

**RYK Medical College**

Department of Medical Education



**Study Guide**

**Module 7: Renal - 1 (Block 4)**

**Academic Year 2025-26**

**(4 Weeks & 3 Days)**

**Integrated and Modular Curriculum**

**Second Year M.B.B.S**

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**LIST OF ABBREVIATIONS**

|  |  |  |  |
| --- | --- | --- | --- |
| A | Anatomy | **HCL** | Hydrochloric acid |
| ABG | Arterial blood gas | **H&E** | Hematoxylin and eosin |
| Ag | Aging | **HL** | Hematopoietic and lymphatic |
| AKI | Acute kidney injury | **HMP** | Hexose monophosphate |
| ALT | Alanine transaminase | **HNSS** | Head & neck special senses |
| AMP | Adenosine Monophosphate | **ICF** | Intra cellular fluid |
| ANS | Autonomic nervous system | **IL** | Interleukin |
| AST | Aspartate transaminase | **IN** | Inflammation |
| AV | Atrioventricular | **INR** | International normalized ratio |
| B | Biochemistry | **IUD** | Intrauterine device |
| Bhs | Behavioral sciences | **IUGR** | Intra uterine growth restriction |
| C | Civics | **JVP** | Jugular venous pressure |
| CBC | Complete blood count | **LDH** | Lactate dehydrogenase |
| C-FRC | Clinical-Foundation Rotation Clerkship | **M** | Medicine |
| CK | Creatine kinase | **MALT** | Mucosa associated lymphoid tissue |
| CM | Community medicine | **MCH** | Mean corpuscular hematocrit |
| CNS | Central nervous system | **MCV** | Mean corpuscular volume |
| CO | Carbon monoxide | **MRI** | Magnetic resonance imaging |
| CO2 | Carbon dioxide | **MS** | Musculoskeletal |
| COPD | Chronic obstructive pulmonary disease | **MSD** | Musculoskeletal disorders |
| COX | Cyclooxygenase | **NEAA** | Non essential amino acids |
| CPR | Cardio pulmonary resuscitation | **NMJ** | Neuromuscular junction |
| CT | Computed tomography | **NS** | neurosciences |
| CV | Cardiovascular | **O** | Ophthalmology |
| CVA | Cerebral vascular accident | **Or** | Orientation |
| DALY | Disability adjusted life year | **P** | Physiology |
| DCMLS | Dorsal column medial lemniscus system | **Pa** | Pathology |
| DLC | Differential leukocyte count | **PAF** | Platelet activating factor |
| DNA | Deoxy ribonucleic acid | **PBL** | Problem based learning |
| ECF | Extra cellular fluid | **PCR** | Polymerase chain reaction |
| ECG | Electrocardiography | **PDGF** | Platelet derived growth factor |
| ECP | Emergency contraceptive pill | **Pe** | Pediatrics |
| EEG | Electroencephalogram | **PEM** | Protein energy malnutrition |
| EnR | Endocrinology and reproduction | **PERLs** | Professionalism Ethics Research Leadership |
| ENT | Ear Nose Throat | **PH** | Pharmacology |
| ER | Emergency room | **PNS** | Peripheral nervous system |
| F | Foundation | **Psy** | Psychiatry |
| FEV1 | Forced expiratory volume 1 | **PVC** | Premature ventricular contraction |
| FM | Forensic medicine | **QALY** | Quality adjusted life years |
| FVC | Forced vital capacity | **QI** | Quran & Islamiat |
| GFR | Glomerular filtration rate | **R** | Renal |
| GIT | Gastrointestinal tract | **Ra** | Radiology |
| GMP | Guanosine monophosphate | **RBCs** | Red blood cells |
| GO | Gynecology and obstetrics | **SA** | Sinoatrial |
| RDA | Recommended dietary allowance | **TCA** | Tricarboxylic acid cycle |
| Re | Respiratory | **TNA** | Tumor necrosis factor |
| RFLP | Restriction fragment length polymorphism | **USG** | Ultrasonography |
| RMP | Resting membrane potential | **UTI** | Urinary tract infection |
| RNA | Ribonucleic acid | **WBCs** | White blood cells |
| S | Surgery |  |  |
| GTO | Golgi tendon organ |  |  |

**CURRICULUM FRAME WORK FOR 2nd YEAR M.B.B.S**

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| **Curriculum framework** |
| **Year 01** | **Modules** | **Block 1** | **Block 2** | **Block 3** |
| * Foundation -1
* Hematopoietic & Lymphatic
 | * Musculoskeletal and locomotion - 1
 | * Cardiovascular-1
* Respiratory - 1
 |
| PERLS-1, Quran-1, Islamiat, Civics, Pakistan Studies, English |
| C-FRC -1(Clinical-Foundation, Rotation, Clerkship) |
|  |
| **Year 02** | **Modules** | **Block 4** | **Block 5** | **Block 6** |
| * GIT & Nutrition–1
* Renal – 1
 | * Endocrinology & Reproduction – 1
* Head & Neck, Special senses
 | * Neurosciences – 1
* Inflammation - 1
 |
| PERLS-2, Quran Pak-2, Islamiat, Civics, Pakistan Studies, English |
| C-FRC -2(Clinical-Foundation, Rotation, Clerkship) |
|  |
| **Year 03** | **Modules** | **Block 7** | **Block 8** | **Block 9** |
| * Foundation – 2
* Infectious Diseases
* Neoplasia
* Musculoskeletal & Locomotion - 2
 | * Hematopoietic, Immunity & Transplant
* Cardiovascular - 2
 | * Respiratory – 2
* Forensic Medicine
* Community Medicine & Family Health - 1
 |
| PERLS - 3, Quran Pak – 3 |
| C-FRC -3 (Clinical-Foundation, Rotation, Clerkship) |
|  |  |  |
| **Year 04** | **Modules** | **Block 10** | **Block 11** | **Block 12** |
| * Renal – 2
* Endocrinology & Reproduction – 2
* GIT & Nutrition –2
* Neurosciences - 2
 | * Maternal & Child Health
* Ophthalmology
* Otorhinolaryngology
 | * Community Medicine & Family Health - 2
* Psychiatry & Behavioral Sciences
 |
| PERLS – 4, Quran Pak – 4, Electives & BLS Workshops |
| C-FRC - 4 (Clinical-Foundation, Rotation, Clerkship) |
|  |
| **Year 05** | **Modules** | * Gynecology & Obstetrics
* Pediatrics
* Medicine & Allied
* Surgery & Allied
 |
| C-FRC -5 (Clinical-Foundation, Rotation, Clerkship) |

**INTRODUCTION TO STUDY GUIDE**

**WHAT IS A STUDY GUIDE?**

This study guide is prepared for the students of 2ns year MBBS (RYKMC) for the session 2025-26 affiliated with University of Health Sciences Lahore (UHS). The learners (2nd year MBBS students) will be able to:-

* Organize the learning program module for the session 2025-26.
* Manage their studies as per guidance provided throughout the module.
* Learn the assessment tools, rules & regulations governing the module.

**THE STUDY GUIDE:**

* Communicates information on organization and management of the module. This will help the student to contact the right person in case of any difficulty.
* Defines the objectives which are expected to be achieved at the end of the module.
* Identifies the learning strategies such as lectures, small group teachings, clinical skills, demonstration, tutorial and case based learning that will be implemented to achieve the module objectives.
* Provides a list of learning resources such as books, computer assisted learning programs, web- links, and journals for students to consult in order to maximize their learning.
* Highlights information on the contribution of continuous and Term examinations on the student’s overall performance.
* Includes information on the assessment methods that will be held to determine every student’s achievement of objectives.
* Focuses on information pertaining to examination policy, rules and regulations.

**MODULE INTRODUCTION**

**Module/ course Name:** Module 7, Block 4, Renal - 1

**Block duration:** 10 weeks & 1 Day (GIT & Nutrition-1 = 5 weeks & 3 days) (Renal-1 = 4 weeks & 3 days)

**Module duration**: 04 weeks & 3 days

**Year:** 2nd Year MBBS

**Start Date:** ---/---/2026

**End Date:** ---/---/2026

**Departments** = Anatomy, Physiology, Biochemistry, pharmacology, pathology, community medicine, clinical skill foundation (hospital), medicine, surgery, gynecology & obstetrics, pediatrics, behavioral sciences, Quran/Islamiat & Pakistan studies.

**Daily timings:** 8:00 AM to 4:00 PM

**No. of hours:** 8 hours per day (20 min tea break & 40 min prayer/lunch break)

**Teaching hours:** 07 per day/35 hours per week

**Test dates: ---/---/2026, ---/---/2026, ---/---/2026**

**End module MCQ exam:**  ---/---/2026 (Theory), ---/---/2026 (OSPE, OSCE, OSVE etc)

**Interactive/ active learning session details**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Subjects** | **TBL** | **PBL** | **CBL** | **SGD** | **Tutorial** | **Demo/Diss** |
| **Anatomy** | × | × | × | × | 1 | 1+1 |
| **Physiology** | 1 | × | × | 1 | × | × |
| **Biochemistry** | × | 2 | × | × | × | × |
| **Surgery** | × | × | 1 | × | × | × |
| **Pathology** | × | × | × | × | × | × |
| **Medicine** | × | 1 | × | × | × | × |
| **Pediatrics** | × | × | × | × | × | × |

**Module themes**

 Kidney

 Ureter

 Bladder

 Acid/base balance

**Clinical relevance**

 Protein in urine.

 Kidney stones.

 Kidney pain.

 Blood in urine (hematuria)

 Kidney infection.& Acute kidney injury (AKI)

 Kidney cancer.

 Dialysis

 Control of blood pressure

**YEAR 2 & MODULE COMMITTEES**

**Year 2 committee**

* Prof Dr Tariq M Rehan (HOD DME) (Principal)
* Prof Dr Tehseen Iqbal (HOD Physiology) (Vice. Principal)
* Prof Dr Ghaffar Ansari (HOD Anatomy), Prof Dr Zia ur Rehman Alvi
* Prof Dr Dr Shafqat Nazeer (HOD Biochemistry)
* Prof Dr Abdul Hakeem (HOD Pathology)
* Prof Dr M Amir Rafique (HOD Pharmacology)
* Prof Dr Javed Akhter (HOD Community Medicine)
* Prof Dr M saleem (HOD Forensic medicine)

**Module committee**

* Dr Raja Faisal Zulfiqar (Anatomy)
* Dr Rahil Adil (Physiology)
* Dr khalida anwar (Biochemistry)
* Dr Naqeeb (Pathology)
* Dr Ali Hussain (community medicine)

**PBL, TBL & CBL Committee**

* Prof Dr Tariq M Rehan (HOD DME) (Principal)
* Prof Dr Tehseen Iqbal (HOD Physiology) (Vice. Principal)
* Prof Dr Ghaffar Ansari (HOD Anatomy), Prof Dr Zia ur Rehman Alvi
* Prof Dr Dr Shafqat Nazeer (HOD Biochemistry

**Mentoring committee**

* Prof Dr Abdul Hakeem (HOD Pathology)
* Prof Dr Abdul Ghaffar Ansari (HOD Anatomy)
* Prof Dr M Amir Rafique (HOD Pharmacology)
* Prof Dr Javed Akhter (HOD Community Medicine)
* Prof Dr M saleem (HOD Forensic medicine)

**Module coordinator:**

* Anatomy: Prof Dr Zia Ur Rehman Alvi
* Biochemistry: Dr Dost M kalhoro
* Physiology: Dr Sadia Javiad
* Pharmacology: Dr Tesneem Yasmin
* Pathology: Dr Syed Naqeeb
* Community medicine: Dr Ali Hussain
* Medicine: Dr Abdul Waheed
* Surgery: Dr Jahangeer
* Pediatrics: Dr Masood
* Gynecology & obstetrics: Dr Farhat Yasmeen
* Behavioral sciences: Dr Mehwish Adnan

**Planning committee:** Department of medical education.

**TEACHING FACULTY**

* Anatomy: Prof Dr Ghaffar Ansari, Prof Dr Zia ur Rehman Alvi, Dr Raja Faisal
* Biochemistry: Dr Khalida Anwar, Dr Dost M kalhoro
* Physiology: Prof Dr Tehseen Iqbal, Dr Rahila Adil, Dr Sadia
* Pharmacology: Dr M Amir Rafique
* Pathology: Prof Dr Abdul Hakeem, Dr Syed Naqeeb Ali
* Community Medicine: Dr Ali Hussain,
* Medicine: Dr Abdul waheed
* Surgery: Dr Jahangeer
* Pediatrics: Dr Masood
* Gynecology & Obstetrics: Dr Farhat Yasmeen
* Behavioral Sciences: Dr Mahwish Adnan
* Holy Quran & Islamiyat: Mr Jaffar
* Pakistan studies: Mr Jaffar
* Civics: Dr Majid

**TEACHING METHODOLOGIES/STRATEGIES**

* Large group interactive sessions
* Tutorials
* Demonstrations
* Lab practical
* Simulations
* Team based learning
* Case based learning
* Problem based learning
* Small group discussions
* Clinical skills foundation

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| **VENUE: GIT & Nutrition -1 module** |
| **GROUPING** | **LECTURES** | **PBL/CBL** | **SMALL GROUP DISCUSSION** |
| **Group A** (1-33)**Group B** (34-66)**Group C** 67-100) | Anatomy → LH - 05Physiology → LH - 02Biochemistry → LH - 01Pathology → LH 04Pharmacology → LH 03Com medicine → LH 03Rest of all → LH 02 | Anatomy → DR - 05Physio → DR - 02Biochem → DR - 01Patho → DR 04Pharma → DR 03Com med → DR 06 | SGD room2nd floor |
| **TEAM BASED LEARNING** |
| * Multi - purpose hall
* Skill lab
* Corresponding lab
 |
| **(PRACTICALS)** |
| Corresponding labs |

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| **(Week 1) Block 4 , Module 7: Renal 1: / /2025-26 to / /2025-26** |
| **Days** | **8:00 am****9:00 am** | **9:00 am****10:00 am** | **10:00****10:20 am** | **10:20 am****11:20 am** | **11:20 am****12:20 pm** | **12:20 pm****01:20 pm** | **01:20****02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **Anatomy** (E&PND)Dr G.Ansari R-A-008 (a)  | **Biochemistry**Dr Shafqat.NR-B-001 | **Tea break** | **Anatomy(G)**Dr ZR.AlviR-A-001 (a) | **Physiology**Dr Tehseen.IR-P-001 (a) | **Anatomy (H)**Dr Faisal.RR-A-009  | **Prayer & Lunch break** | **Practical 1**Group A **Anatomy (P-1)**Group B **Physiology (P-1)**Group C **Biochemistry (P-1)** |
| **Tuesday** | **Anatomy** (E&PND)Dr G.AnsariR-A-008 (b)  | **Biochemistry**Dr Javed.IR-B-002 | **Anatomy(G)**Dr Imran.AR-A-001 (b) | **Physiology**Dr Raheela.AR-P-001 (b) | **Biochemistry**Dr Khalida.AR-B-003 | **Practical 1**Group A **Physiology (P-1)**Group B **Biochemistry (P-1)**Group C **Anatomy (P-1)** |
| **Wednesday** | **Anatomy** (E&PND)Dr G.Ansari R-A-008 (c)  | **Biochemistry**Dr Dost.MKR-B-004 | **Anatomy(G)**Dr ZR.AlviR-A-002 (a) | **Physiology**Dr Sadia.JR-P-002 (a) | **Biochemistry**Dr Shafqat.NR-B-005 | **Practical 1**Group A **Biochemistry (P-1)**Group B **Anatomy (P-1)**Group C **Physiology (P-1)** |
| **Thursday** | **Anatomy** (E&PND)Dr G.AnsariR-A-008 (d)  | **Physiology**Dr M Irfan SRR-P-002 (b) | **Pathology**Dr HakeemR-Pa-001 (a) | **Physiology**Dr Tehseen.**I**R-P-003 (a) | **Biochemistry**Dr Javed.IR-B-006 | **Pharmacology**Dr Zameer ASR-Ph-001 (a) | **Aging**Dr A Yar MR-Ag-001 |
| **Friday** | **Anatomy** (E&PND)Dr G.AnsariR-A-008 (e)  | **Physiology**Dr Raheela.AR-P-003 (b) | **Pathology**Dr NaqeebR-Pa-001 (b) | **Physiology**Dr Sadia.JR-P-004 (a) | **Biochemistry**Dr Khalida.AR-B-007 | **Anatomy demonstration** (Group A)**Self directed learning** (Group B & C) |

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| **(Week 2) Block 4 , Module 7: Renal 1: / /2025-26 to / /2025-26** |
| **Days** | **8:00 am****9:00 am** | **9:00 am****10:00 am** | **10:00****10:20 am** | **10:20 am****11:20 am** | **11:20 am****12:20 pm** | **12:20 pm****01:20 pm** | **01:20****02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **Anatomy(G)**Dr Faisal.RR-A-002 (b)  | **Physiology**Dr M Irfan SRR-P-004 (b) | **Tea break** | **Anatomy (H)**Dr Imran.AR-A-010  | **Biochemistry**Dr Dost.MKR-B-008 | **Behavioral Sciences**Dr Mehwish AR-BhS-001 | **Prayer & Lunch break** | **Practical/Skill Lab 2**Group A **Skill Lab 1**Group B **Physiology (P-2)**Group C **Biochemistry (P-2)** |
| **Tuesday** | **Group A Anatomy Tuto** RA-003**Group B Physiology SGD** R-P-005**Group C Biochem PBL** R-B-009/10 | **Group A Biochem PBL** RB-009/10**Group B Anatomy Tuto** RA-003**Group C Physiology SGD** RP-005 | **Pathology**Dr HakeemR-Pa-002 (a) | **Practical/Skill Lab 2**Group A **Physiology (P-2)**Group B **Biochemistry (P-2)**Group C **Skill Lab 1** |
| **Wednesday** | **Group A Physiology SGD** RP-005**Group B Biochem PBL** RB-009/10**Group C Anatomy Tuto** RA-003 | **Pharmacology**Dr Zameer ASR-Ph-001 (b) | **Physiology**Dr Sadia.JR-P-006 (a) | **Pathology**Dr NaqeebR-Pa-002 (b) | **Practical/Skill Lab 2**Group A **Biochemistry (P-2)**Group B **Skill Lab 1**Group C **Physiology (P-2)** |
| **Thursday** | **Holy Quran**Heirship/virasatDr A Majid | **Physiology**Dr M Irfan SRR-P-006 (b) | **Biochemistry**Dr Khalida.AR-B-011 | **Physiology**Dr Tehseen.IR-P-007 (a) | **PERLs**2-05EthicsDr M Tariq K | **Clinical Skill Foundation 1**(Please refer to skill lab manual for wards and groups distribution of CSF) |
| **Friday** | **Holy Quran**Marof & MunkirDr A Majid | **Physiology**Dr Raheela.AR-P-007 (b) | **Biochemistry**Dr Dost.MKR-B-012 | **Physiology**Dr Sadia.JR-P-008 (a) | **Islamiat**Quran as guideMiss Kanwal | **Anatomy demonstration** (Group B)**Self directed learning**(Group A & C) |

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| **(Week 3) Block 4 , Module 7: Renal 1: / /2025-26 to / /2025-26** |
| **Days** | **8:00 am****9:00 am** | **9:00 am****10:00 am** | **10:00****10:20 am** | **10:20 am****11:20 am** | **11:20 am****12:20 pm** | **12:20 pm****01:20 pm** | **01:20****02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **Anatomy(G)**Dr Imran.A R-A-004 (a)  | **Physiology**Dr M Irfan SRR-P-008 (b) | **Tea break** | **Biochemistry**Dr Shafqat.NR-B-013 | **Pathology**Dr HakeemR-Pa-003 (a) | **Anatomy (H)**Dr ZR.AlviR-A-011  | **Prayer & Lunch break** | **Practical/Skill Lab 3**Group A **Skill Lab 2**Group B **Physiology (P-3)**Group C **Biochemistry (P-3)** |
| **Tuesday** | **Anatomy(G)**Dr Faisal.R R-A-004 (b)  | **Physiology**Dr Tehseen.IR-P-009 (a) | **Biochemistry**Dr Javed.IR-B-014 | **Pathology**Dr NaqeebR-Pa-003 (b) | **Pharmacology**Dr Zameer ASR-Ph-001 (c) | **Practical/Skill Lab 3**Group A **Physiology (P-3)**Group B **Biochemistry (P-3)**Group C **Skill Lab 2** |
| **Wednesday** | **Anatomy(G)**Dr Imran.A R-A-005 (a) | **Physiology**Dr Raheela.AR-P-009 (b) | **Biochemistry**Dr Khalida.AR-B-015 | **Community Medicine**Dr Ali.HR-CM-001 | **PERLs**2-06EthicsDr M Tariq K | **Practical/Skill Lab 3**Group A **Biochemistry (P-3)**Group B **Skill Lab 2**Group C **Physiology (P-3)** |
| **Thursday** | **Islamiat**Holy Prophet (PBUH)Miss Kanwal | **Physiology**Dr Sadia.JR-P-010 (a) | **Biochemistry**Dr Dost.MKR-B-016 | **Physiology**Dr M Irfan SRR-P-010 (b) | **PERLs**2-07ResearchDr M Tariq K | **Clinical Skill Foundation 2**(Please refer to skill lab manual for wards and groups distribution of CSF) |
| **Friday** | **Pakistan Studies**Pak movementMr Jaffar | **Physiology**Dr Tehseen.IR-P-011 (a) | **Biochemistry**Dr Shafqat.NR-B-017 | **Physiology**Dr Raheela.AR-P-011 (b) | **Civics**Relation with social sciencesDr A Majid | **Anatomy Demonstration**(Group C)**Self directed learning**(Group A & B) |

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| **(Week 4) Block 4 , Module 7: Renal 1: / /2025-26 to / /2025-26** |
| **Days** | **8:00 am****9:00 am** | **9:00 am****10:00 am** | **10:00****10:20 am** | **10:20 am****11:20 am** | **11:20 am****12:20 pm** | **12:20 pm****01:20 pm** | **01:20****02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **Anatomy(G)**Dr ZR.Alvi R-A-005 (b)  | **Physiology**Dr Sadia.JR-P-012 | **Tea break** | **Biochemistry**Dr Javed.IR-B-018 | **Anatomy (H)**Dr Faisal.RR-A-012  | **Physiology**Dr M Irfan SRR-P-013 | **Prayer & Lunch break** | **Practical 4**Group A **Anatomy (P-2)**Group B **Physiology (P-4)**Group C **Biochemistry (P-4)** |
| **Tuesday** | **Anatomy(G)**Dr Imran.A R-A-006 (a)  | **Physiology**Dr Tehseen.IR-P-014 | **Biochemistry**Dr Khalida.AR-B-019 | **Pathology**Dr HakeemR-Pa-004 | **Pharmacology**Dr Zameer ASR-Ph-001 (d) | **Practical 4**Group A **Physiology (P-4)**Group B **Biochemistry (P-4)**Group C **Anatomy (P-2)** |
| **Wednesday** | **Anatomy(G)**Dr ZR.Alvi R-A-006 (b)  | **Physiology**Dr Raheela.AR-P-015 | **Biochemistry**Dr Dost.MKR-B-020 | **Physiology**Dr Sadia.JR-P-016 | **PERLs**2-08LeadershipDr M Tariq K | **Practical 4**Group A **Biochemistry (P-4)**Group B **Anatomy (P-2)**Group C **Physiology (P-4)** |
| **Thursday** | **Civics**Harmonic relationshipDr A Majid | **Physiology**Dr M Irfan SRR-P-017 | **Biochemistry**Dr Shafqat.NR-B-021 | **Pathology**Dr NaqeebR-Pa-005 | **Aging**Dr A Yar MR-Ag-002 | **English 7-1**Miss Anum | **Self directed learning** |
| **Friday** | **Pakistan Studies**Creation of pakMr Jaffar | **Physiology**Dr Tehseen.IR-P-018 | **Biochemistry**Dr Javed.IR-B-022 | **Physiology**Dr Raheela.AR-P-019 | **English 7-2**Miss Anum | **Practical/PBL/CBL 5**Group A **Anatomy (P-3)**Group B **Medicine (PBL)**Group C **Surgery (CBL)** |

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| **(Week 5) Block 4 , Module 7: Renal 1: / /2025-26 to / /2025-26** |
| **Days** | **8:00 am****9:00 am** | **9:00 am****10:00 am** | **10:00****10:20 am** | **10:20 am****11:20 am** | **11:20 am****12:20 pm** | **12:20 pm****01:20 pm** | **01:20****02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **Physiology**Dr Sadia.JR-P-020 | **Anatomy(G)**Dr Faisal.RR-A-007 (a)  | **Tea break** | **Physiology**Dr M Irfan SRR-P-021 | **Pathology**Dr HakeemR-Pa-006 | **Physiology**Dr Tehseen.IR-P-022 | **Prayer & Lunch break** | **Practical/PBL/CBL 5**Group A **Medicine (PBL)**Group B **Surgery (CBL)**Group C **Anatomy (P-3)** |
| **Tuesday** | **Physiology**Dr Raheela.AR-P-023 | **Anatomy(G)**Dr Imran.AR-A-007 (b)  | **Physiology**Dr Sadia.JR-P-024 | **Biochemistry**Dr Khalida.AR-B-023 | **Physiology**Dr M Irfan SRR-P-025 | **Practical/PBL/CBL 5**Group A **Surgery (CBL)**Group B **Anatomy (P-3)**Group C **Medicine (PBL)** |
| **Wednesday** | **Dissection/TBL/PBL 6**Group A **Anatomy (Dissection)**Group B **Physiology TBL**Group C **Biochemistry PBL** | **Self directed learning** | **Dissection/TBL/PBL 6**Group A **Physiology TBL**Grop B **Biochemistry PBL**Group C **Anatomy (Dissection)**  | **Dissection/TBL/PBL 6**Group A **Biochemistry PBL**Group B **Anatomy (Dissection)**Group C **Physiology TBL** |
| **Thursday** | **End of Block Examination (Theory)** | **End of Block Examination (Theory)** | **End of Block Examination (Theory)** |
| **Friday** | **End of Block Examination (OSPE/OSVE/OSCE/Pract.etc)** | **End of Block Examination (OSPE/OSVE/OSCE/Pract.etc)** | **End of Block Examination (OSPE/OSVE/OSCE/Pract.etc)** |

**DISTRIBUTION AND DURATION OF TEACHING ACTIVITIES**

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| --- |
| Block 4, Module 7: Renal 1 (Minimum Recommended Hours = 119 hours) |
| Subject  | **Hours (Theory)**  | **Hours****practical** | **SGD/TBL/Tuto****PBL/CBL/Demo** | **Total hours** |
| Anatomy | 12( GA)+05 E&PND+ 04 Histology= 23 | 03 practical = 06 hours | 1 Demo + 1 Tuto+1 diss = 06 hours | **33** |
| Physiology | 34 | 04 practical = 08 hours | 1 SGD+1 TBL = 04 hours | **46** |
| Biochemistry | 21 | 04 practical = 08 hours | 2 PBL = 04 hours | **33** |
| Pharmacology | 04 |  |  | **4** |
| Pathology | 09 |  |  | **9** |
| Community Medicine | 01 |  |  | **1** |
| Medicine |  |  | 01 PBL = 02 hours | **2** |
| Surgery |  |  | 01 CBL = 02 Hours | **2** |
| Aging | 02 |  |  | **2** |
| Behavioral Sciences | 01 |  |  | **1** |
| PERLs | 04 |  |  | **4** |
| Clinical skill Foundation (CSF) |  | 02 = 04 Hours |  | **4** |
| Skill lab |  | 02 = 04 hours |  | **4** |
| Holy Quran | 02 |  |  | **2** |
| Islamiat | 02 |  |  | **2** |
| Pakistan studies | 02 |  |  | **2** |
| Civics | 02 |  |  | **2** |
| English 1 | 02 |  |  | **2** |
| Self directed learning | 06 |  |  | **6** |
| Total | **121** | **30** | **18** | **161** |
| 7 hours/day = 35 hours/week × (4 weeks & 3 Days) = 161 hours |

**LEARNING OUTCOMES**

* Discuss the gross and microscopic anatomy of kidney and urinary system.
* Explain the embryological development of kidney and urinary tract
* Explain common developmental abnormalities of renal system
* Identify role of renal system in maintaining blood pressure and acid base balance
* Enlist functions of kidney and pathologies related to them.
* Explain method of electrolyte balance and pathologies related to it.
* Highlight pathologies related to kidneys and their distinctive clinical features
* Interpret investigations done to diagnose abnormal structural and functional presentations.

**AIMS:** The **Renal Module** aims to:

1. Understand the structure, function, and regulation of the renal system.
2. Identify common renal disorders and their pathophysiology.
3. Develop skills in diagnosing and managing renal conditions.
4. Interpret clinical signs, lab tests, and imaging related to kidney function.
5. Promote ethical, patient-centered care and teamwork in renal health management.

**MODULE RATIONAL**

The renal module for second-year MBBS (Bachelor of Medicine, Bachelor of Surgery) students is a crucial component of the medical curriculum. This module is designed to provide students with a comprehensive understanding of the structure, function, and pathology of the kidneys, as well as the principles of renal physiology and the clinical management of and electrolyte balance, acid-base balance, and blood pressure. Understanding renal physiology is essential for comprehending various disease renal disorders. Here are some key rationales for including a renal module in the curriculum.

**IMPLEMENTATION TORS**

* The time calculation for completion of modules and blocks is based on 35 hours per week. Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are 1260.
* The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning & assessment as per decision of institutional academic council.
* The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these.
* However, the level of cognition can be kept at a higher level by the institution.
* The Table of Specifications provided will be used for the three papers of the Second professional examination. The same table of specifications should be used for the respective three block exams for internal assessment.

**COURSE CONTENT, CODES & SPECIFIC LEARNING OBJECTIVES**

**NORMAL STRUCTURE**

**GROSS ANATOMY**

**Human Anatomy**

**R-A-001**: Kidney

* Describe gross features and facial coverings of kidneys.
* Compare and contrast the relations of right and left kidneys.
* Describe blood supply, lymphatics and nerve supply of kidney
* Discuss the clinical aspects of kidneys
* Demonstrate the surface marking and radiographic anatomy of kidney.
* Identify the side of kidney

**R-A-002:** Ureter

* Compare and contrast the relations of right and left ureter
* Give the constrictions of ureter
* Describe the blood supply nerve supply and lymphatics of ureter Identify the ureter

**R-A-003:** Urinary bladder

* Describe the gross anatomical features, relations, surfaces, blood supply, nerve supply and lymphatics of urinary bladder
* Give the clinical correlates of urinary bladder
* Identify the gross features and surfaces of urinary bladder

**R-A-004:** Sign/symptom investigations (Integrate with Urology)

* Interpret basic urological signs/symptoms & investigations**.**

**R-A-005:** Urinary retention (Integrate with Urology)

* Describe the etiology, and management of urinary retention.

**R-A-006:** Radiograph (Integrate with Radiology)

* Identify and describe the various anatomic landmarks of the renal system on radiographs.

**R-A-007:** Urethra

* Describe the parts of urethra

**EMBRYOLOGY & POST-NATAL DEVELOPMENT**

**Embryology**

**R-A-008:** Development of urinary system

* Describe development of intermediate mesoderm and its derivatives
* Describe the development of pronephros, mesonephros and metanephros
* Describe positional changes during descent of kidney with correlation to its blood supply
* Describe the development of urinary bladder and urethra
* List and describe the common congenital anomalies of kidney, urinary bladder and urethra.

**MICROSCOPIC STRUCTURE**

**Histology**

**R-A-009:** Structure of kidney

* Describe the histological, structural organization and functions of kidney with clinicals

**R-A-010:** Juxtaglomerular apparatus

* Describe the light and ultrastructure of Juxtaglomerular apparatus and glomerular filtration barrier

**R-A-011:** Structure of ureter

* Describe the histological structure of ureter

**R-A-012:** Structure of urinary bladder

* Describe the histological structure of urinary bladder
* Discuss clinical correlates (Cystitis, Urinary bladder cancer, Urinary Tract Infections (UTIs))

**PRACTICAL**

**HISTOLOGY**

**R-A-013:** Kidney

* Identify and draw and label the histological structure of kidney and enumerate points of identification

**R-A-014:** Ureter

* Identify, draw and label the histological structure of ureter and enumerate its points of identification

**R-A-015:** Urinary bladder

* Identify, draw and label the histological structure of urinary bladder and enumerate its points of identification

**NORMAL FUNCTION**

**MEDICAL PHYSIOLOGY**

**R-P-001:** Body fluid compartment

* Describe major composition of intracellular and extracellular fluids
* Define Hypo and hypernatremia
* Explain the causes of hypo & hypernatremia and their effects on Composition of body fluid compartments
* Describe difference between iso-osmotic, hyperosmotic, hypo-osmotic fluids **R-P-002:** Edema (Integrate with Medicine)
* Enumerate causes of Intracellular and extracellular edema
* Describe safety factors that prevent edema

**R-P-003:** Function

* Explain the functions of the kidney

**R-P-004:** Micturition reflex

* Describe the mechanism of micturition and its control
* Explain the role of higher center on micturition
* Explain the physiological anatomy and innervation of bladder
* Discuss the voluntary control of micturition

**R-P-005:** Abnormalities of micturition (Integrate with Pathology)

* Explain the causes, pathophysiology, and features of atonic bladder.
* Discuss the causes, pathophysiology, and features of automatic bladder.
* Write the causes, pathophysiology, and features of uninhibited neurogenic bladder

**R-P-006:** Urine formation

* Enlist the steps of urine formation
* Explain the physiological anatomy and functions of glomerular capillary membrane
* Discuss the composition of filtrate
* Explain the minimal change nephropathy and increase permeability to plasma protein

**R-P-007:** Glomerular filtration

* Define Glomerular Filtration Rate (GFR).
* Describe the determinants of GFR
* Explain the factors affecting GFR
* Discuss the hormones and autocoids that affect GFR
* Explain mechanisms of autoregulation of GFR
* Enlist the physiological and pathological factors that decrease GFR Explain the effects of angiotensin II blocker on GFR during renal hypoperfusion

**R-P-008:** Reabsorption

* Enumerate different types of transport along the kidney tubules for reabsorption
* Explain the reabsorption and secretion along different parts of the Nephron
* Explain the regulation of tubular reabsorption
* Discuss the forces / pressure and hormones that determine renal tubular reabsorption
* Explain the reabsorption of water along different parts of nephron Define obligatory and facultative reabsorption
* Discuss the characteristics of late distal tubules and cortical collecting ducts Discuss the characteristics of medullary collecting ducts

**R-P-009**: Clearance method

* Explain the use of clearance method to quantify kidney function

**R-P-010**: Transport maximum

* Describe mechanism of re-absorption of sodium along different parts nephrons
* Define and explain the term Transport maximum for the substances
* Define filtered load for the substance
* Justify the difference of transport maximum and renal threshold of glucose in renal tubules

**R-P-011:** Urine concentration and dilution

* Explain the renal mechanisms for excreting dilute urine
* Explain the mechanism for forming a concentrated urine
* Discuss the role of urea in the process of counter current multiplier mechanism
* Describe the countercurrent exchange in vasa recta to preserve hyperosmolarity of renal medulla

**R-P-012**: Obligatory urine volume

* Define and explain the term obligatory urine volume.
* Define and explain free water clearance.
* Define Urine specific gravity.

**R-P-013:** Disorders of urine concentrating ability

* Enumerate different abnormalities of urinary concentrating ability

**R-P-014:** Diabetes (Integrate with Medicine)

* Enumerate the types of Diabetes insipidus
* Enlist the features of diabetes insipidus
* Explain the pathophysiology and treatment of central diabetes insipidus
* Discuss the pathophysiology of nephrogenic diabetes insipidus

**R-P-015:** Osmoreceptor-ADH Feedback System

* Make the flow chart to show the osmoreceptor antidiuretic hormone (ADH) feedback mechanism for regulating extracellular fluid osmolarity in response to a water deficit.
* Enlist the factors which increase and decrease the release of ADH

 **R-P-016:** Thirst

* Explain the mechanism of thirst

**R-P-017:** Renal regulation of potassium

* Enumerate the factors that can alter potassium distribution between intracellular and extracellular fluids
* Discuss the process of secretion of potassium by renal tubules
* Explain the regulation of internal potassium distribution and potassium secretion

**R-P-018:** Control of ECF osmolarity

* Explain the control of extracellular fluid osmolarity and sodium concentration

**R-P-019:** Control of ECF

* Explain the integration of renal mechanism for control of extracellular fluid (ECF) Explain the importance of pressure natriuresis and diuresis in maintaining body sodium and fluid balance

**R-P-020:** Renal regulation of calcium and renal regulation of phosphate

* Explain the renal handling of calcium concentration to regulate plasma calcium concentration
* Enumerate the factors that alter renal calcium
* Enlist the factors that alter renal phosphate excretion

**R-P-021:** Renal body fluid feedback control

* Explain the nervous and hormonal factors that increase the effectiveness of renal body fluid feedback control

**R-P-022:** ECF and blood volume

* Explain the conditions that cause large increase in blood volume and ECF volume
* Explain the conditions that cause large increase ECF volume but with normal blood volume

**R-P-023:** Acid base balance

* Explain the renal handling of H+ion.

**R-P-024:** Acid base disturbance

* Analyze the acid base disturbances on the basis of pH, HCO3- and CO2
* Explain the causes and compensation of metabolic acidosis
* Explain the causes and compensation of metabolic alkalosis
* Explain the causes and compensation of respiratory acidosis
* Explain the causes and compensation of respiratory alkalosis
* Explain the causes and compensation of mixed acid base disorder

**R-P-025:** Anion gap

* Define and explain anion gap

**MEDICAL BIOCHEMISTRY**

**R-B-001:** Protein digestion and absorption, reabsorption, and related disorders

* Describe digestion and absorption of dietary proteins along with the inherited and acquired disorders (peptic ulcer, Hartnup disease, gluten enteropathy and cystic fibrosis).
* Elaborate the mechanisms involved in renal reabsorption of amino acids and discuss related disorders (Hartnup disease and cystinuria)

**R-B-002** Protein Metabolism/Protein degradation and turnover

* Clearly differentiate between protein digestion and degradation.
* Compare the salient feature of the two major mechanisms for degradation of body proteins.
* Elaborate the concept of protein turnover and quote examples of short lived and long-lived proteins.

**R-B-003**: Protein Metabolism/Amino acid pool and nitrogen balance

* Define amino acid pool.
* Delineate the sources and fates of amino acids. Give definition of nitrogen balance and its three states. Give physiological and/or pathological conditions associated with each state of nitrogen balance.

**R-B-004**: Protein Metabolism/Introduction to Reactions involved in catabolism

* Enlist 7 important reactions involved in amino acid metabolism and give a brief introduction of each (Deamination, Transamination, Trans-deamination, Deamidation, Decarboxylation, Transmethylation & Transpeptidation)

**R-B-005**: Protein Metabolism/Transamination

* Define transamination. Describe the reactions catalyzed by ALT (alanine transaminase) and AST (aspartate aminotransferase) with special reference to the role of pyridoxal phosphate in the transfer of amino group.
* Give diagnostic and prognostic importance of serum ALT and AST.
* Elaborate the importance of transamination reaction in amino acid metabolism.

**R-B-006**: Protein Metabolism/Trans deamination

* Define oxidative deamination.
* Describe the reaction catalyzed by glutamate dehydrogenase (GDH) along with its significance.
* Define trans-deamination.

**R-B-007**: Protein Metabolism/Deamidation

* Define deamidation.
* Describe deamidation reaction catalyzed by glutaminase and asparaginase along with their significance.
* Explain how does L-asparaginase helps in the management of certain types of leukemia.
* Elaborate the mechanism for shunting of glutamine from liver to kidneys during acidosis. Give advantage of shunting.

**R-B-008**: Protein Metabolism/Decarboxylation

* Define decarboxylation. Describe important decarboxylation reactions along with their significance.

**R-B-009**: Protein Metabolism/Sources and transport of ammonia

* Give sources of ammonia in human body.
* Describe how ammonia is transported to liver with special reference to the role of glutamine and alanine in this transport mechanism.
* **R-B-010**: Protein Metabolism/Urea cycle, ammonia intoxication and its management Elaborate the reactions and regulation of urea cycle.
* Enlist the inherited and acquired causes of hyperammonemia in each condition.
* Give the biochemical mechanisms underlying ammonia intoxication.
* Discuss dietary and therapeutic measures for the management of patients with hyperammonemia (phenyl butyrate, lactulose, antibiotics).

**R-B-011**: Protein Metabolism/Biosynthesis of NEAA

* Trace the pathways for synthesis of non-essential amino acids (NEAA) (alanine, aspartate, glutamate, glutamine, asparagine, proline, serine, glycine, cysteine, and tyrosine)

**R-B-012**: Protein Metabolism/Degradation of carbon skeleton of amino acids

* Discuss the fate of carbon skeletons of amino acids.
* Categorize amino acids into glucogenic, ketogenic or both depending upon the intermediates produced during their catabolism.
* Outline the catabolic pathways of amino acids that yield oxaloacetate.
* Outline the catabolic pathways of amino acids that yield α-ketoglutarate.
* Outline the catabolic pathways of amino acids that yield pyruvate.
* Outline the catabolic pathways of amino acids that yield fumarate.
* Outline the catabolic pathways of amino acids that yield succinyl CoA.
* Outline the catabolic pathways of amino acids that yield acetyl CoA or acetoacetyl CoA.

**R-B-013:** Protein Metabolism/Inborn errors of amino acid metabolism (integrate with Pediatrics)

* Describe the metabolism of methionine.
* Discuss cause, Key diagnostics features and management of homocystinuria.
* Describe the catabolism of branched chain amino acids.
* Discuss cause, key diagnostic features, and management of Maple Syrup Urine disease (MSUD).
* Describe the metabolism of tyrosine.
* Discuss the cause, key diagnostic features, and management of alkaptonuria, albinism, and type 1 tyrosinemia.
* Give cause, key diagnostic features, and management of phenylketonuria (PKU)
* Elaborate special roles of glycine, tryptophan, phenylalanine, tyrosine, and methionine

**R-B-014**: Water, pH, Buffers/ Ionization of water

* Describe ionization of water and elaborate its significance. Discuss water and electrolyte balance. in health and disease.

**R-B-015**: Water, pH, Buffers/pH and pH scale

* Define pH and describe the concept of pH scale.

**R-B-016**: Water, pH, Buffers/weak acids, and their significance

* Define weak acids and conjugate base.

**R-B-017**: Water, pH, Buffers/Ka and pKa

* Define Ka and pKa and give their significance.

**R-B-018**: Water, pH, Buffers/HH equation and its applications

* Describe Henderson-Hassel Bach (HH) equation. (no derivation required) along with its application/use.

**R-B-019**: Water, pH, Buffers/HH equation and its applications

* Define buffers.
* Enumerate the component of a buffers system and describe their mechanism of action.
* Enlist important buffers present in blood, plasma, ECF (Extra Cellular Fluid), ICF (Intra Cellular Fluid) and renal tubular fluid.
* Elaborate the working of bicarbonate buffer and phosphate buffer.

**R-B-020**: Acid Base balance and imbalance/Renal mechanisms for pH regulation

* Elaborate the role of kidneys in the regulation of acid base balance.

**R-B-021**: Defense mechanisms against changes in H+ concentration

* Elaborate the concept of 1st, 2nd and 3rd line of defense against changes in H+ ion concentration.
* **R-B-022**: Acid Base imbalance/Types of acid base disorders (Integrate with Medicine) Define acidosis and alkalosis.
* Classify acid base disorders.
* Enlist causes of metabolic acidosis and give its compensation.
* Enlist causes of respiratory acidosis and give its compensation.
* Enlist causes of metabolic alkalosis and give its compensation.
* Enlist causes of respiratory alkalosis and give its compensation.

**R-B-023**: Acid Base imbalance/Tetany in alkalosis

* Interpret metabolic and respiratory disorders of acid base balance on basis of sign, symptoms and arterial blood gas (ABG) findings
* Give biochemical explanation for tetany associated with alkalosis.

**PRACTICAL**

**R-B-024**: Interpretation of results

* Estimate serum creatinine level and interpret your results.
* Compare the usefulness of blood urea and serum creatinine in assessment of renal functions.
* Determination of proteins in urine by dipstick method and interpret your results.
* Estimate serum acid phosphatase level and interpret your results**.**

**PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS**

**PHARMACOLOGY & THERAPEUTICS**

**R-Ph-001:** Diuretics

* Classify diuretics & carbonic anhydrase inhibitor MOA, clinical uses, and adverse effects
* Describe Thiazide & loop diuretics their Mechanism of Action, clinical uses, and adverse effects.
* Describe Potassium sparing and osmotic diuretics, their mechanism of action, clinical uses, and adverse effects.

**PATHOLOGY**

**R-Pa-001:** Renal Stones

* Discuss the etiology and pathogenesis of different types of stones

**R-Pa-002:** Hydronephrosis

* Identify the causes, morphological aspect & outcome of hydronephrosis.

**R-Pa-003:** UTI causative agents

* Enlist common causative agents of urinary tract infections and describe pathogenesis and clinical features of common causative agents of UTI.

**R-Pa-004:** Glomerulonephritis

* Define various presentations of glomerulonephritis.
* Define nephrotic and nephritic syndrome.
* List various risk factors and outline management of glomerulonephritis.

 **R-Pa-005:** Acute Kidney Injury (Integrate with Medicine)

* Define AKI (acute kidney injury)
* Identify various risk factors and causes for AKI.
* Outline management strategies

**R-Pa-006**: Urinary tract infection (Integrate with Medicine)

* Define UTI (Urinary Tract Infection)
* Identify various risk factors and causes of UTI.
* Describe signs and symptoms of UTI.
* Outline management strategies.

**DISEASE PREVENTION AND IMPACT**

**COMMUNITY MEDICINE AND PUBLIC HEALTH**

**R-CM-001:** Quality of life

* Discuss the significance of quality of life in disease and treatment settings.
* Measures of health status.
* Disability-Adjusted Life Year (DALY) and Quality Adjusted Life Year (QALY)
* Life expectancy.

**BEHAVIORAL SCIENCES**

* **R-BhS-001:** Dementia, uremic encephalopathy, delusion, muscle paralysis & Societal impact To identify the behavioral abnormalities caused by renal function.
* To identify the cognitive abnormality.
* To identify the dangers for the patient, his family, and society.

**AGING**

**R-Ag-001**: Disease prevention

* To define preventive care in diseases related to urinary system(adults). Primary, secondary, and tertiary prevention.

**R-Ag-002:** Urinary incontinence

* Define urinary incontinence.
* Outline management strategies**.**

**CLINICAL SKILLS FOUNDATION**

**CFRC-2**

**Renal-1**

* Detail the steps of urinary catheterization in females
* Detail the steps of urinary catheterization in males

**OPERATIONAL DEFINITIONS**

|  |
| --- |
| **Large group interactive session (LGIS)** |
| Lecture format is the most widely used approach to teaching especially in a large class size with average attention span of 20-30 mins. Interactive lecturing involves a two-way interaction between the presenter and the participants. Interactive methods like brain storming buzz group, simulation, role play, and clinical cases can be used.**Significance of its usage**Relaxed environment, diverse opinions, Increase attention & motivation. Independence & group skills. Cost effective. Suitable for taking advantage of available  |
| **Team Based learning** |
| TBL is a uniquely powerful form of small group learning. It provides a complete coherent framework for building a flipped course experience. There are four essential elements of TBL which include:Teams must be properly formed and managed (5-7 students) Getting students readyApplying course concepts Making students accountable.**Significance of its usage**Students are more engaged.Increased excitement in TBL classroom Teams outperforms best members.Students perform better in final and standardized exams. |
| **Problem Based Learning (PBL)** |
| It is an instructional student-centered approach in which students work in small groups on a health problem, identifying their own educational needs and being responsible for the acquisition of the knowledge required to understand the scenario. **Significance of its usage**Teamwork, Critical evaluation of literature, Self-directed learning and use of resources Presentation skills Leadership |
| **Case Based Learning (CBL)** |
| It is an inquiry structured learning experience utilizing live or simulated patient cases to solve, or examine a clinical problem, with the guidance of a teacher and stated learning objectives.**Significance of its usage**Induce a deeper level of learning by inculcating critical thinking skills. Flexibility on use of caseStudents acquire insightful information. Stay abreast with novel advancements in healthcare. |
| **Tutorial** |
| Tutorial is a class or short series of classes, in which one or more instructors provides intensive instruction on some subject to a small group. Its purpose is to explore point of view and guide towards directed, reflective learning skills.**Significance of its usage**Develop and assess the extent of background knowledge of students, which enables them to properly understand concepts which may not have been understood in lectures.Develop problem-solving skills. Develop practice of self-learning. Reduced time to understand the topic. |
| **Skill lab** |
| It refers to specifically equipped practice rooms functioning as training facilities offering hands on training for the practice of clinical skills within non-threatening environment prior to their real-life application This applies to both basic clinical skills as well as complex surgical skills.**Significance of its usage**Controlled, anxiety-free, and risk-free learning environment to students. A platform for repeated practice for mastery in relevant clinical skills Increase the preparedness of student learners before transitioning to the real hospital setting.Build strong communication skills.Enable learners to make critical decisions. |
| **Lab practical** |
| Lab practical involve things like identifying a structure, a type of stain through a microscope, a problem with a preparation, reading biochemical test results and answering safety questions. These simulations allow students to attempt the experiments in the laboratory in a risk-free way that provides the opportunity to make mistakes and learn how to correct them using the immediate feedback generated. **Significance of its usage**Enhance mastery of subject matter. Develop scientific reasoning. Develop practical skills. Develop teamwork abilities. |
| **Demonstration** |
| The demonstration method in teaching can be defined as giving a demo or performing a specific activity or concept. It is a teaching-learning process carried out in a systematic manner.**Significance of its usage**Promotes learning and correlates theory with practice. Sharpens the observation skills.Sustain interests in learning environment. Helps teacher to evaluate students response |
| **Reflective writing** |
| It is a metacognitive process that occurs before, during and after the situation with the purpose of developing greater understanding of both the self and situation so that future encounters with the situation are informed from previous encounters.Significance of its usage Questioning attitude and new perspectives. Areas for change and improvement. Respond effectively to new challenges. Critical thinking and coping skills |
| **Bedside teaching** |
| Teaching and learning that occurs with actual patient as the focus. It occurs in wards, emergency departments, operating rooms, and high dependency units.Significance of its usage Stimulus of clinical contact Psychomotor skills Communication skills Language skills Interpersonal skills Professional attitudes and empathy Role modeling |
| **Simulation** |
| Person, device or set of conditions, which attempts to present education and evaluation of problems authentically. The student or trainee is required to respond to the problems as she/he would under natural circumstances.Significance of its usage Safety for patients Liberty to make mistakes. Manageable/variable complexity of tasks Opportunity to develop self-efficacy before real patient encounter. Repeatability of tasks Learning at different pace is permissible |
| **Clinical case based conference** |
| Clinical Case based conferences allow clinicians and medical students to present difficult case material and include discussions of diagnostic, clinical formulation, and/or treatment issues.Significance of its usage Provides detailed (rich qualitative) information. Provides insight for further research. Permitting investigation of otherwise impractical (or unethical) situations. |
| **Ward rounds** |
| It is a composite clinical practice to review inpatients’ management and progress, to make decisions about further investigations, treatment options and discharge from hospital. It is an opportunity for clinicians, students, and patients to participate in education and training at bedside.Significance of its usage Patient management skills History taking Physical examination Time management skills Communication skills |
| **Case presentations** |
| It is a teaching method which provides descriptive information about a clinical patient scenario and to share this educational experience with the general medical and scientific community. It prepares students for clinical practice, using authentic clinical cases by linking theory to practice with the help of inquiry-based learning methods.Significance of its usage Cultivate the capacity for critical analysis. Judgement and Decision making Facilitate creative problem solving. Allow students to develop realistic solutions to complex problems |

**ASSESSMENT POLICY**

A student must get pass marks in every discipline (i.e. obtain minimum 50%) in the aggregate theory marks. He/ She must also get minimum of 50% in the aggregate of the practical exams in order to pass. A student must get an aggregate of 50% marks in both theory and practical in order to be declared as pass or fail in that discipline.

**Attendance:** As per RYK Medical College, University of health sciences and Pakistan Medical & Dental Council guide lines, students are instructed to attend all the lectures, small group discussions, labs, clinical ward attachments and all other instructional activities.

**80% attendance is mandatory to sit in End of module examination and Annual examination. No student will be allowed to appear in examination, if the attendance is short.**

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| --- |
| **Block 4 – Table of Specifications** |
| **Theme** | **Subject** | **Written Exam** | **Oral/Practical/Clinical Exam** |
| **MCQ****(1 Mark each)** | **SEQ****(5 Mark each)** | **Total** **Marks** | **OSPE****(8 marks each observed)** | **OSCE****(8 marks each observed** | **OSVE****(16 marks each observed)** | **Marks** |
| **Normal structure** | Anatomy applied/clinical | 23 | 03 | 38 | 03 | - | 01 | 40 |
| **Normal function** | Physiology applied/clinical | 16 | 02 | 26 | 02 | - | 01 | 32 |
| Biochemistry applied/clinical | 20 | 02 | 30 | 02 | - | 01 | 32 |
| **Disease burden & prevention** | Community medicine & public health | 07 | - | 07 | - | - | - | - |
| Behavioral sciences | 06 | - | 06 | - | - | - | - |
| **Pathophysiology & pharmacotherapeutic** | Pathology  | 09 | - | 09 | - | - | - | - |
| Pharmacology | 04 | - | 04 | - | - | - | - |
| **CFRC** | CF-2-1 | - | - | - | - | 01 | - | 08 |
| **PERLs** | PERL-2-1 | - | - | - | - | 01 | - | 08 |
| **Total** |  | **85** | **7×5=35** | **120** | **07 stations ×08=56** | **02 stations×8=16** | **03 stations ×16=48** | **120** |

**Internal Evaluation**

* Students will be assessed comprehensively through multiple methods.
* 20% marks of internal evaluation will be added to UHS final exam. That 20% may include class tests, assignment, practicals and the internal exam which will all have specific marks allocation.

**Formative Assessment**

Individual department may hold quiz or short answer questions to help students assess their own learning. The marks obtained are not included in the internal evaluation

**For UHS Examination Policy, please consult UHS website!**

**RYKMC EXAMINATION RULES & REGULATIONS**

* Student must report to examination hall/venue, 30 minutes before the exam.
* Exam will begin sharp at the given time.
* No student will be allowed to enter the examination hall after 15 minutes of scheduled examination time.
* Students must sit according to their roll numbers mentioned on the seats.
* Cell phones are strictly not allowed in examination hall.
* If any student is found with cell phone in any mode (silent, switched off or on) he/she will be not be allowed to continue their exam.
* No students will be allowed to sit in exam without University Admit Card, RYKMC College ID Card and Lab Coat
* Student must bring the following stationary items for the exam: Pen, Pencil, Eraser, and Sharpener.
* Indiscipline in the exam hall/venue is not acceptable. Students must not possess any written material or communicate with their fellow students.

**ASSESSMENT SCHEDULE, OSPE/OSCE/OSVE & PRACTICAL SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
| **DATE** | **EXAMINATION** | **TIME** | **VENUE** |
| ---/---/2026 | Theory | --:-- to --:-- | Roll no 1 - 50 (multipurpose hall) |
| Roll no 51 – 100 (skill lab) |
| ---/---/2026 | OSPE/OSCE/OSVE | --:-- to --:-- | Roll no 1 – 50 (multipurpose hall) |
| ---/---/2026 | OSPE/OSCE/OSVE | --:-- to --:-- | Roll no 51–100 (multipurpose hall) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Station # 5****OSPE****Observed****Anatomy** | **→** | **Station # 6****Rest Station** | **→** | **Station # 7****OSCE****Observed****PERLs** | **→** | **Station # 8****Structured****OSVE****Biochemistry** |
| **↑** | **OSPE/OSCE/OSVE Scheme Map (BLOCK 4)** | **↓** |
| **Station # 4****Structured****OSVE****Anatomy** |

|  |  |  |
| --- | --- | --- |
| **Subject** | **Total Stations**  | **Station #** |
| **Anatomy OSPE Stations** | 3 | 1-5-10 |
| **Anatomy OSVE Station** | 1 | 4 |
| **Physiology OSPE stations** | 2 | 2-9 |
| **Physiology OSVE station** | 1 | 13 |
| **Biochemistry OSPE stations** | 2 | 3-11 |
| **Biochemistry OSVE station** | 1 | 8 |
| **C-FRC OSCE station** | 1 | 12 |
| **PERLS OSCE station** | 1 | 7 |
| **Rest stations** | 2 | 6-14 |
| **Total stations** | **14** |

 | **Station # 9****OSPE****Observed****Physiology** |
| **↑** | **↓** |
| **Station # 3****OSPE****Observed****Biochemistry** | **Station # 10****OSPE****Observed****Anatomy** |
| **↑** | **↓** |
| **Station # 2****OSPE****Observed****Physiology** | **Station # 11****OSPE****Observed****Biochemistry** |
| **↑** | **↓** |
| **Station # 1 OSPE****Observed****Anatomy** | **START****&****END** | **Station # 14****Rest Station** | **←** | **Station # 13****Structured****OSVE****Physiology** | **←** | **Station # 12****OSCE****Observed****C-FRC** |

**ASSESSMENT TOOLS & SAMPLE QUESTIONS**

**ASSESSMENT TOOLS:**

**Single best type** also known as MCQs (Multiple Choice Questions)

**MCQ:**

 A BCQ has a statement or clinical scenario of five options (likely answers).

**Correct answer carries one mark, and incorrect ‘zero mark’. There is NO negative marking.**

Students mark their responses on specified computer-based sheet designed for RYKMC.

**Sample BCQs:**

A 25 year old male patient presented with complains of productive cough, breathlessness and wheezing. He has been diagnosed with chronic obstructive pulmonary disease.

The most common risk factor for the disease is:

a) Air pollution

b) Coal mining

c) Glass industries

d) Pharmaceutical industries

 e) Tobacco smoke

**OSPE, OSVE, OSCE & Practical:** Please consult the proposed plan

* It may comprise between 12- 25 stations.
* The content may assess application of knowledge, or practical skills.
* Student will complete task in defined time at one given station.
* All the students are assessed on the same content by the same examiner in the same allocated time.
* A structured examination will have observed, unobserved, interactive and rest stations.

**Observed and interactive stations:**

They will be assessed by internal or external examiners through the task or viva.

**Unobserved station (Static):**

It will be static station in which students will have to answer the questions related to the given pictures, models or specimens on the provided response sheet.

**Rest station**: It is a station where no task is given, and during this time student can organize his/her thoughts.

**BOOKS AND RECOMMENDED READINGS**

**Anatomy**

* Gray’s anatomy.
* Langman’s medical embryology.
* Snell’s clinical anatomy.
* Snell’s clinical neuroanatomy. Walter kluwer.
* Laiq H.S Medical histology. Paramount books.
* Laiq H.S general anatomy. Paramount books.
* Wheater’s functional histology.

**Physiology**

* Guyton AC and Hall text book of medical physiology, W,B sunders & co.
* Essentials of medical physiology by Mushtaq Ahmad.

Ganong Physiology.

**Biochemistry**

* Harper’s biochemistry by Robert k murray, daryl k, granner McGraw-hill.
* Lippincott’s illustrated reviews biochemistry Champe, P.C & Harvey.
* ABC of clinical genetics by H.M Kingston.

**Pathology**

* Pathologic basis of disease by Vinary kumar, abul K, Abbas WB saunders.
* Pocket companion to pathologic basis of diseases,Richard Mitchall, vinary.
* General pathology by walter. Churchil livingstone.

**Pharmacology**

* Basic and clinical pharmacology by katzung, MCGraw-hill
* Pharmacology by champe and Harvey, Lippincott Williams & wilkins.

**Behavioral sciences**

* Hand book of behavioral sciences by prof Mowadat H Rana 3rd edition
* Medical and psychosocial aspects of chronic illness and disability Donna R.

**Community medicine**

* Parks textbook of preventive and social medicine, K park
* Public health and community medicine Ilyas, Ansari

**Surgery**

* Bailey & love short practice of surgery

**Medicine**

* Davidson’s principles and practice of medicine

**Islamiyat/Pakistan studies**

* Standard islamiyat (compulsory) for B.A, B.sc, M.A, M.sc by professor M. sharif islahi
* Pakistan studies (compulsory) for B.A, B.sc,B.com, Medical/Engineering by prof Shah Jahan

**End of Module/ Block examination will be conducted on ---/---/ 2025/26**