal of waste</p> <p>Describe health hazards of improper disposal.</p> <p>Describe sanitation barrier.</p> <p>Elaborate methods of excreta disposal.</p> <p>Define septic tank and its working.</p> <p>Describe its maintenance.</p> <p>Explain ways for disposal of sewage</p> <p>Describe health hazards of improper sewage treatment.</p> <p>Enlist modern ways of sewage disposal</p> <p>Describe criteria for healthful housing</p> <p>Describe the housing standards</p> <p>Explain effects of housing on health</p> <p>Define overcrowding</p> <p>Enlist indicators of housing</p>	<p>C1</p> <p>C3</p> <p>C2</p> <p>C2</p> <p>C2</p> <p>C3</p> <p>C1</p> <p>C2</p> <p>C2</p> <p>C1</p> <p>C2</p> <p>C2</p> <p>C2</p> <p>C1</p> <p>C1</p>		-LGIS	MCQ

## Transdisciplinary Clinical–Reasoning Forum (TCRF-2)

### Theme 2

#### Theme: Microbes, Medicines, and Modern Prevention

Theme	Week	Topic	Clinical Case Scenario
Theme 2	Week 2	Integrated Microbial Diagnostics, Therapeutics, and Public Health	A community outbreak scenario involves patients presenting with bacterial infections such as Brucellosis, Staphylococcal infections, and neonatal tetanus.

#### “Community bacterial infections & toxin exposure”

##### Clinical Scenario

A community outbreak scenario involves patients presenting with bacterial infections such as Brucellosis, Staphylococcal infections, and neonatal tetanus. Some patients require hospitalization and antimicrobial therapy, while others are exposed to environmental toxins like methyl alcohol and organophosphates. Students are asked to integrate microbial identification, rational antibiotic selection, preventive measures, and public health interventions to manage infections effectively and reduce morbidity.

##### Student Task (Problem-Based Trigger)

Students are asked to:

1. Describe microbial structure, growth, and pathogenesis relevant to human infections.
2. Explain antimicrobial mechanisms, resistance, and vaccination strategies.
3. Identify clinical presentations and laboratory methods for infectious disease diagnosis.
4. Apply rational antimicrobial therapy and pharmacovigilance principles.
5. Discuss preventive measures including infection control, sanitation, vaccination, and ethical responsibilities.

##### Students Integrate (Implicitly)

Students implicitly integrate knowledge from:

- **Microbial biology and pathogenesis** (morphology, growth, virulence factors)
- **Diagnostics** (microscopy, culture, susceptibility testing, lab safety)
- **Pharmacology and therapeutics** (Cephalosporins, Carbapenems, Vancomycin, Fluoroquinolones, prescription writing, pharmacovigilance)
- **Clinical medicine** (management of infections across medicine, surgery, paediatrics)
- **Forensic medicine & toxicology** (alcohol, methyl alcohol, OPC exposure)
- **Community medicine & public health** (waste disposal, infection prevention, healthful housing)
- **Ethics and communication** (public health responsibilities, informed consent)

#### What Makes This Harden’s Integration Level 11?

This session represents Harden Level 11 (Transdisciplinary Integration) because students are guided by **authentic community and clinical cases** rather than isolated subjects. Learning integrates microbiology, pharmacology, pathology, medicine, surgery, paediatrics, forensic medicine, and public health. Students engage in real-world clinical reasoning that links microbial diagnostics, rational drug therapy, preventive strategies, and public health ethics. Knowledge is applied contextually, mirroring professional decision-making in diverse healthcare settings.

**Teaching Format**

- Small group case-based discussions and lab practicals
- Pharmacology workshops on antimicrobial classes, mechanisms, and prescription writing
- Pathology practicals: bacterial morphology, lab diagnosis, sterilization, disinfection
- Forensic toxicology demonstrations: alcohol and OPC exposure
- Community medicine exercises: waste disposal, infection control, and healthful housing
- Competency assessment:
  - Clinical reasoning
  - Rational antimicrobial use
  - Laboratory interpretation
  - Preventive and public health interventions
  - Ethical decision-making

**Academic Justification Statement**

This theme emphasizes integrated learning of microbial pathogenesis, antimicrobial therapy, toxicology, and public health. Students develop the ability to synthesize biomedical knowledge, clinical management, and preventive strategies in a transdisciplinary framework, fostering practical problem-solving and professional responsibility in infectious disease control.

**Subject Contribution in TCRF Session 2**

Subject / Discipline	Nature of Contribution	Approx. Integration Weight (%)	Rationale
Pathology / Microbiology	Microbial structure, growth, virulence, lab diagnostics	25%	Core understanding of microbial pathogenesis
Pharmacology	Antimicrobial classes, pharmacokinetics, rational use	20%	Safe and effective therapy planning
Medicine	Clinical presentations, management of infections	15%	Medical decision-making context
Surgery	Prevention of surgical infections, infection control	10%	Practical application in operative settings
Paediatrics	Management of neonatal infections (e.g., tetanus, DTP)	10%	Pediatric infectious disease management
Forensic Medicine	Toxic exposure evaluation (alcohol, methyl alcohol, OPC)	10%	Integration of toxicology and clinical reasoning

### Subject-Wise Specific Learning Objectives

Subject	Domain	Specific Learning Objectives (Students will be able to...)	Bloom's Level	Integration Role
Pathology / Microbiology	Microbial Biology & Diagnostics	Describe bacterial morphology, growth patterns, and pathogenesis	Understand	Core discipline
		Explain microbial resistance mechanisms and susceptibility testing	Understand	Mechanistic understanding
		Apply lab techniques for diagnosis of infectious agents	Apply	Clinical interpretation
Pharmacology	Therapeutics	Outline major classes of antibiotics and mechanisms of action	Apply	Treatment planning
		Apply rational drug use and pharmacovigilance principles	Apply	Clinical decision-making
Medicine	Clinical Reasoning	Identify clinical presentations and investigations for infectious diseases	Analyze	Medical context
Surgery	Clinical Management	Apply infection prevention strategies in surgical patients	Apply	Practical application
Paediatrics	Pediatric Management	Manage neonatal infections including tetanus, DTP, and viral illnesses	Apply	Pediatric context
Forensic Medicine	Toxicology	Recognize effects of toxic exposures (alcohol, methyl alcohol, OPC)	Analyze	Integrative reasoning
Community Medicine / Public Health	Prevention & Ethics	Discuss sanitation, vaccination, infection control, and ethical considerations	Create	Public health responsibility

### Specific Learning Objectives – WEEK 3

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
	Gram Negative Cocci	Enumerate different types of gram-negative cocci -Discuss different types of gram-negative cocci in detail along with their laboratory diagnosis -	C1 C2		LGIS	SEQS, MCQS, OSPE
	Gram Positive Rods	Describe unique traits of Gram-positive rods and how they differ from other bacteria. Identify key genera of Gram-positive rods. Understand the role of Gram-positive rods in health and disease.	C1 C2 C2		SGD	SEQS, MCQS, OSPE
	Introduction to Enterobacteria, E coli	Describe Important properties of Enterobacteria -Describe transmission, pathogenesis, signs and symptoms, laboratory diagnosis of Enterobacteria Describe different strains of E. coli --Explain laboratory diagnosis and treatment of E. coli infection	C2 C2 C1 C2		LGIS	SEQS, MCQS, OSPE
	Salmonella classification, pathogenicity, properties and lab diagnostics	Discuss Important properties & epidemiology - Explain transmission, pathogenesis, signs and symptoms -Identify laboratory diagnosis and treatment of Salmonella Discuss classification of salmonella -Explain important properties and pathogenesis of Salmonella -Discuss chronological order of diagnostic tests for typhoid fever	C2 C2 C2 C3 C2 C2		LGIS	SEQS, MCQS, OSPE

	Klebsiella, shigella, vibrio cholera	Describe Important properties, epidemiology of vibrio cholerae and shigella -Describe transmission, pathogenesis, signs and symptoms, laboratory diagnosis and treatment of Shigella and Vibrio Cholerae -Enumerate different types of vibriion -Discuss pathogenesis of cholera and shigellosis. -Identify diagnostic tests available for vibrio cholera and its treatment -Discuss interpretation of TSI Describe Important properties, epidemiology of vibrio cholerae and shigella	C2 C2 C1 C2 C3 C2 C2		SGD	MCQs, SEQs, OSPE
<b>PHARMACOLOGY</b>						
	Sulphonamides & Trimethoprim	Describe the mechanism of action of Co-Trimoxazole	C2		LGIS	MCQS, SEQs
	Tetracyclines	Enumerate groups of Protein synthesis inhibitors -Classify tetracyclines -Describe the mechanism of action of Tetracyclines -Describe the anti-bacterial spectrum of Tetracyclines -Enumerate uses and adverse effects of Tetracyclines	C2 C2 C3 C2 C1		LGIS	MCQS, SEQs
	Macrolides	Enumerate Macrolides Discuss mechanism of action of Macrolides Discuss spectrum of antibacterial activity of Macrolides Discuss adverse effects of macrolides	C1 C2 C2 C2		LGIS	MCQS, SEQs
	Meningitis	Grasp the definition, causes, and types of meningitis. Identify common symptoms and understand diagnostic methods for meningitis.	C2 C2 C2		CBL	MCQS, SEQs, OSPE

		Learn treatment options and effective preventive measures for meningitis.				
	VRSA endocarditis	Understand the challenges of VRSA (Vancomycin-Resistant Staphylococcus Aureus) in endocarditis treatment. Explore alternative antibiotic regimens for VRSA endocarditis. Analyze the pharmacological properties and potential side effects of VRSA endocarditis treatments.	C2 C2 C2		CBL	MCQS, SEQS, OSPE
<b>FORENSIC MEDICINE</b>						
	Inorganic Irritant Metallic Poisons (Arsenic)	Classify the types of Inorganic Irritants (Arsenic). Describe mechanism of action of inorganic irritants and clinical features of a poisoning with Arsenic. Mention the fatal dose, management, medico-legal importance of each type of inorganic poisoning. Briefly explain the autopsy findings of a victim of inorganic metallic poisoning.	C1 C2 C2 C2		LGIS	SEQS, MCQS, VIVA
<b>SURGERY</b>						
	<b>Antimicrobial treatment in surgical infections</b>	Understand principles of antimicrobial treatment in surgical infections. -Describe rational empirical antibiotics use according to flora.	C2 C3		LGIS	SEQS, MCQS, OSPE
<b>FAMILY MEDICINE</b>						
	Sexually transmitted diseases	classify STDs Describe the management approach to a patient with STD in family practice Identify patients at risk and offer them screening Describe prevention of STDs	C1 C2 C2 C2		LGIS	SEQS, MCQS
	An approach to patient with fever	Identify causes and conduct a targeted patient examination. Understand proper treatment plans for different fevers. Recognize when to refer patients with fever to specialists.	C2 C2 C2		LGIS	SEQS, MCQS
<b>GYNAE/OBS</b>						

	Infection In Pregnancy	Classify infections in pregnancy Enlist the organism of infection Identify lab diagnosis and treatment	C2 C2 C2		LGIS	SEQS, OSPE
<b>PEADS</b>						
	Enteric Fever, Acute Diarrhea	Differentiate the common causative agents and primary routes of transmission Compare and contrast the key clinical features and potential complications Outline the essential diagnostic strategies Summarize the fundamental principles of management	C1 C2 C2 C2		LGIS	SEQS, OSPE, MCQS

## Transdisciplinary Clinical–Reasoning Forum (TCRF-3)

### Theme 3

#### Theme: Pathological Foundations of Infectious and Toxicological Disorders

Theme	Week	Topic	Clinical Case Scenario
Theme 3	Week 3	Clinical and Laboratory Management of Infectious and Toxicological Disorders	Pediatric, adult, and maternal patients with bacterial infections and toxic exposures

#### “Bacterial infections and toxic exposures management”

##### Clinical Scenario

A 7-year-old child and a 28-year-old pregnant woman present to the hospital with fever, gastrointestinal symptoms, and signs of systemic infection. Laboratory investigations reveal Gram-positive and Gram-negative bacterial growth in cultures, with species including *Salmonella*, *Klebsiella*, *Shigella*, and *Vibrio*. A separate adult patient is admitted following accidental ingestion of wheat pill, showing vomiting, abdominal pain, and signs of metallic poisoning. The clinical team must identify microbial pathogens, interpret laboratory findings, correlate with clinical presentation, and institute appropriate pharmacological and supportive interventions, while managing toxicological emergencies and considering public health implications.

##### Student Task (Problem-Based Trigger)

Students are asked to:

1. Identify Gram-positive and Gram-negative bacteria using staining and culture techniques.
2. Describe morphological and lab characteristics of Enterobacteriaceae, *Klebsiella*, *Shigella*, and *Vibrio*.

3. Interpret culture media and laboratory findings in infectious cases.
4. Correlate pathological findings with clinical presentations in enteric fever, diarrhea, pediatric infections, and infections in pregnancy.
5. Analyze toxic exposure cases including wheat pill and metallic/arsenic poisoning.
6. Prescribe appropriate pharmacologic therapy based on microbial and pathological findings.
7. Discuss interdisciplinary management including infectious disease, pediatrics, gynecology, and forensic medicine considerations.

#### **Students Integrate (Implicitly)**

- Microbial morphology and Gram staining interpretation
- Laboratory diagnostics and culture techniques
- Pathophysiology of bacterial infections and toxicological injury
- Clinical reasoning for infectious and pediatric cases
- Pharmacologic principles and rational drug selection
- Forensic and surgical management of toxic exposures
- Maternal-fetal considerations in infections during pregnancy
- Public health perspective on antimicrobial stewardship and poisoning prevention

#### **What Makes This Harden's Integration Level 11?**

- Knowledge from multiple disciplines is embedded within real clinical reasoning.
- Laboratory, pharmacologic, forensic, and clinical management concepts are integrated without subject headings.
- Patient problems organize learning rather than traditional academic divisions.
- Learning mirrors authentic clinical decision-making for infectious and toxicological emergencies.

#### **Teaching Format**

- Small group case-based learning
- Laboratory simulations for microbial identification and culture interpretation
- Toxicology emergency simulations
- Clinical reasoning discussions for pediatric, adult, and maternal cases
- Competency assessment based on:
  - Diagnostic reasoning
  - Therapeutic decision-making
  - Interdisciplinary management
  - Communication and counseling

#### **Academic Justification Statement**

This theme represents Harden Level 11 transdisciplinary integration, as students learn to connect microbial identification, pathological mechanisms, laboratory diagnostics, pharmacology, and clinical management in a seamless framework. The approach bridges bench-to-bedside understanding, emphasizing the relevance of lab findings to patient care, rational drug use, maternal and pediatric considerations, and toxicological emergencies, while fostering interdisciplinary decision-making and public health awareness.

### Subject Contribution in TCRF Session 3

Subject / Discipline	Nature of Contribution	Approx. Integration Weight (%)	Rationale
Pathology	Microbial morphology, Gram staining, culture interpretation	25%	Core diagnostic discipline
Medicine / Family Medicine	Clinical correlation of infectious diseases, pediatric & adult infections	20%	Applies lab findings to patient care
Pharmacology	Rational antimicrobial and supportive therapy	20%	Guides therapeutic decisions
Forensic Medicine / Surgery	Toxicology evaluation and management	15%	Provides insights on poisoning cases
Obstetrics / Gynecology	Infection management during pregnancy	10%	Maternal-fetal relevance
Community Medicine	Public health, antimicrobial stewardship, prevention	5%	Population-level perspective
Ethics & Communication	Counseling patients/families on infections and toxic exposures	5%	Shared decision-making and ethical care

### Subject-Wise Specific Learning Objectives

Subject	Domain	Specific Learning Objectives (Students will be able to...)	Bloom's Level	Integration Role
Pathology	Laboratory & Diagnostic	Identify Gram-positive and Gram-negative bacteria using staining and culture techniques Describe morphology and lab characteristics of Enterobacteriaceae, Klebsiella, Shigella, Vibrio Interpret culture media results	Understand / Apply / Analyze	Core diagnostic discipline
Medicine / Family Medicine	Clinical Reasoning	Correlate pathological findings with enteric fever, diarrhea, infections in pregnancy Analyze pediatric and adult infectious cases using lab and clinical data	Analyze	Clinical application
Pharmacology	Therapeutics	Prescribe appropriate drugs based on microbial and pathological findings Discuss antimicrobial selection principles	Apply / Analyze	Rational therapy
Forensic Medicine / Surgery	Toxicology	Recognize pathological changes associated with wheat pill and metallic/arsenic poisoning Manage toxic exposures clinically	Understand / Apply	Emergency and forensic perspective

Obstetrics / Gynecology	Maternal Health	Identify infections during pregnancy and correlate with lab findings Plan interventions considering maternal-fetal safety	Analyze	Maternal-fetal relevance
Community Medicine	Public Health	Identify population-level determinants of infectious disease and poisoning Propose prevention strategies	Analyze / Create	Prevention & public health
Ethics & Communication	Professional Skills	Counsel patients and families regarding infectious and toxicological risks and interventions	Apply	Shared decision-making

### Specific Learning Objectives – WEEK 4

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
	Gram Negative Rods Related to Respiratory Tract	Describe Important properties & epidemiology of Gram-Negative rods related to RTI.C2 -Discuss transmission, pathogenesis, signs and symptoms, laboratory diagnosis of Haemophilus C2. -Discuss important properties C2 -Discuss pathogenesis, laboratory diagnosis of bacteria of respiratory tract.C2 Explain pathogenesis of Bordetella, - C2 Discuss legionnaire's disease and important properties of organism	C2  C2  C2 C2  C2 C2		LGIS	SEQS, MCQS, OSPE
	Rickettsiae, Chlamydia	Enlist types of Rickettsia, Chlamydia Describe Pathogenesis, Clinical features, treatment of diseases caused by Rickettsia, Chlamydia	C2 C2		LGIS	VIVA, MCQS, OSPE
	Helicobacter and Campylobacter	-Discuss related diseases of Helicobacter and Campylobacter C2, Discuss pathogenesis and laboratory diagnosis of Campylobacter and Helicobacter C2,	C2 C2		SGD	MCQs, SEQs, OSPE

	Gram Negative Rod Related Zoonotic Disease	Discuss pathogenesis and laboratory diagnosis of brucella -Discuss important properties -Discuss pathogenesis and laboratory diagnosis of Yersinia pestis -Explain pathogenesis and laboratory diagnosis of infections caused by Francisella and Pasteurella Discuss pathogenesis and laboratory diagnosis of brucella	C2 C2 C2 C2 C2		CBL	MCQS, SEQS, OSPE
	Spirochetes	Explain different stages of syphilis, Describe different serological techniques used for diagnosis of syphilis, Discuss treatment and prevention of syphilis, Explain Lyme's Disease, Explain transmission of leptospira	C2 C2 C2 C2 C2		CBL	MCQS, SEQS, OSPE
	Polio and Rabies virus	Explain the important properties •Describe Replicative cycle •Explain the transmission and pathogenesis of the diseases caused by these viruses •Explain the interaction of pathogenesis of viruses & immunity of individuals •Explain clinical findings and its laboratory identification •Describe the treatment & Prevention	C2 C2 C2 C2 C2 C2		CBL	MCQS, SEQS, OSPE
<b>PHARMACOLOGY</b>						
	Clindamycin and other Protein Synthesis Inhibitors	Describe mechanism of action of clindamycin and chloramphenicol Discuss antibacterial activity of clindamycin and chloramphenicol Discuss adverse effects of both agents	C2 C2 C2		LGIS	MCQS, SEQS
	Aminoglycosides	Classify aminoglycosides Examine Pharmacokinetics of Aminoglycosides --Describe spectrum of Aminoglycosides -Describe Clinical uses of Aminoglycosides -Describe adverse effects and contraindication Aminoglycosides	C2 C2 C2 C2 C2		LGIS	MCQS, SEQS
<b>FORENSIC MEDICINE</b>						

	Inorganic Irritant Metallic Poisons (Lead)	<ul style="list-style-type: none"> <li>•Classify the types of Inorganic Irritants (Lead).</li> <li>•Describe mechanism of action of inorganic irritants and clinical features of a poisoning with lead.</li> <li>•Mention the fatal dose, management, medicolegal importance of each type of inorganic poisoning.</li> <li>•Briefly explain the autopsy findings of a victim of inorganic metallic poisoning</li> </ul>	C1 C2 C2 C2		LGIS	SEQS, MCQS, OSPE
	Non-Metallic Poisons (Phosphorus and Iodine)	Classify the types of Inorganic non-metallic Irritants (Phosphorus & Iodine) · Mention the fatal dose, management, medicolegal importance of each type of inorganic poisoning. Describe mechanism of action of inorganic irritants and clinical features of a poisoning with (Phosphorus & Iodine) ·	C1 C2 C2		LGIS	SEQS, MCQS, VIVA
<b>MEDICINE</b>						
	Polio, Rabies, Virus	<ul style="list-style-type: none"> <li>•Recall epidemiology of infection.</li> <li>•Describe clinical findings of infections.</li> <li>•Describe investigations, differential diagnosis, complications and management plan for infections.</li> <li>•Recognize preventive aspects of infection.</li> </ul>	C1, A3 C2, A3 C2, A3 C2, A3		LGIS	SEQS, MCQS, OSPE
<b>MEDICAL ETHICS</b>						
	Medical Errors	Understand Medical Errors <ul style="list-style-type: none"> <li>• Explain the background of medical errors</li> <li>• Elaborate why medicine susceptible to error</li> <li>• Delineate the reasons of reluctance to report</li> <li>• Classify the medical errors</li> </ul>	C2 C2 C2 C2 C2		LGIS	MCQS
	Medical Errors	Perform the pharmacovigilance in clinical setting with special focus on performing pharmacovigilance and filling following forms <ol style="list-style-type: none"> <li>Error reporting form</li> <li>Error analysis form</li> <li>WHO guidelines for surgical procedure safety</li> <li>Guidelines for prevention of medication error</li> <li>Guidelines for prevention of diagnostic error</li> </ol>	C2		CBL	MCQS

COMMUNITY MEDICINE						
	Meteorological Environment Light ,Noise and radiation	Describe heat stress along with its indices Summarize the effects of heat stress & cold stress along with its prevention  Discuss the elements of meteorology. Demonstrate the acute mountain sickness. Explain high altitude pulmonary edema. Describe the Caisson disease. Demonstrate the concept of natural &artificial lighting Explain the effects of noise exposure Describe approaches for the control of noise pollution Explain sources of noise.	C2 C2  C2 C2 C2 C2 C2 C2 C2		LGIS	MCQ
BEHAVIOURAL SCIENCE						
	Obsessive Compulsive Disorder	The student should be able to <ul style="list-style-type: none"> <li>Define OCD and recognize its hallmark symptoms, including obsessions (intrusive thoughts) and compulsions (repetitive behaviors).</li> <li>Understand the pathophysiology and risk factors, including genetic and neurobiological contributions.</li> <li>Outline the treatment options and prescribe medication</li> </ul>	C3		LGIS	MCQS
	Post Traumatic Stress Disorder	The student should be able to <ul style="list-style-type: none"> <li>Define PTSD and identify its core features, including re-experiencing, avoidance, and hyperarousal following a traumatic event.</li> <li>Understand the risk factors and neurobiological underpinnings, such as heightened stress response and trauma exposure.</li> <li>Outline the basic management plan</li> </ul>	C3		LGIS	MCQS

## Transdisciplinary Clinical–Reasoning Forum (TCRF-4)

### Theme 4

#### Theme: Bridging Microbes, Toxins, and Holistic Patient Care

Theme	Week	Topic	Clinical Case Scenario
Theme 4	4	Integrative Clinical and Laboratory Management of Infectious, Toxicological, and Behavioral Disorders	A 10-year-old child and a 32-year-old adult present with fever, gastrointestinal symptoms, and malaise.

#### “Integrative management of infections, toxic exposures, and psychosocial challenges”

##### Clinical Scenario

A 10-year-old child and a 32-year-old adult present with fever, gastrointestinal symptoms, and malaise. Laboratory investigations reveal Gram-negative rods in stool cultures (*H. pylori*, *Campylobacter*), spirochetes in blood smear, and viral isolates including poliomyelitis virus and rabies virus. The adult patient reports accidental ingestion of metallic irritants (mercury, copper, zinc), showing vomiting, abdominal pain, and mild neurological signs. Behavioral assessment identifies obsessive-compulsive behaviors and psycho-trauma responses. The clinical team must identify microbial pathogens, interpret lab findings, analyze toxicological and behavioral presentations, and develop pharmacologic, forensic, psychosocial, and ethical management plans.

##### Student Task (Problem-Based Trigger)

Students are asked to:

1. Identify Gram-negative rods, spirochetes, and viral pathogens using staining and culture techniques.
2. Describe morphology, virulence, and lab characteristics of *H. pylori*, *Campylobacter*, *Rickettsia*, *Chlamydia*, spirochetes, poliomyelitis, and rabies virus.
3. Perform Gram and Zn staining and interpret results.
4. Analyze toxicological cases involving metallic (Hg, Cu, Zn, Pb) and non-metallic (phosphorus) poisons.
5. Correlate lab and clinical findings to diagnose infections, poisonings, and behavioral disorders.
6. Prescribe rational antimicrobial therapy and supportive management.
7. Integrate psychosocial, ethical, and environmental considerations into patient care.
8. Communicate findings effectively to patients and families for holistic care.

##### Students Integrate (Implicitly)

- Microbial morphology, Gram staining, and Zn staining interpretation
- Laboratory diagnostics for bacterial, viral, and spirochetal pathogens
- Pathophysiology of infections and toxicological injury
- Clinical reasoning for pediatric and adult cases
- Pharmacologic principles, rational drug selection, and antimicrobial stewardship
- Forensic and ethical implications of toxic exposures

- Behavioral sciences and psycho-trauma management
- Environmental and public health determinants of health

**What Makes This Harden’s Integration Level 11?**

- Knowledge from microbiology, pathology, pharmacology, toxicology, behavioral sciences, ethics, and community health is embedded within real clinical reasoning.
- Laboratory, pharmacologic, forensic, behavioral, and ethical concepts are integrated seamlessly without subject headings.
- Patient problems organize learning rather than traditional academic divisions.
- Learning mirrors authentic clinical decision-making for infectious, toxicological, and psychosocial emergencies.
- Students develop holistic clinical reasoning, considering patient, community, and public health perspectives concurrently.

**Teaching Format**

- Small group case-based learning
- Laboratory simulations for microbial and toxicology diagnostics
- Behavioral and ethical scenario discussions
- Clinical reasoning exercises for pediatric and adult patients
- Competency assessment based on:
  - Diagnostic reasoning
  - Therapeutic and supportive decision-making
  - Interdisciplinary integration
  - Ethical, psychosocial, and public health considerations
  - Communication and counseling

**Academic Justification Statement**

This theme represents Harden Level 11 transdisciplinary integration by connecting microbiology, pathology, pharmacology, toxicology, behavioral sciences, ethics, and community medicine into a cohesive framework. Students learn to interpret lab findings (Gram staining, Zn staining, cultures) in bacterial, viral, and spirochetal infections, while recognizing toxicological patterns of metallic and non-metallic irritants. They apply pharmacologic knowledge for rational drug therapy and antimicrobial stewardship. Behavioral and psychosocial assessments (OCD, PTSD, psycho-trauma) are incorporated alongside ethical principles, fostering reflection on patient safety and medical errors. Environmental and public health factors broaden the scope, linking individual care to community well-being. Through integrated case-based learning, students develop holistic clinical reasoning, emphasizing interdisciplinary decision-making, preventive strategies, and comprehensive patient care.

**Subject Contribution to TCRF Session 4**

Subject / Discipline	Nature of Contribution	Approx. Integration Weight (%)	Rationale
Pathology	Microbial morphology, staining, culture interpretation	25%	Core diagnostic discipline
Medicine / Family Medicine	Clinical correlation of infectious diseases and behavioral disorders	20%	Applies lab findings to patient care
Pharmacology	Rational antimicrobial and supportive therapy	20%	Guides therapeutic decisions

Forensic Medicine / Surgery	Toxicology evaluation and management	15%	Provides insights on poisonings
Behavioral Sciences	Assessment and management of OCD, PTSD, psycho-trauma	10%	Patient mental health and psychosocial relevance
Community Medicine	Public health, environmental determinants	5%	Population-level perspective
Ethics & Communication	Counseling patients/families on infections, toxic exposures, and behavioral care	5%	Shared decision-making and ethical care

### Subject-Wise Specific Learning Objectives

Subject	Domain	Specific Learning Objectives (Students will be able to...)	Bloom's Level	Integration Role
Pathology	Laboratory & Diagnostic	Identify Gram-negative rods, spirochetes, and viral pathogens using staining and culture techniques. Describe morphology, virulence, and lab characteristics of <i>H. pylori</i> , <i>Campylobacter</i> , <i>Rickettsia</i> , Chlamydia, poliomyelitis, and rabies virus. Perform Gram and Zn staining and interpret results.	Understand / Apply / Analyze	Core diagnostic discipline
Medicine / Family Medicine	Clinical Reasoning	Correlate lab findings with clinical presentations of atypical pneumonia, enteric fever, poliomyelitis, rabies, and zoonotic infections. Analyze pediatric and adult infectious and behavioral cases.	Analyze	Clinical application
Pharmacology	Therapeutics	Prescribe rational antimicrobial therapy based on lab and clinical data. Discuss principles of antimicrobial stewardship.	Apply / Analyze	Rational therapy
Forensic Medicine / Surgery	Toxicology	Recognize clinical signs and lab findings of metallic (Hg, Cu, Zn, Pb) and non-metallic (phosphorus) poisonings. Manage toxic exposures safely.	Understand / Apply	Emergency and forensic perspective
Behavioral Sciences	Mental Health	Describe behavioral disorders (OCD, PTSD) and psycho-trauma. Plan interventions integrating psychological and clinical considerations.	Analyze / Apply	Psychosocial relevance
Community Medicine	Public Health	Analyze environmental and meteorological factors affecting health. Propose preventive measures and community safety strategies.	Analyze / Create	Public health & prevention
Ethics & Communication	Professional Skills	Identify medical errors and ethical challenges in patient care. Counsel patients and families on infectious, toxicological, and behavioral risks.	Apply / Evaluate	Shared decision-making

## Specific Learning Objectives – WEEK 5

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
	<b>Measles, Mumps, Rubella</b>	Explain the important properties •Describe Replicative cycle •Explain the transmission and pathogenesis of the diseases caused by these viruses •Explain the interaction of pathogenesis of viruses & immunity of individuals •Explain clinical findings and its laboratory identification •Describe the treatment & Prevention	C2 C2 C2 C2 C2		LGIS	SEQS, MCQS, OSPE
	<b>Diarrheal viruses</b>	Explain the important properties •Describe Replicative cycle •Explain the transmission and pathogenesis of the diseases caused by these viruses •Explain the interaction of pathogenesis of viruses & immunity of individuals •Explain clinical findings and its laboratory identification •Describe the treatment & Prevention Explain the important properties	C2 C2 C2 C2 C2 C2 C1		CBL	MCQS, SEQS, OSPE
	<b>Systemic Mycosis and Antifungal</b>	Identify the morphology of fungi •Describe the important features of systemic fungal diseases •Describe laboratory diagnosis of systemic fungi Classify antifungal Discuss their mechanism of action	C1 C1 C1 C1 C2		LGIS	SEQS, MCQS, OSPE
	<b>Herpes Virus and HSV</b>	Explain the important properties of Herpes virus •Describe Replicative cycle •Explain the transmission and pathogenesis of the diseases caused by these viruses •Explain the interaction of pathogenesis of viruses with immunity of individuals	C2 C2 C2 C2		CBL	MCQS, SEQS, OSPE

		<ul style="list-style-type: none"> <li>• Explain clinical findings and its laboratory identification</li> <li>• Describe the treatment &amp; Prevention</li> </ul>	C2 C2			
	<b>HIV/ AIDS Diseases</b>	Explain the important properties <ul style="list-style-type: none"> <li>• Describe Replicative cycle</li> <li>• Explain the transmission and pathogenesis of the diseases caused by these viruses</li> <li>• Explain the interaction of pathogenesis of viruses &amp; immunity of individuals</li> <li>• Explain clinical findings and its laboratory identification</li> <li>• Describe the treatment &amp; Prevention</li> </ul>	C2 C2 C2 C2 C2 C2		LGIS	SEQS, MCQS, OSPE, VIVA
	<b>Cutaneous and Subcutaneous mycosis</b>	<ul style="list-style-type: none"> <li>• identify of most common fungal pathogens associated with cutaneous and sub cutaneous mycoses</li> <li>• Compare the major characteristics of specific fungal diseases affecting the skin</li> </ul>	C1 C2		CBL	MCQS, SEQs, OSPE
<b>PHARMACOLOGY</b>						
	Antiviral Agents I	Classify anti-viral drugs based on the viral disease Classify anti-viral drugs based on mechanism of action of drugs	C1 C2		LGIS	MCQS, SEQs
	Antiviral Agents II	-Outline the salient pharmacokinetic & pharmacodynamic features of antiviral drugs used to treat HSV, VZV, CMV and influenza	C2		LGIS	MCQS, SEQs
	Antiviral Agents III	Define HAART Describe the mechanism of action and adverse effects of major drug groups used in AIDS	C2		LGIS	MCQS, SEQs
	Antifungal Agents I	Enumerate various antifungal agents -Describe mechanism of action and antimicrobial spectrum of amphotericin -Discuss pharmacokinetics and unwanted effects of Amphotiricin B	C1 C2 C2		LGIS	MCQS, SEQs
	Antifungal Agents II	Describe mechanism of action of Azoles, Echinocandins and other antifungal drugs <ul style="list-style-type: none"> <li>• Discuss clinical uses and adverse effects of various antifungal drugs C2</li> </ul>	C2 C2		LGIS	MCQS, SEQs

	Shingles	<p>Understand the link between shingles reactivation and the medications used to treat it.</p> <p>Identify antiviral medications used for shingles and their mechanisms of action.</p> <p>Learn about pharmacological approaches to <u>managing pain associated with shingles.</u></p>	<p>C2</p> <p>C3</p> <p>C2</p>		CBL	MCQS, SEQS, OSPE
	Pseudomembranous colitis	<p>Explain how antibiotics allow <i>C. diff.</i> to cause pseudomembrane colitis.</p> <p>Explain the pathology of <i>C. diff.</i> colitis with fibrin casts and volcano lesions.</p> <p>Explain the symptoms of <i>C. diff.</i> colitis: foul diarrhea, cramps, fever, dehydration.</p>	<p>C2</p> <p>C2</p> <p>C3</p>		CBL	MCQS, SEQS, OSPE
<b>FORENSIC MEDICINE</b>						
	<p><b>Vegetable Poisons</b></p> <p><b>(castor, croton, capsicum, ergot, Arbus)</b></p>	<p>Enlist physical properties of <b>castor, croton, capsicum, ergot, Arbus</b></p> <p>Briefly explain their mechanisms of action in humans</p> <p>Describe clinical features of organic irritant poisoning and its management</p> <p>State the medicolegal importance of organic irritant poisoning</p> <p>Briefly explain the autopsy findings of organic irritant poisoning</p>	<p>C1</p> <p>C2</p> <p>C2</p> <p>C2</p> <p>C2</p>		CBL	MCQS, SEQS
	<p><b>Inebriants</b></p> <p>Methyl Alcohol Poisoning</p>	<p>Explain methanol's toxic cascade, Alcohol dehydrogenase, a choice ill-made.</p> <p>Formaldehyde's rise, a blinding threat, Formic acid's acidosis, we won't forget.</p> <p>Explain the ocular pathway's harm, Retinal ganglion cells sound the alarm. Optic disc hyperemia's early clue, Permanent blindness, a vision askew.</p> <p>Explain the symptoms, the patient's plight, Abdominal pain, a darkened sight. Breath with formaldehyde's sharp sting, CNS depression, life's bell will not ring.</p> <p>Explain the forensic findings we seek, Gastric contents, the toxic leak. Vitreous humor analysis, time's decree, Cause of death established, for all to see.</p>	<p>C1</p> <p>C2</p> <p>C2</p> <p>C1</p>		CBL	MCQS, VIVA
	<b>Insecticides</b>	<p>Explain phosphine's cellular attack, Cytochrome oxidase, there's no turning back.</p>	<p>C2</p>		CBL	MCQS, VIVA

	Wheat Pill Poisoning	Electron transport chain comes to a stall, Anaerobic respiration enthralls. Explain the widespread organ distress, Cardiogenic shock, a fatal caress. Pulmonary edema fills the lung's space, Hemorrhages widespread, leave not a trace. Explain the rapid onset of woe, Vomiting, convulsions, the body's throw. Garlic-like odor, a telltale sign, Death often swift, a tragic design. Explain the scene investigation's key, Aluminum phosphide tablets, for us to see. Stomach wash analysis, the poison's hold, Suicide or accident, the story unfolds.	C2 C2 C1			
<b>MEDICINE</b>						
	<b>HIV and Immunodeficiency</b>	Describe natural history and classification of HIV. Describe clinical examination of patient with HIV infection. Discuss presenting problems in HIV infection	C2, A3 C2, A3 C3, A3		LGIS	SEQS, MCQS, OSPE
<b>PEADS</b>						
	<b>Measles, Mumps, Rubella</b>	<ul style="list-style-type: none"> <li>•Define the disease</li> <li>•Describe clinical features</li> <li>•Discuss Differential diagnosis</li> <li>•Identify complications</li> <li>•Manage disease and its complications</li> <li>•Discuss immunization against measles/Mumps/Rubella</li> <li>•Enlist preventive measures</li> </ul>	C1 C1 C2 C2 C2 C3 C2		LGIS	SEQS, OSPE, MCQS

## Transdisciplinary Clinical–Reasoning Forum (TCRF-5)

### Theme 5

#### Theme: Viral and Fungal Infections: Integrated Diagnostics, Therapy, and Toxicology

Theme	Week	Topic	Clinical Case Scenario
Theme 5	Week 5	Comprehensive Management of Co-Infection and Toxic Exposure	A male presents to the emergency unit with high-grade fever, generalized maculopapular rash, painful oral ulcers, and multiple necrotic skin lesions on forearms for 4 days.

#### “Fever, Rash, Skin Lesions, Toxic Exposure”

##### Clinical Scenario

A 30-year-old male presents to the emergency unit with high-grade fever, generalized maculopapular rash, painful oral ulcers, and multiple necrotic skin lesions on forearms for 4 days. History reveals recent hiking in a rural area with potential exposure to contaminated water and wild plants. He reports accidental ingestion of a small amount of castor seeds while foraging.

On examination:

- Temp: 39.5°C, BP: 100/60 mmHg, HR: 110 bpm
- Oral mucosal ulcers, necrotic skin patches with mild surrounding erythema
- Mild hepatomegaly, no jaundice
- Neurologically intact, but mild lethargy

Investigations reveal:

- CBC: Leukopenia (3,200/mm<sup>3</sup>), thrombocytopenia (95,000/mm<sup>3</sup>)
- LFTs: Mildly elevated AST/ALT
- Viral PCR: Positive for Herpes simplex virus (HSV-1)
- Fungal cultures: *Candida albicans* isolated from skin lesions
- Urine & serum: Ricin detected (castor seed ingestion)

The clinical team coordinates virology diagnostics, fungal identification, pharmacologic therapy, and toxicology assessment to optimize patient care.

#### Student Task (Problem-Based Trigger)

Students are asked to:

1. Identify viral and fungal pathogens and interpret their clinical relevance.
2. Correlate lab results (PCR, ELISA, cultures, biochemical tests) with symptoms.
3. Formulate an integrated treatment plan including **antivirals, antifungals, and supportive therapy for toxin exposure**.
4. Recognize early warning signs of systemic complications from infection and poisoning.
5. Discuss preventive strategies including vaccination, hygiene, and environmental safety.
6. Interpret medico-legal and forensic aspects of accidental plant poisoning.
7. Integrate pathology, pharmacology, toxicology, and clinical reasoning into patient management.

#### Students Integrate (Implicitly)

- **Microbiology & Pathology:** Viral and fungal identification, tissue pathology, and co-infection implications.
- **Clinical Medicine:** Interpretation of systemic signs, complications, and multi-organ involvement.
- **Pharmacology:** Rational selection of antivirals, antifungals, and supportive therapy for toxic exposure.
- **Forensic Medicine & Toxicology:** Plant-derived toxin detection, risk assessment, and medico-legal documentation.
- **Public Health:** Prevention strategies, vaccination, and community education.
- **Clinical Reasoning:** Synthesizing lab, pharmacologic, toxicologic, and clinical findings to inform decision-making.

#### What Makes This Harden's Integration Level 11?

This case represents **Harden Level 11** as students manage a single, authentic patient scenario requiring **transdisciplinary reasoning**. Knowledge from microbiology, pathology, pharmacology, forensic medicine, and public health is **embedded within clinical decision-making**, with the patient case serving as the central organizing principle. Learning mirrors real-life emergency and complex care settings.

#### Teaching Format

- ❖ Small-group problem-based discussion (CBL)
- ❖ Laboratory simulation: viral PCR, fungal cultures, biochemical testing
- ❖ Pharmacy and pharmacology visits for rational drug therapy
- ❖ Toxicology demonstration and case analysis
- ❖ Role-play for patient counseling and environmental risk prevention
- ❖ Competency assessment:
  - Clinical reasoning
  - Therapeutic decision-making
  - Laboratory interpretation
  - Toxicology and medico-legal integration

#### Academic Justification Statement

This TCRF session integrates **viral, fungal, and toxicological knowledge** into **holistic patient care**. Students learn to diagnose co-infections, interpret lab results, design rational treatment plans, and assess toxic exposures. The single-patient approach ensures **deep transdisciplinary engagement**, linking microbiology, pathology, pharmacology, forensic medicine, and public health. It emphasizes **critical thinking, ethical reasoning, and practical problem-solving** required for real-world clinical practice.

## Subject Contribution in TCRF Session 5

Subject / Discipline	Nature of Contribution	Approx. Integration Weight (%)	Rationale
Pathology	Viral & fungal identification, co-infection pathology	25%	Mechanistic understanding
Microbiology	PCR, culture, and diagnostic interpretation	15%	Supports lab-based clinical reasoning
Pharmacology	Antiviral, antifungal, and supportive therapy	20%	Guides rational treatment
Forensic Medicine	Plant toxin analysis, post-exposure risk, documentation	15%	Legal and clinical integration
Medicine	Clinical assessment, systemic complications, co-morbidity management	15%	Core patient care
Community Medicine	Vaccination, hygiene, environmental prevention strategies	10%	Public health perspective

## Subject-Wise Specific Learning Objectives

Subject	Domain	Specific Learning Objectives (Students will be able to...)	Bloom's Level	Integration Role
Pathology	Disease Mechanism	Describe co-infection pathophysiology; interpret tissue and culture findings	Understand	Mechanistic foundation
Microbiology	Laboratory Skills	Identify viral and fungal pathogens using PCR, ELISA, culture, and biochemical tests	Apply	Diagnostic reasoning
Pharmacology	Therapeutics	Formulate integrated treatment plan; select and justify antivirals, antifungals, and supportive therapy	Analyze	Rational therapy
Forensic Medicine	Toxicology	Recognize plant toxin exposure, interpret findings, and document medico-legally	Analyze	Legal and clinical integration
Medicine	Clinical Care	Correlate lab and clinical findings; monitor for systemic complications; manage co-infections	Evaluate	Holistic patient care
Community Medicine	Public Health	Propose preventive strategies, vaccination, hygiene, and environmental safety	Create	Population-level impact

## Specific Learning Objectives – WEEK 6

CODE	TOPIC	LEARNING OBJECTIVES <i>At the end of the session student should be able to:</i>	LEARNING DOMAIN	CALGARY GAUGE	TEACHING STRATEGIES	ASSESSMENT TOOLS
<b>PATHOLOGY</b>						
	Candida	Explain Important properties of Candida -Describe its reproduction -Explain transmission, Pathogenesis and diseases caused by this organism -Relate the interaction of pathogenesis of this organism with immunity of individuals. -Explain clinical findings and its laboratory identification - Describe treatment and prevention of Candida	C1 C2 C2 C2 C1 C2		CBL	MCQS, SEQS, OSPE
	Opportunistic mycosis	Identify the morphology of fungi •Describe the important features of opportunistic fungal diseases •Explain co-morbidities •Describe laboratory diagnosis	C1 C1 C2 C2		CBL	MCQS, SEQS, OSPE
	Dengue fever, Pathological aspects and Lab Diagnosis	Identify the morphology of fungi •Describe the important features of systemic fungal diseases •Describe laboratory diagnosis of systemic fungi	C2 C2 C2		LGIS	SEQS, MCQS,
	Varicella zoster and Cytomegalovirus	Explain the transmission and pathogenesis Relate the interaction of pathogenesis of viruses with immunity of individual -Explain clinical findings, Lab diagnosis -Describe treatment and prevention. -discuss the reactivation of disease.	C2 C3 C2 C2 C2		LGIS	SEQS, MCQS,
	Respiratory Virus	Explain the important properties of respiratory viruses •Describe Replicative cycle	C2 C2 C2 C3 C2		LGIS	SEQS, MCQS, OSPE

		<ul style="list-style-type: none"> <li>•Explain the transmission and pathogenesis of the diseases caused by these viruses</li> <li>•Explain the interaction of pathogenesis of viruses &amp; immunity of individuals</li> <li>•Explain clinical findings and its laboratory identification</li> <li>•Describe the treatment &amp; Prevention</li> </ul>	C2			
<b>PHARMACOLOGY</b>						
	Anticancer Agents I	Classify anti-cancer drugs -Explain the term cell-cycle specific and cell cycle non-specific -Enumerate cell-cycle specific and cell cycle non-specific drugs	C1 C2 C1		LGIS	MCQS, SEQS
	Anticancer Agents II	Describe the log kill hypothesis Describe advantages of combination anticancer therapy Describe adverse effects common to anti-cancer drugs (shared toxicities)	C2 C2 C2		LGIS	MCQS, SEQS
<b>FORENSIC MEDICINE</b>						
<b>SURGERY</b>						
<b>MEDICINE</b>						
	Influenza	Recall epidemiology of influenza. Describe clinical findings. Describe abnormal lab investigations. Recognize complications of influenza. Describe management/treatment of infection	C2, A3 C2, A3 C2, A3 C2, A3		LGIS	SEQS, MCQS, OSPE
	Dengue fever, sign, symptoms and treatment	Describe pathophysiology of dengue infection. •Recognize signs and symptoms of dengue fever.  •Differentiate between DF, DHF, DSS on basis of symptoms, signs and lab parameters.	C3 C3 C3 C2, C3		LGIS	MCQS, VIVA

		•Discuss investigations and management of dengue fever.				
<b>PEADS</b>						
	Pediatrics presentation of dengue fever	Describe the diverse clinical manifestations of dengue fever in children. Identify key warning signs of severe dengue in pediatric patients. Outline the diagnostic approaches for dengue fever in children. Summarize the principles of fluid management in pediatric dengue cases.	C3 C2 C2 C2		LGIS	SEQS, OSPE, MCQS
<b>DID</b>						
	Preventive measures and spread of dengue fever	Define dengue fever Describe the mode of transmission and spread of dengue fever Discuss the breeding sites and role of Aedes mosquito in spread of dengue Explain preventive measures for control of dengue fever Describe community-based strategies for dengue prevention Discuss personal protective measures against mosquito bites	C1 C2  C2  C2  C2		LGIS	SEQS, MCQS, OSPE

**Transdisciplinary Clinical–Reasoning Forum (TCRF-6)**  
**Theme 6**

**Theme: Infectious Frontiers: Fungi, Viruses, and Toxic Insights**

Theme	Week	Topic	Clinical Case Scenario
Theme 6	Week 6	Integrated Management of Viral-Fungal Co-Infection with Toxic Exposure	A child presents to the pediatric emergency unit with high-grade fever, generalized rash, painful oral ulcers, and white patches on the tongue for 3 days.

## “Pediatric Fever, Rash, Oral Lesions, Toxin”

### Clinical Scenario

A 10-year-old child presents to the pediatric emergency unit with **high-grade fever, generalized rash, painful oral ulcers, and white patches on the tongue** for 3 days. The caregiver reports **recent ingestion of a small amount of castor seeds** while playing outdoors. The child has a history of mild immunodeficiency.

On examination:

- Temp: 39°C, BP: 95/60 mmHg, HR: 120 bpm
- Oral candidiasis (white patches), vesicular rash consistent with **varicella-zoster virus (VZV)**
- Mild hepatomegaly and dehydration
- Neurologically alert but lethargic

Investigations reveal:

- CBC: Leukopenia (3,500/mm<sup>3</sup>), thrombocytopenia (100,000/mm<sup>3</sup>)
- LFTs: Mildly elevated AST/ALT
- Viral PCR: Positive for VZV; HSV IgM positive
- Fungal culture: *Candida albicans* isolated from oral swabs
- Urine & serum: Ricin detected (castor seed ingestion)

The clinical team coordinates **laboratory diagnostics, pathology assessment, pharmacologic therapy, and forensic toxicology evaluation** for comprehensive patient care.

### Student Task (Problem-Based Trigger)

Students are asked to:

1. Identify viral and fungal pathogens and interpret clinical relevance in an immunocompromised pediatric patient.
2. Correlate lab results (PCR, ELISA, cultures, microscopy) with clinical presentation and severity.
3. Formulate a **combined treatment plan** including antivirals, antifungals, and supportive care for toxin exposure.
4. Recognize early warning signs of complications in pediatric and immunocompromised populations.
5. Discuss preventive strategies, including vaccination and environmental safety.
6. Interpret medico-legal aspects of plant toxin exposure.
7. Integrate pathology, pharmacology, clinical medicine, and toxicology into holistic patient management.

### Students Integrate (Implicitly)

- Microbiology & Pathology: Viral (HSV, VZV) and fungal (*Candida*, opportunistic mycoses) identification, tissue pathology, co-infection effects.
- Clinical Medicine: Pediatric assessment, immunocompromised presentations, complications, and co-morbidities.
- Pharmacology: Rational antiviral and antifungal therapy selection, P-drug principles, dosage adjustments for children.
- Forensic Medicine & Toxicology: Detection of plant-derived toxins, post-exposure monitoring, and medico-legal documentation.
- Public Health: Vaccination, hygiene, community awareness, and environmental risk prevention.
- Clinical Reasoning: Synthesizing lab, pharmacologic, toxicologic, and clinical data for patient-centered decision-making.

### What Makes This Harden’s Integration Level 11?

This scenario exemplifies **Harden Level 11 (Transdisciplinary Integration)** as students manage a **single, authentic pediatric patient** with viral-fungal co-infection and toxic exposure. Subject knowledge is **embedded in clinical reasoning**, with laboratory, pharmacological, pathological, forensic, and public health perspectives seamlessly integrated. Learning mirrors real-world emergency care for complex infectious and toxicological presentations.

**Teaching Format**

- ❖ Small-group case-based learning (CBL)
- ❖ Laboratory demonstrations: PCR, ELISA, fungal microscopy and culture
- ❖ Pharmacology sessions: P-drug prescription for pediatric antiviral and antifungal therapy
- ❖ Forensic medicine demonstration: vegetable toxin analysis and postmortem interpretation
- ❖ Role-play: counseling caregiver regarding infection, treatment, and preventive measures
- ❖ Competency assessment based on:
  - Clinical reasoning
  - Therapeutic decision-making
  - Laboratory interpretation
  - Toxicology and pediatric patient care

**Academic Justification Statement**

This TCRF session integrates **viral, fungal, and toxicological knowledge** into **holistic pediatric care**. Students develop the ability to diagnose co-infections, interpret lab results, formulate rational pharmacologic treatment, and assess toxic exposures in children with immunocompromised conditions. The single-patient approach ensures **deep transdisciplinary engagement**, combining microbiology, pathology, pharmacology, forensic medicine, clinical pediatrics, and public health. Students practice **critical thinking, ethical reasoning, and applied clinical decision-making** in a complex real-world scenario.

**Subject Contribution in TCRF Session 6**

Subject / Discipline	Nature of Contribution	Approx. Integration Weight (%)	Rationale
Pathology	Viral & fungal tissue pathology, lab diagnostics	25%	Mechanistic understanding
Microbiology	PCR, culture, microscopy, diagnostic interpretation	15%	Laboratory-based clinical reasoning
Pharmacology	Pediatric antiviral & antifungal therapy, supportive care	20%	Guides rational treatment
Forensic Medicine	Plant toxin detection, post-exposure risk assessment	15%	Legal and clinical integration
Medicine / Pediatrics	Pediatric clinical care, co-morbidity management	15%	Patient-centered care
Community Medicine	Vaccination, hygiene, environmental safety	10%	Population-level prevention

## Subject-Wise Specific Learning Objectives

<b>Subject</b>	<b>Domain</b>	<b>Specific Learning Objectives (Students will be able to...)</b>	<b>Bloom's Level</b>	<b>Integration Role</b>
Pathology	Disease Mechanism	Describe viral and fungal pathophysiology; interpret tissue and lab findings	Understand	Mechanistic foundation
Microbiology	Laboratory Skills	Identify viral and fungal pathogens using PCR, ELISA, culture, and microscopy	Apply	Diagnostic reasoning
Pharmacology	Therapeutics	Formulate integrated treatment plan; select pediatric antivirals, antifungals, and supportive therapy	Analyze	Rational therapy
Forensic Medicine	Toxicology	Recognize plant toxin exposure, interpret findings, and document medico-legally	Analyze	Legal and clinical integration
Medicine / Pediatrics	Clinical Care	Correlate lab and clinical findings; manage pediatric co-infections and monitor complications	Evaluate	Holistic patient care
Community Medicine	Public Health	Propose preventive strategies, vaccination, hygiene, and environmental safety	Create	Population-level impact

# SYLLABUS FOR LEARNING MANAGEMENT SYSTEM

## PHARMACOLOGY SDL TOPICS

Sr #	Topics Of SDL	Learning Objectives	Learning resources
1.	New antibiotic development and strategies to manage antimicrobial resistance	<ul style="list-style-type: none"> <li>Outline the process of new antibiotic development</li> <li>Identify the mechanism of antimicrobial resistance</li> <li>Describe the strategies to tackle AMR</li> </ul>	<p>Boyd NK, Teng C, Frei CR. Brief overview of approaches and challenges in new antibiotic development: a focus on drug repurposing. <i>Frontiers in cellular and microbiology infection</i>. 2021 May 17;11:684515.</p> <p>Walesch S, Birkelbach J, Jézéquel G, Haeckl FJ, Hegemann JD, Hesterkamp T, Hirsch AK, Hammann P, Müller R. Fighting antibiotic resistance—strategies and (pre) clinical developments to find new antibacterials. <i>EMBO reports</i>. 2023 Jan 9;24(1):e56033.</p>
2.	MRSA and VRSA infections	<ul style="list-style-type: none"> <li>Enumerate drugs used for MRSA and VRSA</li> <li>Describe their mechanism of action</li> <li>Discuss mechanism of vancomycin resistance</li> </ul>	<p>Staphylococcus aureus (MRSA) (Beyond the Basics)  <a href="https://www.uptodate.com/contents/methicillin-resistant-staphylococcus-aureus-mrsa-beyond-the-basics">https://www.uptodate.com/contents/methicillin-resistant-staphylococcus-aureus-mrsa-beyond-the-basics</a></p> <p>Warren Rose, Cecilia Volk, Thomas J Dilworth, George Sakoulas, approaching 65 Years: Is It Time to Consider Retirement of Vancomycin for Treating Methicillin-Resistant <i>Staphylococcus aureus</i> Endovascular Infections?, <i>Open Forum Infectious Diseases</i>, Volume 9, Issue 5, May 2022,</p>
3.	Macrolides and viral infections: focus on azithromycin in COVID-19 pathology	<ul style="list-style-type: none"> <li>Classify macrolides</li> <li>Described the mechanism of action of macrolides</li> <li>Discuss the use of macrolides for viral infections</li> </ul>	<p>Pani A, Lauriola M, Romandini A, Scaglione F. <b>Macrolides and viral infections: focus on azithromycin in COVID-19 pathology</b>. <i>Int J Antimicrob Agents</i>. 2020 Aug;56(2):106053. doi: 10.1016/j.ijantimicag.2020.106053. Epub 2020 Jun 10. PMID: 32534189; PMCID: PMC7286256</p>
4.	Aminoglycosides against Gram negative	<ul style="list-style-type: none"> <li>Classify aminoglycosides</li> <li>Discuss the multimodal mechanism of action of aminoglycosides</li> </ul>	<p>Lang M, Carvalho A, Baharoglu Z, Mazel D.2023. <b>Aminoglycoside uptake, stress, and potentiation in Gram-negative bacteria: new therapies with old molecules</b>. <i>Microbiol Mol Biol Rev</i>87:e00036-22. <a href="https://doi.org/10.1128/mnbr.00036-22">https://doi.org/10.1128/mnbr.00036-22</a></p>
5.	Antiviral drugs for SARS-CoV	<ul style="list-style-type: none"> <li>Classify antiviral drugs</li> <li>Describe the mechanism of action of antiviral drugs</li> <li>Discuss the uses and adverse effects of antiviral drugs</li> <li>Enumerate drugs used for SARS-CoV</li> </ul>	<p>Jeon S, Ko M, Lee J, Choi I, Byun SY, Park S, Shum D, Kim S. 2020. <b>Identification of Antiviral Drug Candidates against SARS-CoV-2 from FDA-Approved Drugs</b>. <i>Antimicrob Agents Chemother</i> 64:10.1128/aac.00819-20.</p>

6.	Analysis of anticancer drugs	<ul style="list-style-type: none"> <li>Classify anticancer drugs</li> <li>Discuss the latest advancements in cancer chemotherapy</li> <li>Describe the adverse effects of anticancer drugs</li> </ul>	<p>Dallavalle S, Dobričić V, Lazzarato L, Gazzano E, Machuqueiro M, Pajeva I, Tsakovska I, Zidar N, Fruttero R. <b>Improvement of conventional anti-cancer drugs as new tools against multidrug resistant tumors</b>. Drug Resistance Updates. 2020 May 1;50:100682.</p> <p>Groenland SL, Scherf-Clavel O, van Dyk M, Huisinga W, Michelet R, Jaehde U, Steeghs N, Huitema AD, Kloft C. <b>Therapeutic drug monitoring of oral targeted antineoplastic drugs</b>. European journal of clinical pharmacology. 2021 Apr;77:441-64.</p>
----	------------------------------	---	--

### PATHOLOGY SELF-DIRECTED LEARNING (SDL)

Topic	At The End of The Session Student Should Be Able To	C/P/A	Teaching Strategy	Assessment Tool
Structure of Bacterial cell	Differentiate between structure of gram positive and gram-negative bacterial cell wall	C3	SDL	MCQs, SEQs, OSPE, Viva
	Correlate structural components of bacteria with their pathogenicity	C3		
	Define plasmid, transposon, mesosome, glycocalyx.	C1		
Bacterial metabolism and Growth curve	Define each phase of growth cycle	C1	SDL	MCQs, SEQs, OSPE
	Differentiate between aerobic and anaerobic growth	C3		
	Explain fermentation of sugars	C2		
	Discuss iron metabolism	C2		
	Define each phase of growth cycle	C2		
Pathogenesis of Infectious agent in Microbiology	Define different terminologies	C1	SDL	MCQs, SEQs, OSPE
	Explain modes of transmission and adherence and entry in host cell	C2		
	Explain mechanism of action of important toxins	C2		
	Differentiate between exotoxin and endotoxin	C2		
	Explain Koch's postulates	C2		
	Identify different lab test	C1		
	Describe principle of different lab test	C2		
	Interpret various lab tests for different diseases	C3		
Sterilization and Disinfection	Define Chemical disinfectants	C1	SDL	MCQs, SEQs, OSPE
	Categorize chemical disinfectants	C2		
	Explain physical methods of disinfection and sterilization	C2		
Klebsiella, shigella, vibrio cholera	Describe Important properties, epidemiology of vibrio cholerae and shigella	C2	SDL	MCQs, SEQs, OSPE
	-Describe transmission, pathogenesis, signs and symptoms, laboratory diagnosis and treatment of Shigella and Vibrio Cholerae	C2		
	-Enumerate different types of vibriion	C1		
	-Discuss pathogenesis of cholera and shigellosis.	C2		
	-Identify diagnostic tests available for vibrio cholera and its treatment	C3		
	-Discuss interpretation of TSI	C2		
	Describe Important properties, epidemiology of vibrio cholerae and shigella	C2		
	-Discuss related diseases of Helicobacter and Campylobacter C2,	C2		

<b>Helicobacter and Campylobacter</b>	Discuss pathogenesis and laboratory diagnosis of Campylobacter and Helicobacter C2,	C2	MCQs, SEQs, OSPE
---------------------------------------	---	----	------------------

**BEHAVIORAL SCIENCES SDL TOPICS**

No.	Topic	Learning Objectives
1	Defense Mechanism	<p>The student should be able to</p> <ul style="list-style-type: none"> <li>Identify common defense mechanisms and their adaptive and maladaptive aspects.</li> <li>Explore the psychoanalytic perspective on defense mechanisms and their application in clinical practice.</li> </ul>
2	Unexplained Somatic Complaints/ persistent Complainers	<p>The student should be able to</p> <ul style="list-style-type: none"> <li>Recognize the role of psychological factors in the manifestation and management of medically unexplained symptoms.</li> <li>Develop skills in conducting thorough psychosocial assessments and implementing biopsychosocial interventions for patients with somatic complaint</li> </ul>
3	Dissociative ad possession states	<p>The student should be able to</p> <ul style="list-style-type: none"> <li>Define and differentiate dissociative disorders and possession states.</li> <li>Recognize clinical manifestations and diagnostic criteria.</li> <li>Identify risk factors and triggers, such as trauma and stress.</li> <li>Identify evidence-based approaches, including psychotherapy and pharmacotherapy.</li> <li>Cultural Considerations and Stigma:</li> <li>Address stigma and promote culturally competent care.</li> </ul>
4	Psychosocial aspects of Gender and sexual identity and sexual behavior	<p>The student should be able to</p> <ul style="list-style-type: none"> <li>Examine the psychosocial factors shaping gender identity, sexual orientation, and sexual behavior.</li> <li>Understand the impact of societal norms, culture, and stigma on gender and sexual minorities.</li> <li>Explore the intersectionality of gender, sexual orientation, race, ethnicity, and other identities in shaping individual experiences and identities.</li> </ul>

**SCHEDULE OF SDL TOPICS**

Subjects	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Behavior science	Defense Mechanism	Unexplained Somatic Complaints/ persistent Complainers	Dissociative ad possession states	Psychosocial aspects of Gender and sexual identity and sexual behavior		
Forensic science	Inebriants Alcohol	Agriculture Poisons OPC	Inorganic irritants Metallic Poisons (Arsenic)	Inorganic irritants Metallic Poisons ( Lead)	Non-Metallic Poisons (Phosphorus & Iodine )	Spinal Poisons Strychnine (Nux Vomica)
Pharmacology	New antibiotic development and strategies to manage antimicrobial resistance	MRSA and VRSA infections	Macrolides and viral infections: focus on azithromycin in COVID-19 pathology	Aminoglycosides against Gram negative	Antiviral drugs for SARS-CoV	Analysis of anticancer drugs
Pathology	Structure of Bacterial cell	Bacterial metabolism and Growth curve	Pathogenesis of Infectious agent in Microbiology	Sterilization and Disinfection	Klebsiella, shigella, vibrio cholera	Helicobacter and Campylobacter

**DISTRIBUTION OF TEACHING HOURS OF DISCIPLINES**

SR No.	Disciplines	LGIS	SGD	CBL	SDL	Hours
1.	Pharmacology	18	04		06	28
2.	Pathology	15	04.5	08	04.5	34
3.	Forensic Medicine	06	0	03	0	9
4.	Community Medicine	02	0	0	0	02
5.	Surgery	05	0	0	0	05
6.	-Medicine -Department of Infectious diseases (DID)	07 01	0	0	0	08
7.	Peads	05	0	0	0	05
8.	Behavioral Sciences	02	0	0	0	02
9.	Quran Class	01	0	0	0	01
10.	Family Medicine	03	0	0	0	03
11.	Medical Ethics	01	0	01	0	02
12.	Biochemistry	01	0	0	0	01
13.	Gynecology	01	0	0	0	01
	Total Hours = 97					

**Practical and Clinical Clerkship hours**

Disciplines	Practical hours	Disciplines	Clerkship hours
Pharmacology	2x5 = 10 hrs	Surgery	3 x 4 x5= 60 hrs
Pathology	2x5 = 10hrs	Medicine	3 x 4 x5= 60 hrs
Forensic Medicine	2x5 = 10 hrs	Sub Specialty	3 x 4 x5= 60hrs

- LGIS (L) \*
- SGD (S) \*\*
- CBL (C) \*\*\*
- SDL (SL) \*\*\*\*

## **SECTION VI**

### **CLINICAL CLERKSHIP**

## **EMBEDDED INTERNSHIP (Level 12)**

### ***Theme Based Clinical Training***

#### **1. Program Overview**

The 3rd Year MBBS Clinical Clerkship at Rawalpindi Medical University (RMU) is designed as a structured, competency-driven, Level 12 embedded clinical training model. At this stage, students transition from supervised academic learners to progressively independent clinical participants. The program emphasizes immersive patient care exposure, deliberate practice, interdisciplinary integration, reflective learning, and longitudinal competency tracking. Unlike traditional block rotations that isolate disciplines, RMU adopts a **theme-based embedded structure**, where allied specialties are integrated within broader clinical streams. This ensures continuity in clinical reasoning, patient care responsibility, and professional identity formation.

The clerkship prioritizes:

- Authentic clinical participation
- Early subspecialty exposure
- Competency-based progression
- Structured formative feedback
- Reflective practice
- Continuous internal assessment
- Longitudinal skill development

Students are expected to function as active members of clinical teams rather than passive observers.

## **2. Educational Philosophy**

The RMU Level 12 Embedded Clerkship is grounded in:

- Competency-Based Medical Education (CBME)
- Experiential learning through clinical immersion
- Progressive scaffolding of autonomy
- Continuous formative assessment
- Reflective and self-directed learning
- Interdisciplinary integration
- Patient-centered professionalism

Clinical learning is organized around patient presentations and themes, not isolated subject boundaries. Students develop clinical reasoning across systems rather than within silos.

## **3. Theme-Based Integrated Structure**

The clerkship is organized into integrated clinical themes embedded within three major streams

### **3.1 Surgical Stream (10 Weeks Rotation)**

Themes emphasize procedural exposure, surgical reasoning, and perioperative care and students experience

- Acute surgical presentations
- Trauma and emergency care
- Operative indications
- Post-operative monitoring
- Procedural skill development under supervision

### **3.2 Medicine Stream (10 Weeks Rotation)**

Themes emphasize chronic disease management, systemic evaluation, and community-based care where students engage in:

- Outpatient clinics
- Ward rounds

- Multidisciplinary discussions
- Community and psychosocial assessments
- Longitudinal patient follow-up
- The theme-based structure ensures exposure to:
  - Acute conditions
  - Chronic diseases
  - Surgical decision-making
  - Medical management
  - Community care
  - Mental health integration

### **3.3 Medicine Allied Stream (02 Week Rotation Each)**

Themes emphasize chronic disease management, systemic evaluation, and community-based care.

Specialties include:

- Gastroenterology
- Radiology
- Department of Infectious Disease
- Emergency Medicine
- Skill Lab

### **4. Core Learning Outcomes (Level 12 Competency Expectations)**

Upon completion of the 3rd Year Clerkship, students will be able to:

1. Conduct focused clinical history and examination across subspecialties
2. Perform selected procedural skills safely under supervision
3. Formulate prioritized differential diagnoses
4. Develop rational investigation plans
5. Participate in multidisciplinary case discussions
6. Communicate effectively with patients and healthcare teams
7. Apply ethical and professional standards consistently

8. Demonstrate reflective clinical learning
9. Show emerging independent clinical judgment

These outcomes align with Level 12 expectations of embedded participation and progressive autonomy.

### **5. Assessment Model – 40% Continuous Internal Assessment (CIA)**

RMU distinguishes itself through a robust Continuous Internal Assessment system.

#### **CIA Structure:**

- **30% Theory & Clinical Assessments**
- **10% LMS-based assessments**

CIA evaluates:

- Clinical skills performance
- Case presentations
- Bedside participation
- Procedural competence
- Professionalism
- Logbook completion
- Reflective portfolio entries

Continuous assessment ensures:

- Sustained engagement
- Real-time feedback
- Early identification of learning gaps
- Remediation opportunities

- Skill consolidation over time

Competence is evaluated longitudinally rather than through a single high-stakes examination.

## **6. Progressive Scaffolding of Autonomy**

The Level 12 clerkship follows a structured autonomy model:

### **Stage 1 — Guided Participation**

Students observe and assist in patient care.

### **Stage 2 — Supervised Performance**

Students perform clinical tasks with structured faculty oversight.

### **Stage 3 — Supported Independence**

Students lead patient encounters with supervision available.

Each rotation increases responsibility while maintaining safety and accountability.

This scaffolding:

- Builds confidence
- Reduces cognitive overload
- Encourages reflective learning
- Reinforces mastery through repetition
- Develops clinical judgment

Competence emerges through repeated exposure, structured feedback, and deliberate practice.

## **7. Level 12 Embedded Clerkship Model**

The RMU Level 12 model integrates:

- Vertical curriculum alignment

- Interdisciplinary collaboration
- Competency mapping
- Longitudinal evaluation
- Reflective learning cycles

Students follow patients across services, linking classroom knowledge to real clinical decision-making.

This embedded design:

- Prevents fragmented learning
- Promotes continuity of care understanding
- Encourages systems thinking
- Strengthens teamwork skills
- Supports professional identity formation

Students learn not only clinical content but also how to function within healthcare systems.

## **8. Development of Self-Directed Lifelong Learners**

The clerkship intentionally cultivates:

- Self-assessment skills
- Adaptive expertise
- Curiosity-driven inquiry
- Evidence-based reasoning
- Professional resilience

Students maintain portfolios, set learning goals, and engage in guided reflection.

They learn to:

- Identify personal knowledge gaps
- Seek evidence independently
- Critically appraise information
- Update clinical reasoning continuously

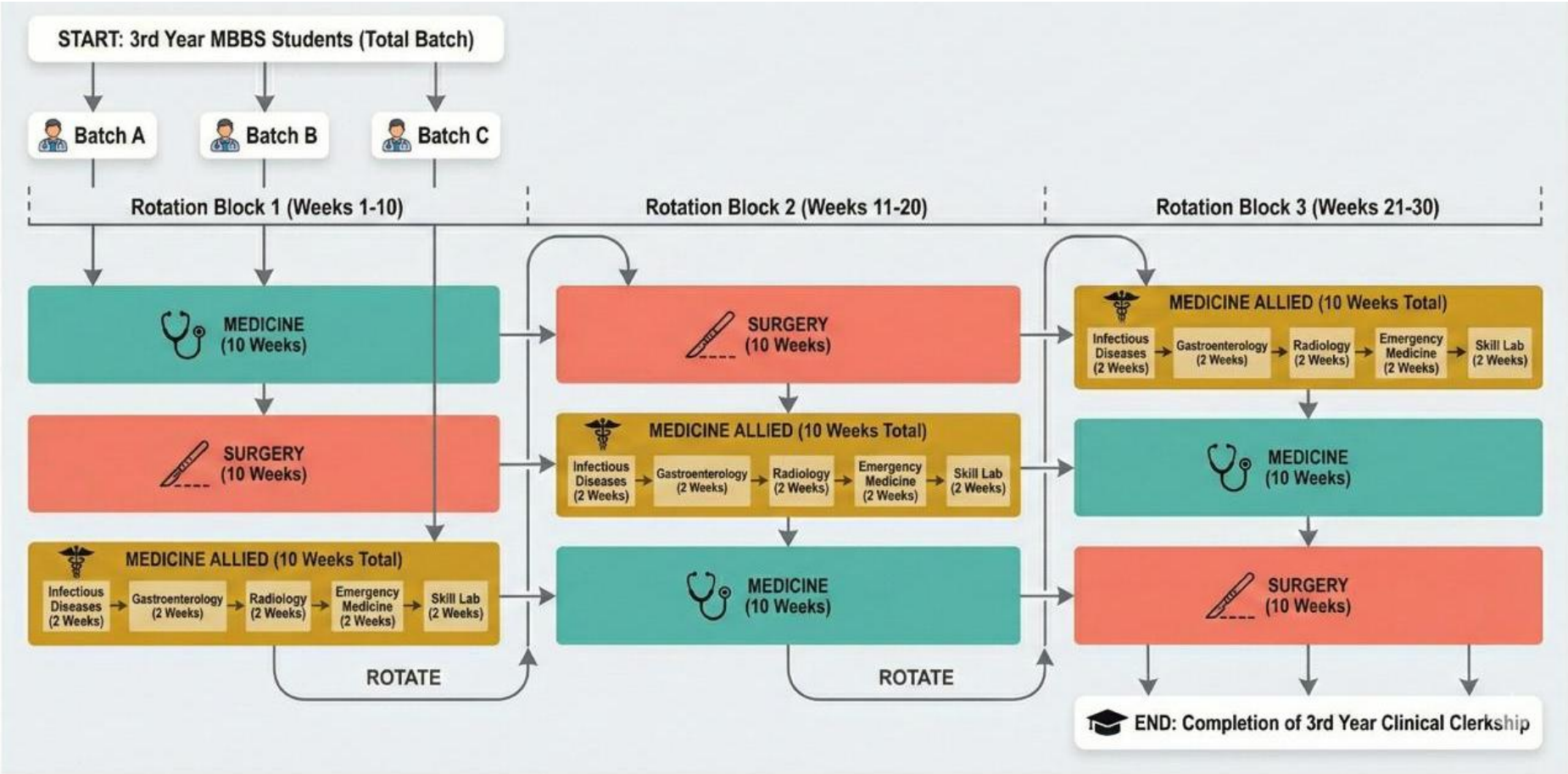
The goal is transformation from exam-focused learners into evolving, self-sustaining professionals.

## **9. Distinctive Features of the RMU Level 12 Model**

Compared to traditional clerkship systems, RMU stands out by:

- Early subspecialty integration
- Embedded participation within clinical teams
- Strong 40% continuous internal assessment
- Structured scaffolding of independence
- Longitudinal competency tracking
- Emphasis on reflective growth
- Alignment with national and international competency frameworks
- The outcome is a graduate who is:
  - Clinically competent
  - Adaptable
  - Ethical
  - Reflective
  - Team-oriented
  - Prepared for increasing responsibility in final year and house job

### 3<sup>rd</sup> YEAR MBBS CLINICAL CLERKSHIP ROTATION PLAN



**SECTION VII**  
**LEARNING RESOURCES**

Subjects	Resources
<b>Core Subjects &amp; Horizontal Integration Subjects</b>	
Anatomy	<p><b>1. Gross Anatomy</b></p> <ol style="list-style-type: none"> <li>2. Gray's Anatomy by Prof. Susan Standring 42th edition, Elsevier.</li> <li>3. Clinical Anatomy for Medical Students by Richard S. Snell 10<sup>th</sup> edition.</li> <li>4. Clinically Oriented Anatomy by Keith Moore 9<sup>th</sup> edition.</li> <li>5. Cunningham's Manual of Practical Anatomy by G.J. Romanes, 16th edition, Vol-I, II and III</li> <li>6. <a href="http://www.anatomyzone.com">http://www.anatomyzone.com</a>  <a href="http://www.3d-anatomy.com">http://www.3d-anatomy.com</a>  <a href="https://teachmeanatomy.info/">https://teachmeanatomy.info/</a></li> </ol> <p><b>B. Histology</b></p> <ol style="list-style-type: none"> <li>1. B. Young J. W. Health Wheather's Functional Histology 6<sup>th</sup> edition.</li> <li>2. Medical Histology by Prof. Laiq Hussain 7<sup>th</sup> edition.</li> <li>3. <a href="https://www.udemy.com/course/histology/">https://www.udemy.com/course/histology/</a></li> </ol> <p><b>C. Embryology</b></p> <ol style="list-style-type: none"> <li>1. Keith L. Moore. The Developing Human 11<sup>th</sup> edition.</li> <li>2. Langman's Medical Embryology 14<sup>th</sup> edition.</li> </ol>
Physiology	<p><b>A. Textbooks</b></p> <ol style="list-style-type: none"> <li>1. Textbook Of Medical Physiology by Guyton and Hall 14<sup>th</sup> edition.</li> <li>2. Ganong 'S Review of Medical Physiology 26<sup>th</sup> edition.</li> </ol> <p><b>B. Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Human Physiology by Lauralee Sherwood 10<sup>th</sup> edition.</li> <li>2. Berne &amp; Levy Physiology 7<sup>th</sup> edition.</li> <li>3. Best &amp; Taylor Physiological Basis of Medical Practice 13<sup>th</sup> edition.</li> <li>4. Guyton &amp; Hall Physiological Review 3<sup>rd</sup> edition.</li> </ol>
Biochemistry	<p><b>Textbooks</b></p> <ol style="list-style-type: none"> <li>1. Lippincott Illustrated Reviews: Biochemistry – Wolters Kluwer</li> <li>2. Harper's Illustrated Biochemistry 32th edition.</li> <li>3. Lehninger Principle of Biochemistry 8<sup>th</sup> edition.</li> <li>4. Biochemistry by Devlin 7<sup>th</sup> edition.</li> </ol>

Community Medicine	<b>Textbooks</b> <ol style="list-style-type: none"> <li>1. Community Medicine by Parikh 25<sup>th</sup> edition.</li> <li>2. Community Medicine by M Illyas 8<sup>th</sup> edition.</li> <li>3. Basic Statistics for the Health Sciences by Jan W Kuzma 5<sup>th</sup> edition.</li> </ol>
Pathology/Microbiology	<b>Textbooks</b> <ol style="list-style-type: none"> <li>1. Robbins &amp; Cotran, Pathologic Basis of Disease, 10<sup>th</sup> edition.</li> <li>2. Rapid Review Pathology, 5<sup>th</sup> edition by Edward F. Goljan MD.</li> </ol> <a href="http://library.med.utah.edu/WebPath/webpath.html">http://library.med.utah.edu/WebPath/webpath.html</a>
Pharmacology	<b>Textbooks</b> Basic and Clinical Pharmacology, 16 <sup>th</sup> edition
<b>Spiral Integration Subjects &amp; General Education Cluster Courses</b>	
Bioethics	<b>Textbooks</b> Textbook of Medical Ethics by Erich H. Loewy (Author)
Videography	The Five Cs of Cinematography by Joseph V. Mascelli Digital Video Production: A Comprehensive Guide by Anirban Das
Leadership	Leadership and the New Science by Margaret J. Wheatley A Treatise on Good Works by Martin Luther
Family Medicine	<b>Textbooks</b> <ol style="list-style-type: none"> <li>1. Textbook of Family Medicine" by Robert E. Rakel and David P. Rakel</li> <li>2. Essentials of Family Medicine" by Philip D. Sloane, Lisa M. Slatt, and others</li> <li>3. Textbook of Family Medicine" by Ian R. McWhinney</li> <li>4. Family Medicine: Principles and Practice" by Robert B. Taylor</li> </ol>
Islamiyat & Pak Studies	Islamiyat Lazmi by Muhammad Khalil
<b>Vertical Integration Subjects</b>	
Medicine	<b>Textbooks</b> <ol style="list-style-type: none"> <li>1. Harrison's Principles of Internal Medicine by J. Larry Jameson, Anthony S. Fauci, and others</li> <li>2. Davidson's Principles and Practice of Medicine by Stuart H. Ralston, Ian D. Penman, and others</li> <li>3. Kumar and Clark's Clinical Medicine by Parveen Kumar and Michael Clark</li> </ol>

	Oxford Handbook of Clinical Medicine by Ian B. Wilkinson, Tim Raine, and others
Surgery	<b>Textbooks</b> 1. Bailey & Love's Short Practice of Surgery by Norman S. Williams, P. Ronan O'Connell, and Andrew W. McCaskie
Obstetrics & Gynecology	<b>Textbooks</b> 1. Obstetrics by Ten Teachers 2. Gynaecology by Ten Teachers
Pediatrics	<b>Textbooks</b> Nelson Textbook of Pediatrics" by Robert M. Kliegman, Joseph St. Geme, and others
<b>Digital Resources</b>	
Up To Date	<a href="https://www.uptodate.com/contents/search">https://www.uptodate.com/contents/search</a>
RMU Digital library	<a href="http://www.digitallibrary.edu.pk/rmc.html">http://www.digitallibrary.edu.pk/rmc.html</a>
<b>International Resources</b>	
USMLE	<a href="https://www.usmle.org/">https://www.usmle.org/</a>
Plab	<a href="https://www.gmc-uk.org/registration-and-licensing/join-the-register/plab">https://www.gmc-uk.org/registration-and-licensing/join-the-register/plab</a>
U World	<a href="https://www.uworld.com/">https://www.uworld.com/</a>
Kaplan	<a href="https://mykaplan.co.uk/">https://mykaplan.co.uk/</a>

## **SECTION – VIII**

**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**

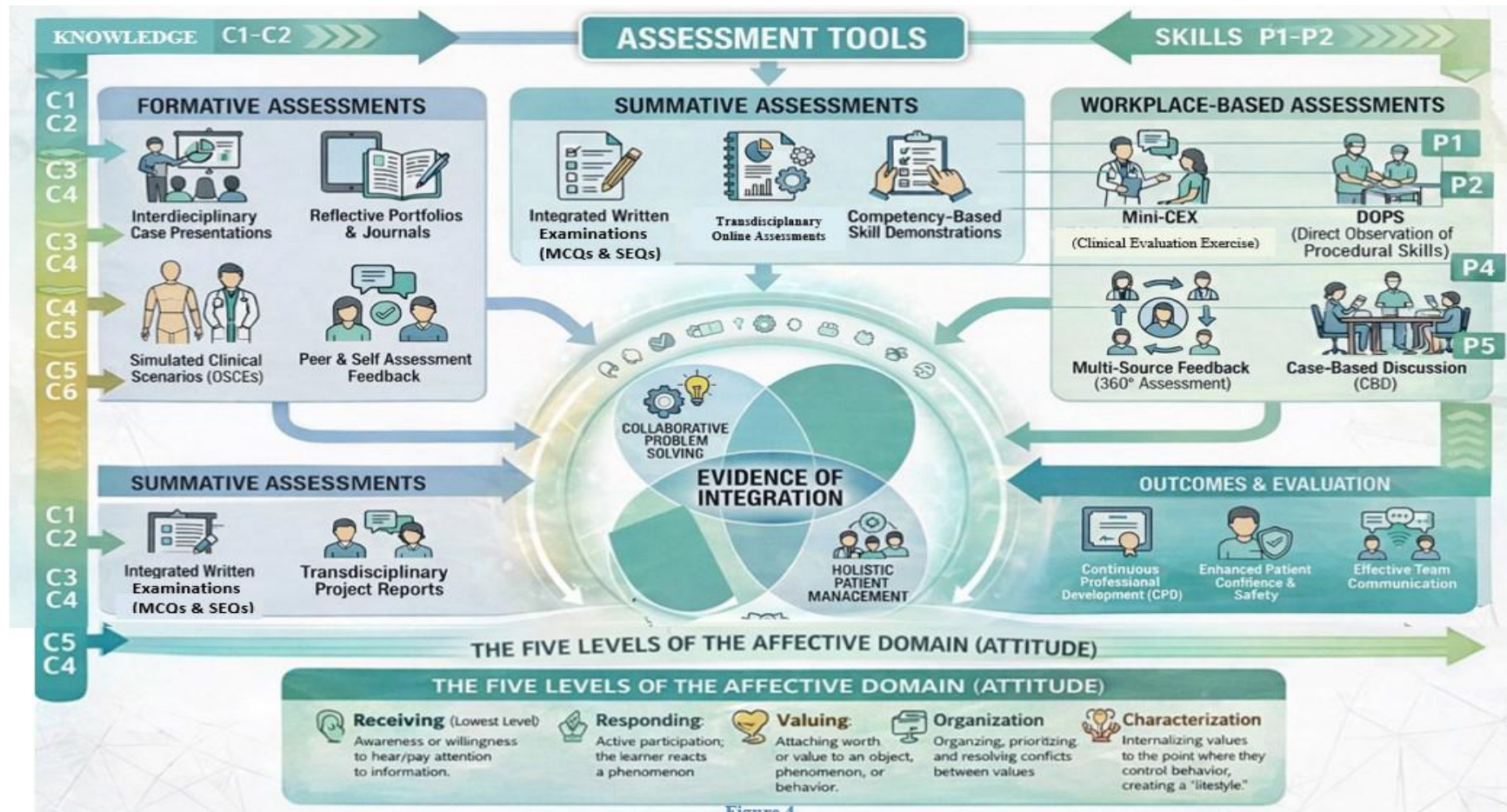


Figure 4

## Assessment Policy

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

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

### **3. Forms of assessments**

#### **Formative Assessment**

A formative assessment refers to a low-stakes assessment that does not normally contribute towards a student's final grade. A formative assessment may include summarizing the main points in a lecture or a weekly quiz to test comprehension of the reviewed content.

(assessment for learning) is carried out through modules and clerkships using various strategies (at the discretion of module coordinators and clerkship directors) feedback. Formative assessment performance may be taken as a continuous assessment.

#### **Summative Assessment**

A summative assessment is any method of evaluation performed at the end of a unit that allows a teacher to measure a student's understanding, typically against standardized criteria. Assessment of learning takes place at the end of modules/ blocks and clerkships and comprises of:

##### **Written Component:**

Cognitive competence is tested in the theory component using the following tool of assessment

- o USMLE/ PLAB Type / Multiple Choice Questions (MCQs)
- o USMLE/ PLAB Type / Extended Match Questions (EMQ)
- o Short Answer Questions (SAQs)
- o Short Essay Questions (SEQs)

##### **Practical Component:**

- Competence in psychomotor and affect domains is tested in practical components using the following tools of assessment
  - o Audio Visual OSPE (AVOSPE): This comprises of stations using PowerPoint slides with images, animations and videos
  - o Laboratory OSPE (Lab OSPE): This comprises of stations focused on practical (hands on performance) components from core subject areas
  - o Integrated OSPE (I OSPE): This comprises of stations, from each core subject, emphasizing horizontal and vertical integration

o Objective Structured Clinical Examinations (OSCE): This comprises of stations evaluating the ability of students to integrate core knowledge with clinical application

o Objective Structured Viva Examinations (OSVE): This comprises of viva for each core subject.

### **1. End of Module Assessment**

- 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

### **2. End Block Assessment (EBA)**

- This will be applicable to all the blocks of undergraduate program
- 90% attendance in each subject will be mandatory
- There will be no remedial classes for attendance compensation
- There will be no remedial of assessment after poor performance

### Table of Specification (TOS) For Module & Block VII Assessment for 3<sup>rd</sup> Year MBBS

Blue Print of Assessment for 3rd Year MBBS 2026																									
Table of Specification																									
Module Examination Include																									
Written Theory Based Assessment																									
Audio Visual Aid assisted Assessment																									
Modules	Subject	MCQs*	Marks	EMQs*	Marks	SAQs*	Marks	SEQs*	Marks	Core Subject 70%			Horizontal & Vertical Integration 20%			Spiral Integration 10%			Total Marks Theory	Total Time	Av OSPE* C=7,HI=2,SI=1		Time	AED Reflective Writing	Total Time of Module Assessment
										MCQs	EMQs	SAQ/SEQ	MCQs	EMQs	SAQs/SEQs	MCQs	EMQs	SAQs/SEQs			Stations	Marks			
Foundation II	Pharmacology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Pathology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Forensic Medicine	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
Module 2 Examination																									
Modules	Subject	MCQs*	Marks	EMQs*	Marks	SAQs*	Marks	SEQs*	Marks	Core Subject 70%			Horizontal & Vertical Integration 20%			Spiral Integration 10%			Total Marks Theory	Total Time	Av OSPE* C=7,HI=2,SI=1		Time	AED Reflective Writing	Total Time of Module Assessment
										MCQs	EMQs	SAQ/SEQ	MCQs	EMQs	SAQs/SEQs	MCQs	EMQs	SAQs/SEQs			Stations	Marks			
Foundation III	Pharmacology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Pathology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Forensic Medicine	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Behaviour Sciences	40	40	0	0	2	10	0	0	25	0	2	10	0	0	5	0	0	50	1 hour					1 hr
Block Examination Include																									
LMS Based Assessment													Weekly LMS Based Assessment												
Skill lab Assessment(OSPE)													Table of Specification												
Laboratory-Based Assessment													Table of Specification												
OBSERVED & STRUCTURED VIVA EXAMINATION(OSVE)																									

BLOCK	LMS Based Assessment						Lab OSPE*				Time**	OSVE***				Time
	Subjects	MCQs*			Observed	Marks	Unobserved	Marks	Module 1			Module 2				
		F1	F2	F1 & 2					Viva Marks	Copy Marks		Viva Marks	Book Marks			
(BLOCK I)	Pharmacology	15	15	30	10	50	10	50	6 hrs	45	5	45	5	4 hrs		
	Pathology	15	15	30	10	50	10	50	6 hrs	45	5	45	5	4 hrs		
	Forensic Medicine	10	10	20	10	50	10	50	6 hrs	45	5	45	5	4 hrs		
	Behaviour Sciences	5	5	10												
	Medicine	8	7	15												
	Surgery	8	7	15												

Subjects	Pharmacology	Pathology	Forensic Medicine	Behaviour Sciences	Medicine	Surgery	IUGR
No of MCQs*	20	20	20	5	10	10	5
Marks/MCQ	20	20	20	5	10	10	5
Total Marks	90						

\*MCQ=1 Mark each, 1 min each

*MCQ=1 Mark each	*EMQ= 5 Mark each	*SAQ= 5 Mark each	*SEQ= 9 Mark each
**Time=1 Round of 40 Students =80 min			
**Time=3 Round of 40 Students =240 min			
**Time=OSPE of Behaviour Sciences will be taken with Phramacology, Forensic Medicine & Pathology			
***OSVE=Time per student=5mins			

### Table of Specification (TOS) For Module & Block VIII Assessment for 3<sup>rd</sup> Year MBBS

Blue Print of Assessment for 3rd Year MBBS 2026																									
Table of Specification																									
Module Examination Include																									
Written Theory Based Assessment																									
Audio Visual Aid assisted Assessment																									
Modules	Subject	MCQs*	Marks	EMQs*	Marks	SAQs*	Marks	SEQs*	Marks	Core Subject 70%			Horizontal & Vertical Integration 20%			Spiral Integration 10%			Total Marks Theory	Total Time	Av OSPE* C=7,HI=2,SI=1		Time	AED Reflective Writing	Total Time of Module Assessment
										MCQs	EMQs	SAQ/SEQ	MCQs	EMQs	SAQs/SEQs	MCQs	EMQs	SAQs/SEQs			Stations	Marks			
GIT, Parasitology & Hepatobiliary Module-II	Pharmacology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Pathology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Forensic Medicine	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
Module 2 Examination																									
Modules	Subject	MCQs*	Marks	EMQs*	Marks	SAQs*	Marks	SEQs*	Marks	Core Subject 70%			Horizontal & Vertical Integration 20%			Spiral Integration 10%			Total Marks Theory	Total Time	Av OSPE* C=7,HI=2,SI=1		Time	AED Reflective Writing	Total Time of Module Assessment
										MCQs	EMQs	SAQ/SEQ	MCQs	EMQs	SAQs/SEQs	MCQs	EMQs	SAQs/SEQs			Stations	Marks			
Microbes & Antimicrobials	Pharmacology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Pathology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Forensic Medicine	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes
	Behaviour Sciences	40	40	0	0	2	10	0	0	25	0	2	10	0	0	5	0	0	50	1 hour					1 hr
Block Examination Include																									
LMS Based Assessment																									
Skill Lab Assessment(OSPE)																									
Laboratory-Based Assessment																									
OBSERVED & STRUCTURED VIVA EXAMINATION(OSVE)																									
Weekly LMS Based Assessment												Table of Specification													
BLOCK	LMS Based Assessment			Lab OSPE*			OSVE***			Time**	Time														
	Subjects	MCQs*			Observed	Marks	Unobserved	Marks	Module 1		Module 2														
		F1	F2	F1 & 2					Viva Marks	Copy Marks	Viva Marks	Book Marks													
(BLOCK I)	Pharmacology	15	15	30	10	50	10	50	6 hrs	45	5	45	5	4 hrs											
	Pathology	15	15	30	10	50	10	50	6 hrs	45	5	45	5	4 hrs											
	Forensic Medicine	10	10	20	10	50	10	50	6 hrs	45	5	45	5	4 hrs											
	Behaviour Sciences	5	5	10																					
	Medicine	8	7	15																					
	Surgery	8	7	15																					

Subjects	Pharmacology	Pathology	Forensic Medicine	Behaviour Sciences	Medicine	Surgery	IUGR
No of MCQs*	20	20	20	5	10	10	5
Marks/MCQ	20	20	20	5	10	10	5
Total Marks	90						
*MCQ=1 Mark each, 1 min each							

*MCQ=1 Mark each	*EMQ= 5 Mark each	*SAQ= 5 Mark each	*SEQ= 9 Mark each
**Time=1 Round of 40 Students =80 min			
**Time=3 Round of 40 Students =240 min			
**Time=OSPE of Behaviour Sciences will be taken with Pharmacology, Forensic Medicine & Pathology			
***OSVE=Time per student=5mins			

### Table of Specification (TOS) For Module & Block IX Assessment for 3<sup>rd</sup> Year MBBS

Blue Print of Assessment for 3rd Year MBBS 2026																										
Table of Specification																										
Module Examination Include																										
Written Theory Based Assessment																										
Audio Visual Aid assisted Assessment																										
Modules	Subject	MCQs*	Marks	EMQs*	Marks	SAQs*	Marks	SEQs*	Marks	Core Subject 70%			Horizontal & Vertical Integration 20%			Spiral Integration 10%			Total Marks Theory	Total Time	Av OSPE* C=7,HI=2,SI=1		Time	AED Reflective Writing	Total Time of Module Assessment	
										MCQs	EMQs	SAQ/SEQ	MCQs	EMQs	SAQs/SEQs	MCQs	EMQs	SAQs/SEQs			Stations	Marks				
Hematology and Immunology Module II	Pharmacology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes	
	Pathology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes	
	Forensic Medicine	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes	
Module 2 Examination																										
Modules	Subject	MCQs*	Marks	EMQs*	Marks	SAQs*	Marks	SEQs*	Marks	Core Subject 70%			Horizontal & Vertical Integration 20%			Spiral Integration 10%			Total Marks Theory	Total Time	Av OSPE* C=7,HI=2,SI=1		Time	AED Reflective Writing	Total Time of Module Assessment	
										MCQs	EMQs	SAQ/SEQ	MCQs	EMQs	SAQs/SEQs	MCQs	EMQs	SAQs/SEQs			Stations	Marks				
CVS & Respiration Module II	Pharmacology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes	
	Pathology	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes	
	Forensic Medicine	25	25	1	5	5	25	5	45	19	1	7	4	0	2	2	0	1	100	3 HRS	10	50	50 min	45 mins	4 hrs 35 minutes	
	Behaviour Sciences	40	40	0	0	2	10	0	0	25	0	2	10	0	0	5	0	0	50	1 hour					1 hr	
Block Examination Include																										
LMS Based Assessment																										
Skill lab Assessment(OSPE)																										
Laboratory-Based Assessment																										
OBSERVED & STRUCTURED VIVA EXAMINATION(OSVE)																										
BLOCK	LMS Based Assessment										Lab OSPE*				OSVE***				Time							
	Subjects	MCQs*			Observed	Marks	Unobserved	Marks	Module 1		Module 2		Time													
		F1	F2	F1 & 2					Viva Marks	Copy Marks	Viva Marks	Book Marks														
(BLOCK I)	Pharmacology	15	15	30	10	50	10	50	6 hrs	45	5	45	5	4 hrs												
	Pathology	15	15	30	10	50	10	50	6 hrs	45	5	45	5	4 hrs												
	Forensic Medicine	10	10	20	10	50	10	50	6 hrs	45	5	45	5	4 hrs												
	Behaviour Sciences	5	5	10																						
	Medicine	8	7	15																						
	Surgery	8	7	15																						

Subjects	Pharmacology	Pathology	Forensic Medicine	Behaviour Sciences	Medicine	Surgery	IUGR
No of MCQs*	20	20	20	5	10	10	5
Marks/MCQ	20	20	20	5	10	10	5
Total Marks	90						
*MCQ-1 Mark each, 1 min each							

*MCQ-1 Mark each	*EMQ= 5 Mark each	*SAQ= 5 Mark each	*SEQ= 9 Mark each
**Time-1 Round of 40 Students =80 min			
**Time-3 Round of 40 Students =240 min			
**Time-OSPE of Behaviour Sciences will be taken with Phramacology, Forensic Medicine & Pathology			
***OSVE=Time per student=5mins			

## Block wise CIA Calculation of Pharmacology, Pathology, Forensic Medicine & Behavior Sciences

Conceptual Design for the Development of the Assessment Module ( Conventional CIA + LMS ) 2026																								
3rd Year MBBS																								
Basic Subjects (Pharmacology, Pathology, Forensic Medicine & Behaviour Sciences)																								
Block-1 +Block-2 +Block-3 Combined (CIA)																								
Roll No	Name of Student	Pharmacology				Pathology				Forensic Medicine				Behaviour Sciences										
		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus								
		Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical							
		45	45	15	15	120					30	30	10	10	80					15	15	5	5	40
Block-1 Combined (CIA)																								
Roll No	Name of Student	Pharmacology				Pathology				Forensic Medicine				Behaviour Sciences										
		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus								
		Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical							
		15	15	5	5	40	15	15	5	5	40	30	30	3	3	26	5	5	1	1	12			
Block-2 +3 Combined (CIA)																								
Roll No	Name of Student	Pharmacology				Pathology				Forensic Medicine				Behaviour Sciences										
		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus		Assessment + On Campus LMS		LMS Based Summative Assessment Off Campus								
		Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical	Theory	Practical							
		15	15	5	5	40	15	15	5	5	40	30	30	4	4	27	5	5	2	2	14			

Department of Pharmacology/ Pathology							
Module-1							
Roll No	Name of Student	Theory Marks	Practical Marks	Total Marks	Theory CIA	Practical CIA	CIA
		100	50	150	6	4	10

Department of Forensic Medicine							
Module-1							
Roll No	Name of Student	Theory Marks	Practical Marks	Total Marks	Theory CIA	Practical CIA	CIA
		100	50	150	4	2	6

Department of Behaviour Sciences							
Module-1							
Roll No	Name of Student	Theory Marks	Practical Marks	Total Marks	Theory CIA	Practical CIA	CIA
		50	25	75	4	5	9

Department of Pharmacology/ Pathology							
Block Exam							
Roll No	Name of Student	On Campus LMS	Practical Marks	Total Marks	Theory CIA	Practical CIA	CIA
		30	200	230	3	7	10

Department of Forensic Medicine							
Block Exam							
Roll No	Name of Student	On Campus LMS	Practical Marks	Total Marks	Theory CIA	Practical CIA	CIA
		20	200	220	2	6	8

Department of Behaviour Sciences							
Block Exam							
Roll No	Name of Student	On Campus LMS	Practical Marks	Total Marks	Theory CIA	Practical CIA	CIA
		10		10	1		1

Department of Pharmacology/ Pathology							
LMS Based Summative Assessment Off Campus Block I, III & III							
Roll No	Name of Student	Theory Marks LMS Module-I	Practical Marks LMS Module-II	Total Marks	Theory CIA	Practical CIA	CIA
		5	5	10	5	5	10

Department of Forensic Medicine							
LMS Based Summative Assessment Off Campus Block I							
Roll No	Name of Student	Theory Marks LMS Module-I	Practical Marks LMS Module-II	Total Marks	Theory CIA	Practical CIA	CIA
		3	3	6	3	3	6

Department of Forensic Medicine							
LMS Based Summative Assessment Off Campus Block II							
Roll No	Name of Student	Theory Marks LMS Module-I	Practical Marks LMS Module-II	Total Marks	Theory CIA	Practical CIA	CIA
		4	3	7	4	3	7

Department of Forensic Medicine							
LMS Based Summative Assessment Off Campus Block III							
Roll No	Name of Student	Theory Marks LMS Module-I	Practical Marks LMS Module-II	Total Marks	Theory CIA	Practical CIA	CIA
		4	3	7	4	3	7

Behaviour Sciences							
LMS Based Summative Assessment Off Campus Block I							
Roll No	Name of Student	Theory Marks LMS Module-I	Practical Marks LMS Module-II	Total Marks	Theory CIA	Practical CIA	CIA
		1	1	2	1	1	2

Behaviour Sciences							
LMS Based Summative Assessment Off Campus Block II							
Roll No	Name of Student	Theory Marks LMS Module-I	Practical Marks LMS Module-II	Total Marks	Theory CIA	Practical CIA	CIA
		2	2	4	2	2	4

Behaviour Sciences							
LMS Based Summative Assessment Off Campus Block III							
Roll No	Name of Student	Theory Marks LMS Module-I	Practical Marks LMS Module-II	Total Marks	Theory CIA	Practical CIA	CIA
		2	2	4	2	2	4

## ASSESSMENT PLAN OF CLINICAL SUBJECTS

### I. GENERAL SURGERY

Assessment in the Surgery Module is designed according to the **RMU-12 competency-based integrated curriculum**. It evaluates students across the **cognitive, psychomotor, and affective domains** using both formative and summative assessment tools.

The assessment system ensures:

- Continuous monitoring of learning
- Evaluation of clinical competence
- Integration of knowledge and skills
- Alignment with Bloom's taxonomy and Miller's pyramid

Assessment is divided into three major components:

1. **Module Continuous Assessment**
2. **End Block Clinical Examination**
3. **Block Theory Examination**

#### 1. MODULE CONTINUOUS ASSESSMENT

Module continuous assessment evaluates students during the clinical rotation and includes **OSCE and LMS assessments**.

Assessment Tool	Structure	Marks
OSCE	5 Stations	50 Marks
LMS	25 MCQs	25 Marks

**Total Module Continuous Assessment = 75 Marks**

### a. OSCE (Objective Structured Clinical Examination)

Students rotate through **five structured clinical stations** assessing practical competencies.

Station	Skill Assessed	Domains Assessed
Station 1	Focused surgical history taking	Cognitive (C3–C4) Psychomotor (P2–P3) Affective (A2)
Station 2	Clinical examination (breast / thyroid / hernia)	
Station 3	Interpretation of investigations	
Station 4	Procedural skill (scrubbing, suturing, catheterization)	
Station 5	Clinical reasoning / patient counselling	

### b. LMS Assessment

- Conducted online on the Learning Management System
- 25 Single Best Answer MCQs
- Covers module learning objectives

Domains assessed:

Cognitive domain (C1–C3)

## 2. END BLOCK CLINICAL EXAMINATION

At the completion of the surgical block of 10 weeks, students undergo an **integrated clinical examination**.

Assessment Tool	Structure	Marks
AV-OSPE	10 Stations	50 Marks

OSCE	5 Stations	50 Marks
LMS	50 MCQs	50 Marks

**Total End Block Clinical = 150 Marks**

**a. AV-OSPE (Audio Visual Objective Structured Practical Examination)**

AV-OSPE stations assess interpretation and recognition skills using visual material.

Station Type	Example	Domains Assessed
Radiology interpretation	X-ray abdomen, ultrasound	Cognitive (C2–C4)
Clinical photographs	Breast lump, thyroid swelling	
Instrument identification	Surgical instruments	
Specimen identification	Surgical pathology	
Procedure video	Basic surgical techniques	

**b. OSCE (Clinical Skills Examination)**

Students perform clinical tasks in a structured environment.

Station	Competency	Domains Assessed
Station 1	Clinical examination	Cognitive (C3–C4) Psychomotor (P2–P3) Affective (A2)
Station 2	Procedural skill	
Station 3	Communication and counselling	
Station 4	Emergency management	

Station 5	Clinical reasoning	
-----------	--------------------	--

**c. LMS MCQs**

- 50 integrated MCQs
- Case-based questions
- Assess applied clinical knowledge

Domain assessed:  
Cognitive (C2–C4)

**3. BLOCK THEORY EXAMINATION**

The block theory examination evaluates students’ understanding of surgical principles and clinical reasoning.

Assessment Tool	Structure	Marks
MCQs	20	20 Marks
SEQ	3 Questions	15 Marks
LMS	15 MCQs	15 Marks

**Total Block Theory = 50 Marks**

**a. MCQs**

- Single Best Answer format
- Assess core surgical concepts and clinical applications

Domains assessed:  
Cognitive (C1–C3)

**b. SEQs (Structured Essay Questions)**

SEQ questions assess deeper understanding and clinical reasoning.

Example areas tested:

- Surgical site infection
- Fluid management
- Breast carcinoma management
- Hernia complications
- Acute abdomen

Domain assessed:

Cognitive (C3–C4)

### c. LMS Assessment

Online MCQ assessment conducted through LMS.

Domain assessed:

Cognitive (C1–C3)

### TOTAL ASSESSMENT DISTRIBUTION

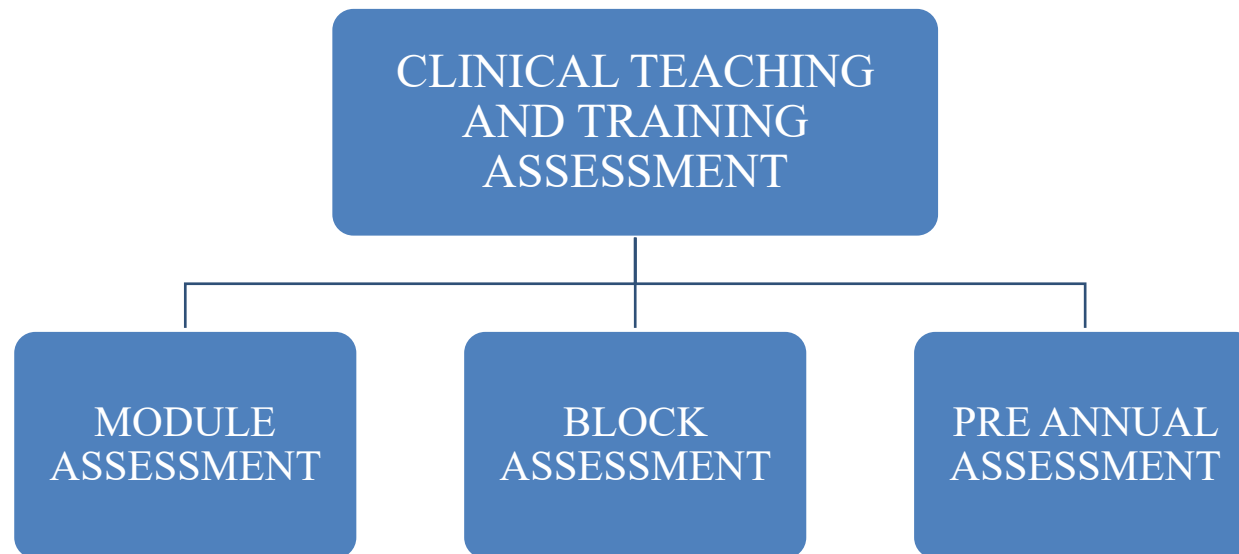
Component	Marks
Module Continuous Assessment	75
End Block Clinical Examination	150
Block Theory Examination	50
<b>GRAND TOTAL</b>	<b>275</b>

## II. GENERAL MEDICINE

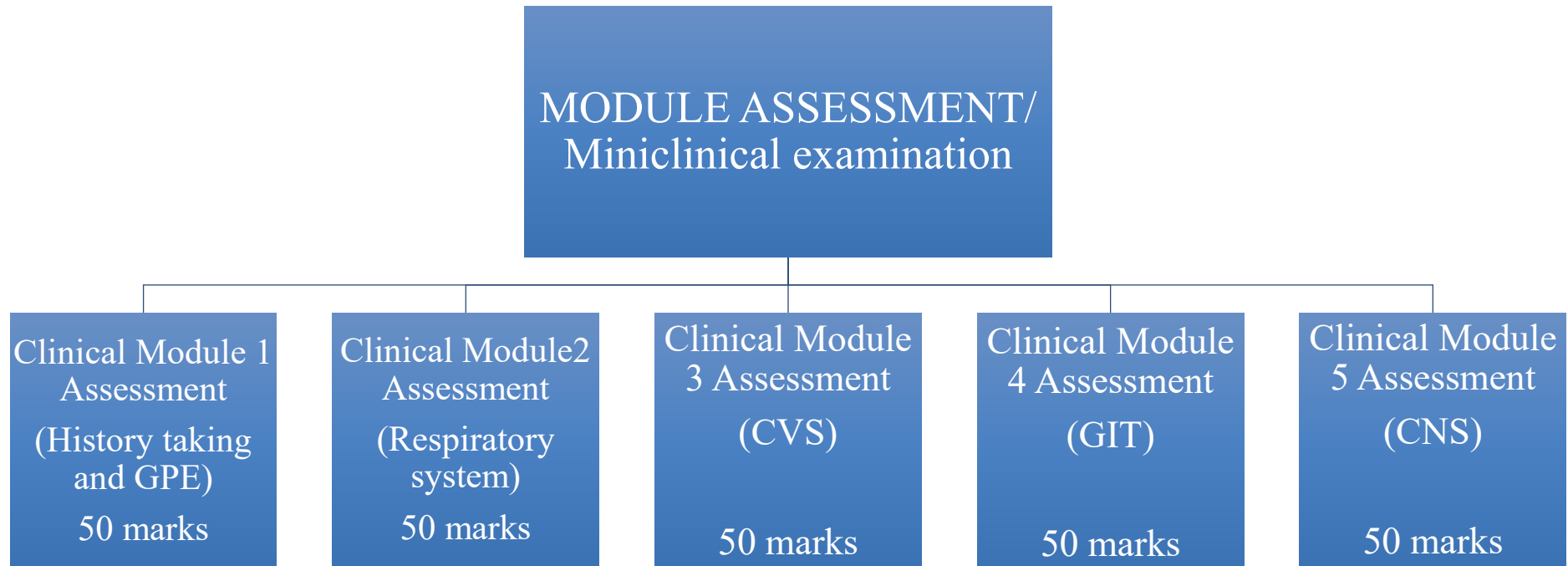
Assessment in the Medicine Module is designed according to the **RMU-12 competency-based integrated curriculum**. It evaluates students across the **cognitive, psychomotor, and affective domains** using both formative and summative assessment tools.

The assessment system ensures:

- Continuous monitoring of learning
- Evaluation of clinical competence
- Integration of knowledge and skills
- Alignment with Bloom's taxonomy and Miller's pyramid



**Assessment Framework of General Medicine**



**AVERAGE MODULE ASSESSMENT= MODULE 1+MODULE 2+MODULE 3+MODULE 4+MODULE 5/5 = 50/5= 10**

## BLOCK ASSESSMENT THIRD YEAR (MEDICINE)

It consists of two components:

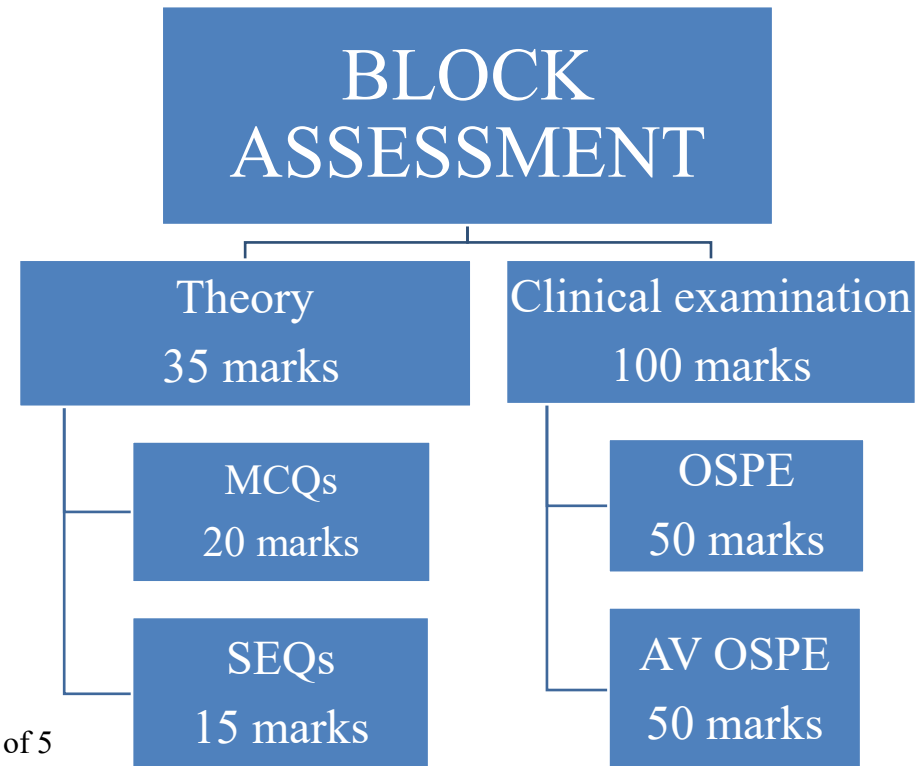
- Written Examination
- Clinical Examination

### Written Examination:

- It will consist of 20 MCQs, 3 SAQs in block theory paper
- Core concept of MCQs will be to assess knowledge of students regarding basic concepts of history taking and clinical examination.

### Clinical Examination:

- It will consist of AV OSPE and clinical OSCE
- There will be 10 stations of audiovisual OSPE, each station will be of 5 marks, total marks 50.
- There will be total 5 stations of clinical OSCE, one station for history taking, 4 stations for examination of all 4 major systems GIT, CVS, CNS and Respiratory system, each station will be of 10 marks, total 50 marks.



Block Exam Stations	Marks Distribution (100 marks)	Time Allocation 1 Hour 15 mins
<b>CLINICAL OSCE</b>	5*10=50 marks	Total time=25 min
• History taking	10	05 mins
• Short case (CVS)	10	05 mins
• Short case (Respiratory)	10	05 mins
• Short case (GIT)	10	05 mins
• Short case (CNS)	10	05 mins
<b>Clinical Video/ Audio/Pictorial OSPE (10)</b>	10(5) = 50 marks	50 mins

**SENDUP/ PRE-ANNUAL EXAM**

PRE-ANNUAL (120 Marks)			
Theory (60 Marks) Knowledge		Clinical OSCE (60 Marks) Psychomotor	
MCQs (60)		Ci-OSCE (6 stations)	
Foundation module 2	10	History taking and GPE	01
Foundation module 3	10	Emergency Medicine	01
Gastrointestinal Module	10	Radiology	01
Infectious disease module	10	CNS/GIT	01
Hematology and Immunology Module	10	Infectious Disease	01
Cardiovascular / Respiratory Module	10	Basic Life Support	01

### III. MEDICINE ALLIED SPECIALITIES

Assessment in the Medicine Allied Specialities is designed according to the **RMU-12 competency-based integrated curriculum**. It evaluates students across the **cognitive, psychomotor, and affective domains** using both formative and summative assessment tools.

The assessment system ensures:

- Continuous monitoring of learning
- Evaluation of clinical competence
- Integration of knowledge and skills
- Alignment with Bloom's taxonomy and Miller's pyramid

Assessment is divided into three major components:

- i. **End Module/Rotation Assessment**
- ii. **End Block Clinical Examination**

#### 1. END MODULE/ROTATION ASSESSMENT

Module assessment evaluates students at the end of two weeks clinical rotation in respective specialty and includes **OSCE and LMS assessments**.

Assessment Tool	Structure	Domain Assessed	Marks
OSCE	5 Stations	Cognitive (C3–C4) Psychomotor (P2–P3) Affective (A2)	50 Marks
LMS	25 MCQs	Cognition (C1–C6)	25 Marks

**2. END BLOCK CLINICAL EXAMINATION**

At the completion of all five allied rotations after 10 weeks, students undergo an **integrated clinical examination**.

Assessment Tool	Structure	Marks	Distribution	Domains Assessed
AV-OSPE	10 Stations (05 marks each)	50 Marks	Gastroenterology (02) Radiology (02) Emergency Medicine (02) Infectious Disease (02) Skill Lab (02)	Cognition (C2-C6)
OSCE	5 Stations (10 Marks each)	50 Marks	Gastroenterology (01) Radiology (01) Emergency Medicine (01) Infectious Disease (01) Skill Lab (01)	Cognitive (C3-C4) Psychomotor (P2-P3) Affective (A2)
LMS	50 MCQs	50 Marks	Gastroenterology (10) Radiology (10) Emergency Medicine (10) Infectious Disease (10) Skill Lab (10)	Cognition (C1-C6)



**Conceptual Design for the Development of the Assessment Module**

**3rd Year MBBS  
MEDICINE/SURGERY**



Continuous Internal Assessment											
Roll No	Name of Student	Medicine (Block -IV)				Surgery (Block -V)					
		On Campus Assessment		LMS Based Assessment		Total	On Campus Assessment		LMS Based Assessment		Total
		Theory	Clinical	Theory	Clinical		Theory	Clinical	Theory	Clinical	
		30	30	10	10	80	30	30	10	10	80

MEDICINE (BLOCK-IV)														
Roll No.	Name of Student	Theory Marks	On Campus Assessment				Theory CIA	Clinical CIA		Total CIA	LMS Based Assessment			
			Clinical Marks (General Medicine)			30		20	10		60	10	10	20
			Clinical Modules (I-V)	Clinical End Block	Total									
			Clinical Marks (Allied)											
		100	250	100	350									
			250	100	350									

SURGERY (BLOCK-V)														
Roll No.	Name of Student	Theory Marks	On Campus Assessment			Theory CIA	Clinical CIA	Total CIA	LMS Based Assessment					
			Clinical Marks						30	30	60	10	10	20
			Clinical Modules (I-V)	Clinical End Block	Total									
		105	250	100	350									

# **SECTION-X**

## **Feedback & Evaluation**

## Feedback & Evaluation

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

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

### How feedback is received

#### ➤ Informal Feedback

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

#### ➤ Formal Feedback

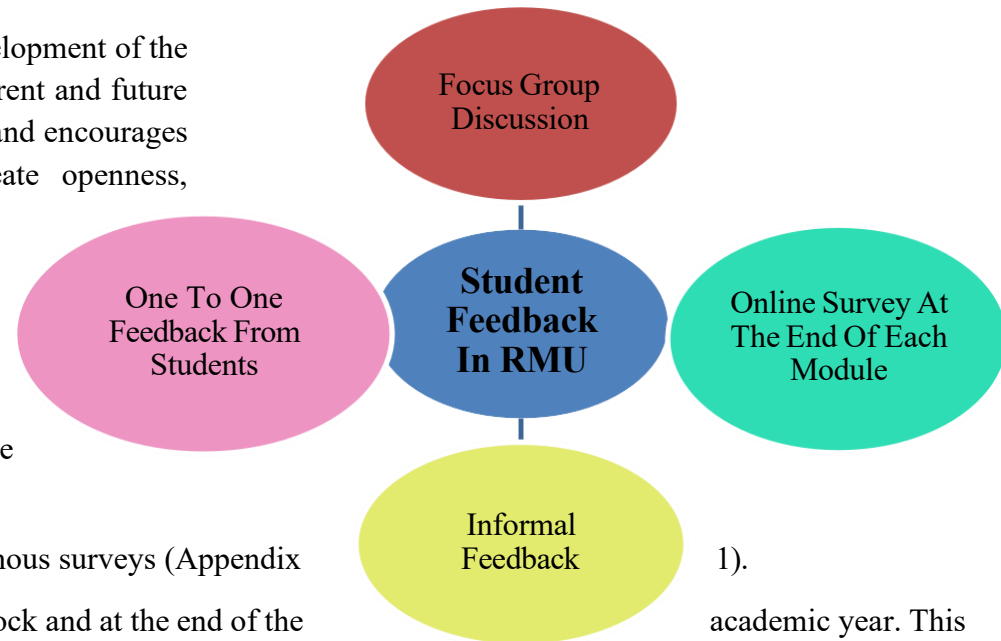
Feedback is received from students in more formal settings. These include:

#### Central survey campaign

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

The central surveys take place after every module, after every Block and at the end of the schedule enables the University to work in conjunction with the students and help to improve the teaching, learning and assessment methodologies. 1).

- **Focus Group Discussion**
- **One To One Feedback from Students**



### Appendix -I Student Feedback Proforma for 2026

(to be conducted after every module completion)

#### Module Content & Organization

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

#### Learning Environment and Teaching Methods

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

### Quality of Delivery

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

### Learning Resources

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

### Student Contribution

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

**Assessments**

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

**LMS and its working**

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

## Swot Analysis of Curriculum

### SOWT Analysis of Implementation of IMC

- **Strength**

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

- **Opportunities**

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

- **Weaknesses**

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

- **Threats**

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

**Summary of Implementation Challenges of IMC**

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

**Recommendations**

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

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

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

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

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

### **Commendations:**

1. Proper, well managed integrated modular curriculum is in place under the vibrant and energetic leadership of Vice Chancellor, Prof. Muhammad Umar and Department of Medical Education. This thing has also been acknowledged by different visits by accreditation bodies like Higher Education Commission (HEC) and Pakistan Medical & Dental Commission.
2. Proper curriculum committee is in place with appropriate representation of the students as members.
3. All stakeholders are on board and are on one page regarding implementation of the integrated modular curriculum.
4. Regular meetings have been done by the curriculum committee.

5. Feedback has been taken regularly with appropriate gap interval in between.
6. Proper record keeping has been done by the Department of Medical Education both in soft and hard form.
7. As far as the assessment is concerned, newly established Examination Department is doing commendable and admirable job.
8. Final results are indicating that both students and faculty have adapted well to integrated modular system and they are satisfied with the system.
9. Campus management system is working efficiently.
10. Standardized format of all teaching strategies has improved the quality of the deliverance of the subject matter.

### **Recommendations:**

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

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

# **Section- XI**

**RMU- Spirally Integrated Courses/ALPHA & GEC Cluster**

## **Integrated University Spiral Courses/ ALPHA & General Education Cluster Module**

### **Preamble**

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

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

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

### **Rationale for the General Education Cluster Module**

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

he rationale behind this integrative approach includes:

1. **Holistic Development:** Medicine is a field that requires not only technical proficiency but also leadership, ethical judgment, and effective communication. By incorporating Leadership, Information Technology, Entrepreneurship, Expository Writing, Art and Humanities, Research and Bioethics, and Quran Translation into the curriculum, the module aims to develop well-rounded professionals who excel in both clinical and non-clinical aspects of healthcare.

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

In essence, this module represents a strategic response to the evolving needs of the healthcare profession, ensuring that medical graduates are not only technically proficient but also capable of leading, innovating, and communicating effectively in a complex and dynamic field.

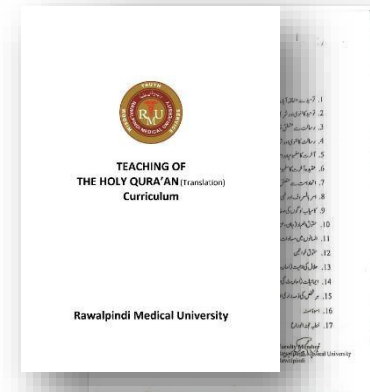
### Alignment of RMU Spiral Courses as per HEC Undergraduate Policy 2023 and guidelines of PMDC 2024

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

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

## Islamiat & The Holy Quran Translation

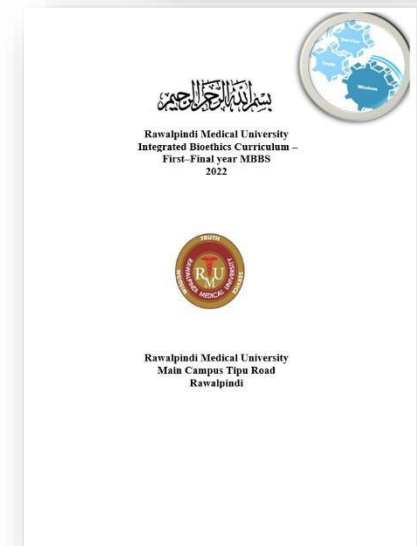
A course of Islamic Studies provides students with a comprehensive overview of the fundamental aspects of Islam, its history, beliefs, practices, and influence on society and familiarize students with a solid foundation in understanding the religion of Islam from an academic and cultural perspective.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



## Bioethics

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

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

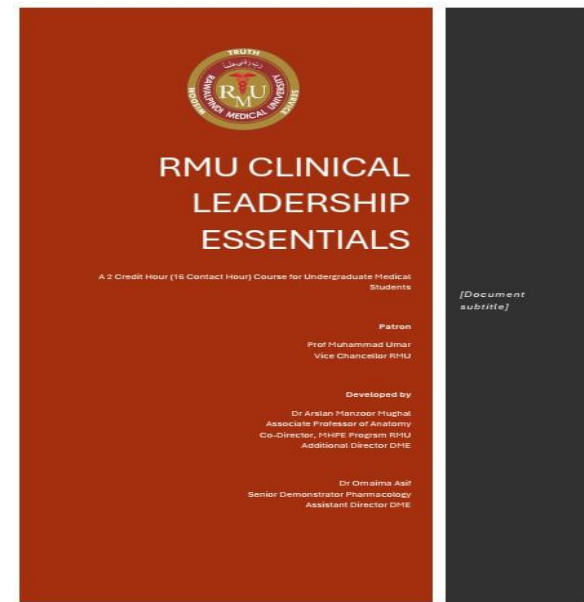


informed consent to end-of-life care and the equitable distribution of healthcare resources.

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

## Leadership & Professionalism

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



care provided to patients and is critical for maintaining trust that is essential for the doctor-patient relationship.

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

## **Communication Skills**

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

At Rawalpindi Medical University (RMU), the development of communication skills is regarded as a fundamental aspect of medical education, recognizing its critical importance in enhancing patient care, teamwork, and interdisciplinary collaboration. RMU is

dedicated to equipping its students with exceptional communication abilities, enabling them to effectively interact with patients, their families, and healthcare colleagues. The curriculum is thoughtfully designed to incorporate various interactive and experiential learning opportunities, such as role-playing, patient interviews, and group discussions, which allow students to practice and refine their communication skills in a supportive environment.

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

### Behavioral Sciences

Behavioral sciences in medicine focus on understanding and addressing the psychological and social aspects of health and illness.

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

MODULAR CURRICULUM OF BEHAVIOURAL SCIENCES FOR FIRST YEAR MBBS

Institute of Psychiatry  
Benazir Bhutto Hospital

Year	LGIS	SDL	CLINICAL ROTATION		Total
1 <sup>st</sup> Year	12 hours	20 hours	No clinical rotation		32 hours
2 <sup>nd</sup> Year	8 hours	20 hours	No clinical rotation		28 hours
3 <sup>rd</sup> Year	12 hours	30 hours	20 hours 8am-10:30am 4 days a week, 2 weeks rotation	28 hours 2pm -6pm 7 days in 2 weeks rotation	90 hours
Total					150 hours

## Family Medicine

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

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

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



Rawalpindi Medical University



## Family Medicine

Undergraduate /Curriculum for MBBS



Prof. Muhammad Umar  
Vice Chancellor  
Rawalpindi Medical University

Dr. Sadia Azam Khan  
HOD Family Medicine  
Rawalpindi Medical University

## Artificial Intelligence

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



Undergraduate Program in Artificial Intelligence  
Rawalpindi Medical University



## Integrated Undergraduate Research Curriculum

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

Rawalpindi Medical University Rawalpindi  
Rawalpindi



Integrated Undergraduate Research  
Curriculum (IUGRC)

through their individual compulsory written feedback (reflection) after the scheduled teachings end.

## Innovation & Entrepreneurship

Entrepreneurship is the process of designing, launching, and running a new business, which typically starts as a small enterprise offering a product, process, or service for sale or hire. It involves identifying a market opportunity, gathering resources, developing a business plan, and managing the business's operations, growth, and development. Entrepreneurship in medical universities represents a burgeoning field where the innovative spirit intersects with healthcare to forge advancements that can transform patient care, medical education, and healthcare delivery. This unique amalgamation of medical expertise and entrepreneurial acumen empowers students, faculty, and alumni to develop groundbreaking medical technologies, healthcare solutions, and startups that address critical challenges in the health sector. By integrating entrepreneurship into the curriculum, Rawalpindi Medical university is not only expanding the traditional scope of medical education but also fostering a culture of innovation and problem-solving. This enables future healthcare professionals to not only excel in clinical skills but also in business strategies, leadership, and innovation management.

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



**RAWALPINDI MEDICAL UNIVERSITY**  
**OFFICE OF RESEARCH INNOVATION**  
**& COMMERCIALIZATION (ORIC)**  
 Ph: +92-51-9290853

30<sup>th</sup> Jan., 2024

No: \_\_\_\_\_/ORIC/RMU/24

Vice Chancellor  
 Rawalpindi Medical University  
 Rawalpindi

Subject: **INNOVATION & ENTREPRENEURSHIP FOR UNDERGRADUATE CURRICULUM**

This initiative seeks to embed a dynamic Innovation and Entrepreneurship module within the undergraduate curriculum. Focused on nurturing a culture of creativity and strategic thinking, the program will empower students with essential skills for today's rapidly evolving business landscape. Emphasizing hands-on experiences, the module will guide students through ideation, prototyping, and business model development. By fostering an entrepreneurial mindset, we aim to equip undergraduates with the tools to identify opportunities, solve real-world problems, and instigate positive change. This transformative addition ensures graduates are not only job-ready but also capable of driving innovation and contributing meaningfully to the global entrepreneurial ecosystem.

I am thankful to Prof Iftikhar Hanif and all Seniors who are supporting this idea.

**Dr Asif Maqsood Butt**  
 Manager I&C  
 ORIC RMU

## Digital Literacy Module

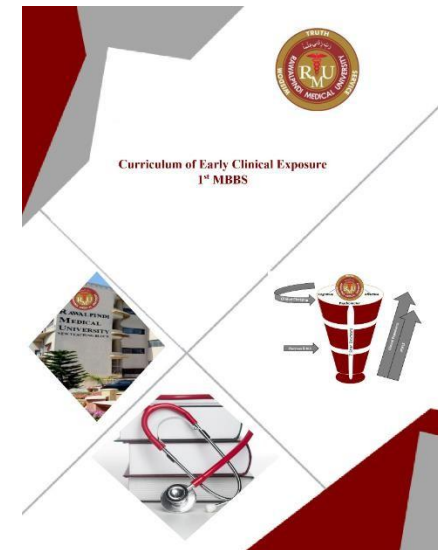
Digital literacy means having the skills one needs to live, learn, and work in a society where communication and access to information is increasing through digital technologies like internet platforms, social media, and mobile devices.



## Early Clinical Exposure (ECE)

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

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

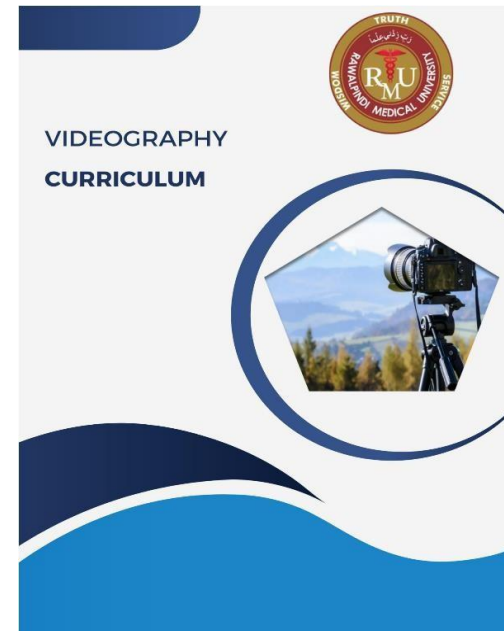


different settings.: Early patient interaction emphasizes the importance of patient-centered care from the outset, underscoring the importance of treating patients as individuals with unique needs and backgrounds. Practical experiences can enhance long-term retention of knowledge as students are able to connect theoretical learning with clinical experiences.: Early clinical experiences often involve working in multidisciplinary teams, which fosters a sense of collaboration and understanding of different roles within healthcare.

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

## **Videography Curriculum**

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



## ALPHA CURRICULUM

*(Artificial Intelligence, Leadership, Professionalism, Humanities, Arts)*

### **Introduction:**

The RMU ALPHA Curriculum at Rawalpindi Medical University represents a transformative approach to medical education, designed to align with the Higher Education Commission Undergraduate Policy 2023 General Educational Cluster. This innovative curriculum integrates a diverse array of general education courses aimed at enhancing the intellectual and professional capabilities of undergraduate medical students. By embedding courses such as Quran Kareem, Introduction to Computer, Functional & Expository Writing, and Leadership Professionalism & Bioethics, the RMU ALPHA Curriculum ensures that students are not only proficient in medical sciences but also excel in critical thinking, ethical leadership, and effective communication. These courses collectively provide a robust foundation that is essential for the holistic development of future medical professionals. Furthermore, the study of Ideology & Constitution of Pakistan instills a deep understanding of national values and legal frameworks, promoting civic responsibility and informed decision-making in medical practice.

By integrating these courses, the RMU ALPHA Curriculum not only adheres to the educational standards set by the Higher Education Commission but also prepares students to navigate the complexities of the medical profession with competence, compassion, and a broad perspective on health and society.

**Aligned with HEC Undergraduate Policy 2023 General Education Cluster**

**Patron**

Prof Muhammad Umar, Vice Chancellor, RMU

**Prepared by:**

Prof Ifra Saeed, Professor of Anatomy

Dr Arsalan Manzoor Mughal, Assoc Prof of Anatomy

S No	Title	Hours Recommended (to Current status in RMU be covered from 1 <sup>st</sup> year Curriculum to 4 <sup>th</sup> Year)	Focal Person	Course development team
			<b>Recommended by HEC &amp; PMDC</b>	
1	Quran Kareem	15 x 4 = 52	Implemented 85 hours	Prof Naeem Akhtar Dr Sidra Hamid Quran Course team
2	Introduction to Computer	7 x 4 = 28	New Course	Mr. Shahid Rasool IT Department
3	Functional & Expository Writing	7 x 4 = 28	New Course	Dr Omaima Asif Literary Society
4	Leadership	7 x 4 = 28	Implemented 50 hours	Prof Akram Randhawa Department of Community Medicine
5	Professionalism & Bioethics	7 x 4 = 28		Dr Khola Noreen Department of Bioethics
6	Arts & Humanities	7 x 4 = 28	New Course	Prof Fuad Khan Dr Saira Arts Society
			<b>Recommended by HEC only</b>	
7	Natural Sciences	<u>Not required as physics, chemistry, biology etc are already part of basic and clinical sciences</u>		
8	Social Sciences	7 x 4 = 28	New course	Ms Ghulam Fatima Ms Vareesha Zafar Psychiatry Department

<b>9</b>	Ideology & Constitution of Pakistan	7 x 4 = 28	Implemented 30 hours	DME Main Campus	Pakistan Studies team
<b>10</b>	Quantitative Reasoning	Already part of Epidemiology and Biostatistics in Community Medicine curriculum			
<b>11</b>	Civics and Community Engagement	Already part of Community Medicine curriculum			
<b>12</b>	Entrepreneurship	7 x 4 = 28	Implemented 32 Awareness Program	Dr Asif	Rawalian Community hours Dr Omaima
	<b>Grand Total Hours</b>	<b>224 hours</b>	<b>Developed and Implemented 197 hours to be developed 112 hours</b>		

## Timetable for General Educational Cluster (GEC) Module 3<sup>rd</sup> Year MBBS (Batch-50)

<b>Third Year MBBS Timetable for General Educational Cluster (GEC) and Social Sciences in Medicine (SSM) Module (First Week)</b>								
<b>10-11-2025 to 15-11-2025</b>								
Date/Day	8:00am-9:10am	9:10am - 10:10am	10:10am - 10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm - 2:00pm	02:00pm - 3:00pm
10-11-2025 Monday	Bioethics	The Holy Quran Translation <b>Imaniat</b>	Break	ICT	Social Sciences	Break	Entrepreneurship	Entrepreneurship SDL Prototype-II
	Ethics of Physician's interaction with Pharmaceutical Industry	Worldly life example; believers see Allah, disbelievers punished. / Examples of Tawheed (Oneness of Allah).		Working with MS Office Tools: Word Processing-I along with AI	Fundamentals of Sociology		Test & Clinical Trials	
	Prof. Dr. Shehzad Manzoor	Molana Qari Abdul Wahid		Mr. Farooq Ahmad Khan	Miss. Kinza Fiaz		Dr. Tehreem	
11-11-2025 Tuesday	8:00 AM - 9:00 AM	9:00 AM - 10:00 AM	10:00 - 11:00AM		11:00AM - 12:00PM		02:00pm - 3:00pm	
	Bioethics	The Holy Quran Translation <b>Imaniat</b>	ICT/AI		Social Sciences		Leadership SDL (Self Assessment) Emotional Management	
	Pharmacovigilance	The objections of the polytheists (mushrikeen) about the Prophethood of the Messenger of Allah, and their answers	Wired and Wireless Networks in Era of AI		Social Determinants of Health			
Prof. Dr. Akram Randhawa	Molana Qari Abdul Wahid	Mr. M Ifkhar		Miss. Kinza Fiaz				
12-11-2025 Wednesday	Social Sciences	The Holy Quran Translation <b>Imaniat</b>	Break	ICT/AI	Expository Writing	Break	Bioethics Club Activity I	Expository Writing SDL Personalized Learning - II
	Discussion Session (Health Inequalities)	Examples of Shirk & events after Judgment Day / Proofs of Allah's Oneness & Prophethood of Muhammad (PBUH)		Basics of Social Networking Enhancement of Social Media Networks Thorough AI	Critical Reading Skills - I		Physicians' interaction with Pharmaceutical Industry, using case scenarios & videos.	
	Miss. Kinza Fiaz	Molana Qari Abdul Wahid		Mr. M Shahzad Shameer	Dr Abdul Hafeez		Dr Lubna MauraJ	
13-11-2025 Thursday	Social Sciences	Videography	Break	ICT/AI	Entrepreneurship	Break	Bioethics Club Activity II	Videography SDL Lighting and Camera Techniques
	Health Behavior and Illness Behavior.	Fundamentals of Videography/Creativity Operation basics		Collaborative Learning with AI	Patent		Workshop Seminar on Medical errors & Pharmacovigilance:	
	Miss. Kinza Fiaz	Miss Humna Asif/Mr Faiq		Mr. M Shahzad Shameer	Dr. Mehwish		Dr Zumera Hakim	
14-11-2025 Friday	The Holy Quran Translation <b>Ibadat</b>	<b>Seerat Mubarik</b>	Break	Leadership	Videography	Break	Bioethics Club (SDL)	Expository Writing SDL Personalized Learning - III
	Amar Bil Maroof Wa Nahi Anil Munkar Dawat e Elahi	The importance of Hadith and Sunnah of the Prophet in religion		Personal Values for Leadership	Manual Camera Settings / Advanced Camera Operations		Ethics of communicable disease, e.g. HIV & public health ethics, using case scenarios/videos.	
	Molana Qari Abdul Wahid	Molana Qari Abdul Wahid		Dr. Arsalan Manzoor Mughal	Miss.Humna Asif/ Mr Faiq			

**Venue: Lecture Hall No. 2, New Teaching Block RMU**

Date/Day	8:00am-9:10am	9:10am - 10:10am	10:10am-10:30am	10:30am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm - 2:00pm	02:00pm - 3:00pm
15-11-2025 Saturday	Seerat Mubarik	The Holy Quran Translation Ibadat	Break	Social Sciences	Leadership	Break	Bioethics	ICT/AI SDL AI in Diagnostics and Disease Prediction
	The Significance of Seerah Studies	Migration, support, and steadfastness /To raise the word of Allah high		The Doctor-Patient Relationship	Team Values for Leadership		Ethics of communicable diseases & public health.	
		Molana Qari Abdul Wahid		Miss. Kinza Fiaz	Dr. Farzana Fatima		Dr Khola Noreen	

*Khola*  
**Dr Khola Noreen**  
 Additional Director DME  
 Rawalpindi Medical University

*Omaira*  
**Dr Omaira Asif**  
 Assistant Director DME  
 Rawalpindi Medical University

**Vice Chancellor**  
 Rawalpindi Medical University

3rd Year CR: *Alms*

GR: *Hajira*

*17/10/21*

*Zunera*  
 16/10/21  
**DR ZUNERA HAKIMI**  
 MBBS MPhil. CHPE. PhD  
 Assoc Prof Pharmacology  
 Rawalpindi Medical University

## CURRICULUM & LEARNING OBJECTIVES OF ALPHA

### Third Year MBBS Video Editing and Post-Production (6 hours)

Sr No.	Topic	Learning Objectives	Teaching Strategy	Assessment Tool
1.	Introduction to Video Editing Software	Familiarize with popular video editing software and their basic functions. Learn how to import, organize, and manage footage within editing software.	LGIS	MCQs
2.	Editing Workflow and Techniques	Develop proficiency in timeline editing, cutting techniques, and adding transitions. Understand the importance of pacing and rhythm in video editing.	LGIS	MCQs
3.	Audio Editing and Integration	Explore techniques for recording and editing audio for video projects. Integrate music, voiceovers, and sound effects to enhance storytelling	LGIS	MCQs
4.	Advanced Editing Techniques	Learn advanced editing techniques such as compositing, visual effects, and motion graphics. Understand how editing choices contribute to narrative structure and emotional impact.	LGIS	MCQs
5.	Color Correction and Grading	Master techniques for color correction and grading to achieve desired visual aesthetics. Apply color theory principles to enhance mood and visual continuity across video projects.	LGIS	MCQs

6.	Video Editing and Sound Design	Edit raw footage into a cohesive narrative using advanced editing techniques. Incorporate sound design elements to enhance the overall impact of the video project.	LGIS	MCQs
----	--------------------------------	--	------	------

## Innovation & Entrepreneurship

### Advanced Projects and Portfolio Development (6 hours)

Sr No.	Topic	Learning Objectives	Teaching Strategy	Assessment Tool
1.	Project Planning and Management	Develop skills in project planning, including budgeting and scheduling.	LGIS	MCQs
		Coordinate production teams and resources effectively for video projects.		
2.	Pitching and Presenting Creative Ideas	Learn how to pitch and present creative concepts effectively.	LGIS	MCQs
		Develop communication skills to articulate and sell ideas to clients or stakeholders		
3.	Portfolio Development	Select and organize work into a professional portfolio.	LGIS	MCQs
		Showcase growth and proficiency in videography through curated projects.		
4.	Career Readiness and Industry Insights	Explore career opportunities in videography and media production.	LGIS	MCQs
		Understand industry trends, standards, and professional expectations.		
5.	Advanced Video	Plan, shoot, edit, and present an advanced video project demonstrating comprehensive skills.	LGIS	MCQs

	Production	Apply all aspects of videography learned throughout the course to produce a polished video.	LGIS	
6.	Portfolio Review and Reflection	Present and discuss portfolio showcasing growth and proficiency in videography.	LGIS	MCQs
		Reflect on personal and professional development throughout the course.		

## LEADERSHIP ESSENTIALS

### Preamble

In the dynamic and multifaceted field of medicine, effective leadership is crucial to providing high-quality patient care, fostering collaborative environments, and driving innovation in healthcare systems. Recognizing the pivotal role that leadership plays in the medical profession, this curriculum aims to equip undergraduate medical students with the knowledge, skills, and attitudes necessary to become proficient leaders.

This curriculum is meticulously designed to address the unique challenges and opportunities that future medical leaders will encounter. It integrates evidence-based theories and practical applications of leadership, drawing from a wealth of resources including seminal books, scholarly articles, and established workshop frameworks. The goal is to create a holistic and immersive learning experience that empowers students to lead with confidence, integrity, and empathy.

### Needs Assessment

The following literature was studied for development of this section. Key points from each literature resource are described below,

1. **Book- ABC of Clinical Leadership by Tim Swanwick**  
Chapter 2-Ledership and Management, Chapter 3-Ledership theories and concepts and Chapter 4- Leading Groups and teams,
2. **Book- Leadership in Healthcare by Carson Dye**  
Part II- Personal Values for leadership (Respect, ethics. Interpersonal connection, desire for change, commitment, emotional intelligence) and Part III- Team Values for Leadership (Cooperation & sharing, cohesiveness & Collaboration, trust and conflict management)
3. **American Medical Association- Team Meetings Strengthen Relationships and Increase Productivity** (<https://edhub.ama-assn.org/steps-forward/module/2702508>) Can be used for creating a section of team meetings for prereading
4. **AAMC MedEdPortal- Leadership and Academic Medicine: Preparing Medical Students and Residents to**

**Be Effective Leaders for the 21st Century** ([https://www.mededportal.org/doi/10.15766/mep\\_2374-8265.10677](https://www.mededportal.org/doi/10.15766/mep_2374-8265.10677))

They designed leadership workshops for students and residents with the following objectives

- 1) introduced to leadership terms and theories
- 2) provided examples of leadership opportunities during medical training and upon entering medical practice
- 3) given instruction and resources on how to become more effective leaders

## **Goals and Objectives**

The primary objectives of this curriculum are to:

### **Cultivate a Deep Understanding of Leadership Principles:**

- Distinguish between management and leadership.
- Explore various leadership theories and concepts.
- Examine the dynamics of leading groups and teams.

### **Foster Self-Awareness and Personal Growth:**

- Encourage introspection and self-assessment to understand individual leadership styles and strengths.
- Promote continuous reflection and improvement of leadership skills.

### **Instill Core Leadership Values:**

- Emphasize the importance of personal values such as respect, ethics, interpersonal connection, desire for change, commitment, and emotional intelligence.
- Highlight team values including cooperation, sharing, cohesiveness, collaboration, trust, and conflict management.

### **Develop Practical Leadership Skills:**

- Provide practical tools and strategies for effective leadership in clinical settings.
- Engage students in interactive workshops and case-based scenarios to apply leadership concepts in real-world situations.

## **Educational Strategies**

Strategies used for teaching will include

### **Interactive Lectures:**

Engaging lectures introduce key leadership concepts and theories, incorporating multimedia elements, real-life examples, and interactive questioning to maintain interest and participation. This approach provides foundational knowledge while encouraging active involvement and critical thinking.

### **Guest Lectures:**

Experienced healthcare leaders are invited to share their insights and experiences through guest lectures and panel discussions, allowing students to engage in dialogue and gain real world perspectives from established leaders in the field.

**Self-Assessments:**

Utilizing tools like leadership style assessments and emotional intelligence evaluations helps students identify their strengths and areas for improvement, encouraging self-assessment and providing constructive feedback to guide personal leadership development.

**Reflective Journaling:**

Students keep reflective journals to document their experiences, challenges, and growth as leaders, guided by prompts to reflect on specific leadership experiences. This practice promotes self-awareness and continuous personal development through structured reflection.

**Group Projects:**

Assigning group projects that require collaboration, delegation, and collective decision-making, students work on initiatives ranging from research to community health campaigns. This strategy enhances teamwork, communication, and project management skills in a leadership context.

**Implementation for 3<sup>rd</sup> Year MBBS:**

**Focus:** Practical Application and Team Dynamics

**Health Education Workshop Leader (2 Hours)**

Assign students to develop and conduct health education workshops for the community.

**Group Projects (2 Hours)**

Initiate group projects that require collaboration, such as community health campaigns, to enhance teamwork and leadership.

**Reflective Journaling:**

Continue reflective journaling, emphasizing reflections on leadership roles within group projects

## **INFORMATION & COMMUNICATION TECHNOLOGY ESSENTIALS**

This course is designed for medical students to improve their skills in ICT (Information and Communications Technology) enabling them to manage their tasks effectively and efficiently in their working environment. Students, in this course, will learn the fundamentals of computing including computer basics and organization, common tools and applications, medical informatics, distance learning, and telemedicine. Students will be provided with knowledge and skills for the use of computing and communication technologies to solve real-life problems.

## Goals and Objectives

This course is intended to give an overview of the complete program of studies in computing and its structure where students will be able to achieve the following objectives:

- Explain the basics of computer organization including memory and storage elements
- Recognize data representation in terms of number systems.
- Understanding basic concepts of the internet, WWW, and internet applications.
- Working on productivity software including Word processing, Spreadsheets, Presentations, and SPSS.
- Use of Microsoft Collaborative software such as MS Teams, MS Outlook, and MS OneDrive.
- Students will learn the basic concepts of networking, network structure, and webmail applications.
- Discovering the latest research in the medical field through social networking platforms such as ResearchGate.

## Educational Strategies

Strategies used for teaching will include:

### Flipped Classroom

Flipping the classroom is a strategy where students first explore course content outside of class by viewing a pre-recorded lecture video or digital module or completing a reading or preparatory assignment. In-class time is organized around student engagement, inquiry, and assessment, allowing students to grapple with, apply, and elaborate on course concepts. In class sessions typically entail collaborative coursework and the use of active learning strategies, including case studies, problem sets, or structured discussions.

**Hands-on Exploration:** Provide opportunities for students to explore and interact with technology through practical activities and projects on software/hardware tools. This allows for experiential learning and fosters a deeper understanding. This activity is conducted in a Lab Environment.

### Project-Based Learning

In project-based learning, students work together, use technology, and develop their problem-solving abilities to devise a solution to the issue at hand. Students are more engaged and learn better with project-based learning. It allows students to use technology.

Additionally, project-based learning links students with local communities and the outside world. Project based learning involves:

- Picking up an idea or problem you have and building that idea or the solution to that problem either alone or in collaboration with others.
- Deciding on the tools to use to execute that project.
- Building projects based on the extent of your creativity, environment, and experience.

**Collaborative Learning:** Encourage collaboration and teamwork when using technology. This can be achieved through group projects, discussions, and peer-to-peer learning, fostering communication and problem-solving skills. Troubleshooting issues in Hardware/Software using this technique will help students to learn from their peers

**Problem-Based Learning (PBL):** is a teaching method in which complex real-world problems are used as the vehicle to promote student learning of concepts and principles as opposed to direct presentation of facts and concepts. In addition to course content, PBL can promote the development of critical thinking skills, problem-solving abilities, and communication skills. It can also provide opportunities for working in groups, finding and evaluating research materials, and life-long learning.

### **Course Reference Material & Literature**

The following literature was studied for the development of this section. Key points from each literature resource are described below,

1. **Book: Introduction to Computers 6th International Edition, Peter, N. McGraw-Hill**

Chapter 1: Lesson 1A Exploring Computer

and their Uses Chapter 1: Lesson 1B

Looking Inside the Computer System

Chapter 5: Lesson 5A Types of Storage  
Devices

Chapter 7: Lesson 7A Networking Basics

Chapter 8: Lesson 8A The Internet and the

World Wide Web Chapter 8: Lesson 8B

Email and Other Internet Services Chapter

10: Lesson 10A Productivity Software's

Chapter 13: Lesson 13A Understanding the need for security Measures

2. **Using Information Technology: A Practical Introduction to Computer & Communications, 6th Edition. Williams, S. McGraw-Hills.**

Chapter 5: Networking and

Communication Chapter 6: The

Internet and the World Wide

Web

Chapter 8: FILES, DATABASES, & E-COMMERCE: Digital Engines for the New Economy

3. **Book: Computers, Communications & Information: A user's introduction, Sarah E. Hutchinson. Stacey, C. Swayer.**

Chapter 3: Input/Output Hardware: Interfaces between you and Computer

Chapter 14: Ethics, Privacy, Security and Social Questions: Computing for Right Living

4. **Book: Computing Fundamentals, Faithe Wempen, Cybex, 2015**

Part II: Chapter 4: Software

Part III: Microsoft Office: Chapter 8: Understanding

Microsoft Office 2013 Part III: Microsoft Office: Chapter 9:

Word Processing with Microsoft Word

Part IV: Connectivity and Communication Chapter 13: Networking, Internet Basics

Part III: Microsoft Office: Chapter 10: Creating Spreadsheets with

Microsoft Excel Part III: Microsoft Office: Chapter 12: Creating

Presentation Graphics with

PowerPoint. Part IV: Connectivity and Communication: Chapter 14: Online Communication

5. **Book: Discovering Computers by Shelly 2016**

Chapter 5: Digital Security, Ethics and Privacy: Threats,  
Issues and Defenses Chapter 6: Creating, formatting, and  
Editing a Word Document

6. **Book: Computer Fundamentals by Pradeep K. Sinha, Priti Sinha 6th Ed**

Chapter 2: Basic

Computer

Organization Chapter

7: Processor And

Memory Chapter 8:

Secondary Storage

Devices Chapter 9:

Input Output Devices

Chapter 10:

Computer Software

Chapter 13: System Implementation

and Operation Chapter 15:

Application Software Packages

7. **Introductory Statistics for Health and Nursing Using SPSS, FIRST EDITION, Louise Marston -  
University College London, UK.**

Chapter 1 Getting Started

with Data and SPSS Chapter

2 Data Management

Chapter 3

Study  
Designs  
Chapter 4  
Probability  
Chapter 5 Summary Statistics  
for Continuous Data Chapter 6  
Summary Statistics for  
Categorical Data Chapter 7  
Samples and Populations  
Chapter 8 Comparing Two  
Categorical Variables Chapter 9  
Comparing Means  
Chapter 10 Non-Parametric Tests  
Chapter 11 Assessing Associations with A  
Continuous Outcome Chapter 12 Assessing  
Associations with A Categorical Outcome

8. **Data and Computer Communications, 10th Edition by William Stallings** Chapter 18 Wireless Networks
9. **Social media in Clinical Practice, <https://link.springer.com/book/10.1007/978-14471-4306-2>**

### **Implementation for 3rd Year Medical Students:**

**Focus:** Working with Presentations, Concepts of Networking, SPSS, and Collaborative Software.

#### **Interactive Lectures:**

- Develop simple MS PowerPoint Document (Create, Edit, and Save Document)
- Formatting with Microsoft PowerPoint
- Enhancing the presentation appearance
- Basics of Networking
- Security, privacy, and ethics

#### **Group Based Learning:**

Create a PowerPoint presentation on recent medical research Add necessary animations and graphics for illustration

#### **Flipped Learning:**

Discussion on different computer crimes and viruses based on shared reference material

**Problem-based Learning:**

Adding video and audio in PowerPoint presentation of the opening ceremony of any event.

**Assessments**

Online MCQ-based LMS Assessments, Assignments will be taken in the first block

**Evaluation**

The program will be evaluated each year by the curriculum committee based on student feedback.

## **ARTIFICIAL INTELLIGENCE**

**Background:**

The Rawalpindi Medical University (RMU) has taken the initiative and lead by starting a program in Artificial Intelligence at the graduate level to help establish and grow the industry in medicine field in Pakistan.

**Program Educational Objectives:**

PEO1: Have a strong competence in Artificial Intelligence resulting in successful careers.

PEO2: Pursuing research and innovation and be able to provide modern solutions to technical problems.

PEO3: To apply as well as create Artificial Intelligence based knowledge at par with the developments at both national and international level.

**Curriculum:**

The proposed curriculum is unified for all RMU partner universities. For the sake of uniformity and ease of transfer of courses, a national course code has also been defined for each course. This will be treated as a reference for course compatibility between RMU partner institutions.

## THE HOLY QURAN TEACHINGS

القرآن بمعہ ترجمہ براہمے جماعت ایم بی بی ایس سال اول تا پنجم											
کل لیکچرز	معا رشت		معاملات		اخلاقیات		عبادات		ایمانیات		سال سوئم
	لیکچر	فیصد	لیکچر	فیصد	لیکچر	فیصد	لیکچر	فیصد	لیکچر	فیصد	
17	2	12	3	18	4	24	4	24	4	24	سال سوئم

### سال سوئم ایمانیات

### عبادات

### اخلاقیات

### معاملات

### معاشرت

لیکچر  
نمبر

- 1 قدرت الہی کا کرشمہ
- 2 مسئلہ توحید پر ایک مکمل خطبہ
- 3 رسول اللہ ﷺ خاتم النبیین
- 4 دوبارہ زندہ ہونے کی عقلی دلیل
- 5 ذکر و فکر
- 6 تلاوت قرآن
- 7 تقویٰ
- 8 اللہ اور رسول ﷺ کی محبت
- 9 تکبر و غرور
- 10 تواضع و انکساری
- 11 علم / تعلیم و تعلم
- 12 جہالت
- 13 ظلم
- 14 عدل و انصاف
- 15 امانت کی ادائیگی
- 16 چوری اور ڈکیتی
- 17 قسم اور کفارہ قسم