UNIVERSITY OF HEALTH SCIENCES LAHORE

UHS

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Renal – 1

Study Guide

Second Year MBBS

ISLAM MEDICAL COLLEGE

Sialkot – Pakistan

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RENAL – 1

GUIDE

MODULE LEAD DETAILS

Hello, I am Dr. Rana Muhammad Zeeshan working as an Assistant Professor in Anatomy department of Islam Medical and Dental College, Sialkot and now acting as **a Module Lead of Renal-1.** I completed my MBBS from FMH College of Medicine and Dentistry, Lahore in 2015, CHPE in 2023 from Khyber Medical University, Peshawar and MPhil Anatomy in 2024 at University of Health Sciences, Lahore. You can come to meet me in Assistant Professor office Anatomy, Academic Block 1 from 08:00 – 15:00 hours on weekdays. You can also contact me freely on my email shani3687@gmail.com.

MODULE OVERVIEW

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.

MODULE 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.

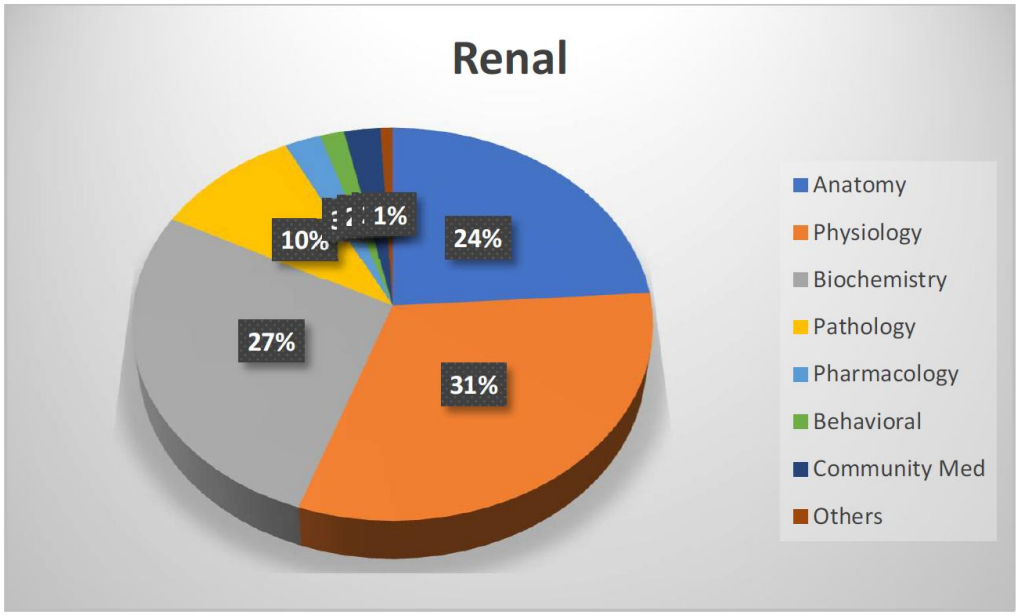
Highlight pathologies related to kidneys and their distinctive clinical features

Explain method of electrolyte balance and pathologies related to it.

Interpret investigations done to diagnose abnormal structural and functional presentations.

MODULE SCHEDULE

Module weeks	4 weeks
Recommended minimum hours	111
Start of Module	21st April, 25
Mid- Module Assessment	5th May, 25
Last Day	14th May, 25
Block Exam	19th – 21st May, 25



MODULE CONTENTS

NORMAL STRUCTURE			
THEORY			
CODE	GROSS ANATOMY	TOTAL HOURS = 14	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
R-A-001	Describe gross features and facial coverings of kidneys.	Human Anatomy	Kidney
	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	Compare and contrast the relations of right and left ureter	Human Anatomy	Ureter
	Give the constrictions of ureter		
	Describe the blood supply nerve supply and lymphatics of ureter		
	Identify the ureter.		
R-A-003	Describe the gross anatomical features, relations, surfaces, blood supply, nerve supply and lymphatics of urinary bladder	Human Anatomy	Urinary bladder
	Give the clinical corelates of urinary bladder		
	Identify the gross features and surfaces of urinary bladder		
R-A-004	Interpret basic urological signs/symptoms & investigations.	Integrate with urology	Sign/symptom/investigations
R-A-005	Describe the etiology, and management of urinary retention.		Urinary retention
R-A-006	Identify and describe the various anatomic landmarks of the renal system on radiographs.	Integrate with Radiology	radiograph
R-A-007	Describe the parts of urethra.	Human Anatomy	Urethra

CODE	EMBRYOLOGY & POST-NATAL DEVELOPMENT	TOTAL HOURS = 05	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
R-A-008	Describe development of intermediate mesoderm and its derivatives	Embryology	Development of urinary system
	Describe the development of pronephros, mesonephros and metanephros	Embryology	
	Describe positional changes during descent of kidney with correlation to its blood supply	Embryology	
	Describe the development of urinary bladder and urethra	Embryology	
	List and describe the common congenital anomalies of kidney, urinary bladder and urethra.	Embryology	
CODE	MICROSCOPIC STRUCTURE	TOTAL HOURS = 04	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
R-A-009	Describe the histological, structural organization and functions of kidney with clinicals.	Histology	Structure of kidney
R-A-010	Describe the light and ultrastructure of Juxtaglomerular apparatus and glomerular filtration barrier	Histology	Juxtaglomerular apparatus
R-A-011	Describe the histological structure of ureter	Histology	Structure of ureter
R-A-012	Describe the histological structure of urinary bladder Discuss clinical correlates (Cystitis, Urinary bladder cancer, Urinary Tract Infections (UTIs))	Histology	Structure of urinary bladder
PRACTICAL			
CODE	HISTOLOGY	TOTAL HOURS = 06	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
R-A-013	Identify and draw and label the histological structure of kidney and enumerate points of identification	Practical	Kidney

R-A-014	Identify, draw and label the histological structure of ureter and enumerate its points of identification	Practical	Ureter
R-A-015	Identify, draw and label the histological structure of urinary bladder and enumerate its points of identification	Practical	Urinary bladder
NORMAL FUNCTION			
THEORY			
CODE	**MEDICAL PHYSIOLOGY**	**TOTAL HOURS = 36**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**
R-P-001	Explain the general organization of the kidney and urinary tract Explain the physiological anatomy of the nephron	Physiology	Physiological anatomy of kedneys
R-P-002	Explain the renal blood supply		Renal Blood Supply
R-P-003	Discuss the sites and mechanism of action of different diuretics		Diuretics
R-P-004	Describe major composition of intracellular and extracellular fluids		Body fluid compartment
	Define Hypo and hypernatremia		
	Explain the causes of hypo & hypernatremia and their effects on Composition of body fluid compartments		
	Describe difference between iso-osmotic, hyper-osmotic, hypo-osmotic fluids		
R-P-005	Enumerate causes of Intracellular and extracellular edema	Integrate with Medicine	Edema
	Describe safety factors that prevent edema		
R-P-006	Explain the functions of the kidney	Physiology	Function
R-P-007	Describe the mechanism of micturition and its control		Micturition reflex
	Explain the role of higher center on micturition		
	Explain the physiological anatomy and innervation of bladder		
	Discuss the voluntary control of micturition		

R-P-008	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	Integrate with Pathology	Abnormalities of micturition
R-P-009	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	Physiology	Urine formation
R-P-010	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	Physiology	Glomerular filtration
R-P-011	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	Physiology	Reabsorption

	Discuss the characteristics of medullary collecting ducts		
R-P-012	Explain the use of clearance method to quantify kidney function	Physiology	Clearance method
R-P-013	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	Physiology	Transport maximum
R-P-014	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	Physiology	Urine concentration and dilution
R-P-015	Define and explain the term obligatory urine volume. Define and explain free water clearance. Define Urine specific gravity.	Physiology	Obligatory urine volume
R-P-016	Enumerate different abnormalities of urinary concentrating ability	Physiology	Disorders of urine concentrating ability
R-P-017	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	Integrate with Medicine	Diabetes insipidus
R-P-018	Make the flow chart to show the Osmoreceptor-antidiuretic hormone (*ADH*) feedback mechanism for	Physiology	Osmoreceptor-ADH Feedback

	regulating extracellular fluid osmolarity in response to a water deficit.		System
	Enlist the factors which increase and decrease the release of ADH		
R-P-019	Explain the mechanism of thirst		Thirst
R-P-020	Enumerate the factors that can alter potassium distribution between intracellular and extracellular fluids	Physiology	Renal regulation of potassium
	Discuss the process of secretion of potassium by renal tubules Explain the regulation of internal potassium distribution and potassium secretion		
R-P-021	Explain the control of extracellular fluid osmolarity and sodium concentration		Control of ECF osmolarity
R-P-022	Explain the integration of renal mechanism for control of Extracellular Fluid (ECF)		Control of ECF
	Explain the importance of pressure natriuresis and diuresis in maintaining body sodium and fluid balance		
R-P-023	Explain the renal handling of calcium concentration to regulate plasma calcium concentration		Renal regulation of calcium Renal regulation of phosphate
	Enumerate the factors that alter renal calcium		
	Enlist the factors that alter renal phosphate excretion		
R-P-024	Explain the nervous and hormonal factors that increase the effectiveness of renal body fluid feedback control	Physiology	Renal body fluid feedback control
R-P-025	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		ECF and blood volume
R-P-026	Explain the renal handling of H^+ ion.		Acid base balance
R-P-027	Analyze the acid base disturbances on the basis of pH, HCO3 and CO2	Physiology	Acid base disturbance

	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-028	Define and explain anion gap	Physiology	Anion gap
CODE	**MEDICAL BIOCHEMISTRY**	**TOTAL HOURS = 23**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**
R-B-001	Discuss the synthesis and degradation of purines (De-Novo and salvage pathway)	Medical Biochemistry	Purine metabolism
R-B-002	Discuss the synthesis and degradation of pyrimidine (De-Novo and salvage pathway)		Pyrimidine metabolism
R-B-003	Outline the sequence of reactions that converts IMP to AMP and GMP and to their corresponding triphosphates		Nucleotide metabolism
R-B-004	Discuss the regulation of purine and pyrimidine biosynthesis and degradation		Regulation of purine and pyrimidine
R-B-005	Interpret the Lesh-Nhyan syndrome. Gout, SCID/ADA on basis of sign symptoms and data		Purine metabolism disorders
R-B-006	Interpret Orotic aciduria in relevance to nucleotides and urea Differentiate between CPS I and II	Medical Biochemistry	Pyrimidine metabolism disorders
R-B-007	Interpret the role of synthetic analogues of nucleotides in medicine based on sign/symptoms and data e.g Methotrexate, 5 Flurouracil and Allupurinol.		Analogues of nucleotides
	Interpret the role of PABA analogs and mycophenolic acid in purine biosynthesis		

R-B-008	Discuss the role of Ribonucleotide reductase in Nucleotide metabolism (hydroxyurea)		Role of Ribonucleotide reductase
R-B-009	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.	Biochemistry/integrate with Medicine	Acid Base balance imbalance/ Types of acid base disorders
R-B-010	Interpret disorders 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	Biochemistry	Acid Base balance imbalance/ Tetany in alkalosis
PRACTICAL			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 02+10=12**	
		DISCIPLINE	**TOPIC**
R-P-029	Perform a complete examination of the urine sample URS-10 (using urine reagent-10) and interpret its report	Physiology Practical	Interpretation of report
	Determine the specific gravity of urine		
R-B-011	Estimate blood urea, creatinine & creatinine clearance and interpret the results.	Biochemistry Practical	Interpretation of results

	Determination of proteins in urine by dipstick method and by chemical methods and interpret your results.		
	Estimate serum uric acid by kit method		
PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 14**	
		DISCIPLINE	**TOPIC**
R-Ph-001	Classify diuretics & carbonic anhydrase inhibitor. MOA, clinical uses, and adverse effects	Pharmacology & Therapeutics	Diuretics
	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.		
R-Pa-001	Discuss the etiology and pathogenesis of different types of stones.	Pathology	Renal Stones
R-Pa-002	Identify the causes, morphological aspect & outcome of hydronephrosis.		Hydronephrosis
R-Pa-003	Define pyelonephritis and enumerate its types. Describe the morphological features of acute and chronic pyelonephritis		Pyelonephritis
R-Pa-004	Define acute and chronic cystitis. Describe morphological features of different types of cystitis.		Cystitis
R-Pa-005	Enlist common causative agents of urinary tract infections and describe pathogenesis and clinical features of common causative agents of UTI.	Microbiology	UTI causative agents
R-Pa-006	Define various presentations of glomerulonephritis. Define nephrotic and nephritic syndrome. List various risk factors and outline management of glomerulonephritis.	Integrate with Medicine	Glomerulonephritis

R-Pa-007	Define AKI (acute kidney injury) Identify various risk factors and causes for AKI. Outline management strategies.		Acute Kidney Injury
R-Pa-008	Define UTI (Urinary Tract Infection)		Urinary tract infection
	Identify various risk factors and causes of UTI.		
	Describe signs and symptoms of UTI.		
	Outline management strategies.		

PRACTICAL

CODE	PATHOLOGY	TOTAL HOURS = 01	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
R-Pa-009	Identify morphological features of acute pyelonephritis Identify morphological features of Chronic pyelonephritis	Pathology	Pyelonephritis

DISEASE PREVENTION AND IMPACT

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 04	
		DISCIPLINE	TOPIC
R-CM-001	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.	Community Medicine and Public Health	Quality of life
R-BhS-001	To identify the behavioral abnormalities caused by renal function.	Behavioral Sciences	Dementia, uremic encephalopathy, delusion, muscle paralysis & Societal impact
	To identify the cognitive abnormality.		
	To identify the dangers for the patient, his family, and society.		

AGING

CODE	THEORY	TOTAL HOURS = 02	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC

R-Ag-001	To define preventive care in diseases related to urinary system(adults). Primary, secondary, and tertiary prevention.	Community	Disease prevention
R-Ag-002	Define urinary incontinence. Outline management strategies.	Medicine	Urinary incontinence

WEEKLY TIMETABLES

Renal Module Schedule (2nd Year MBBS)								
WEEK- 01/04								
Day/Date	8:00 - 10:00		10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40	1:40 - 3:00
Monday 21st April 2025	End-Module Assessment		Physio LGIS	Embryo LGIS	Practical (Anat, Bio, SDL)		Lunch/ Friday prayer Break	SGD (Physio/Bio)
Tuesday 22nd April 2025	Anat Dissection		Embryo LGIS	Biochem LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)
Wednesday 23rd April 2025	Anat Dissection		Physio LGIS	Biochem LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)
Thursday 24th April 2025	Anat Dissection		Physio LGIS	Physio LGIS	11:40-12:30	12:30-1:10		1:40-2:20 / 2:20-3:00
					Biochem LGIS	Com Med LGIS		PERLs / DSL (Physio)
Friday 25th April 2025	8:00-8:50	8:50-9:40	9:40-10:30	10:30-11:20	11:20-12:10	12:10-1:00		1:40 - 3:00
	Physio LGIS	Patho LGIS	Histo LGIS	Biochem LGIS	Physio LGIS	Beh LGIS		SGD (Physio/Bio)

WEEK- 02/04								
Day/Date	8:00 - 10:00		10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40	1:40 - 3:00
Monday 28th April 2025	Anat Dissection		Physio LGIS	Embryo LGIS	Practical (Anat, Bio, Patho)		Lunch/ Friday prayer Break	SGD (Physio/Bio)
Tuesday 29th April 2025	Anat Dissection		Biochem LGIS	Physio LGIS	Practical (Anat, Bio, Patho)			SGD (Physio/Bio)
Wednesday 30th April 2025	Anat Dissection		Physio LGIS	Biochem LGIS	Practical (Anat, Bio, Patho)			SGD (Physio/Bio)
Thursday 1st May 2025	Labor Day							Labor Day
Friday 2nd May 2025	8:00-8:50	8:50-9:40	9:40-10:30	10:30-11:20	11:20-12:10	12:10-1:00		1:40 - 3:00
	Physio LGIS	Patho LGIS	Histo LGIS	Biochem LGIS	Physio LGIS	Com Med LGIS		SGD (Physio/Bio)

WEEK- 03/04								
Day/Date	8:00 - 10:00		10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40	1:40 - 3:00
Monday 5th May 2025	Mid-Module Assessment		Physio LGIS	Gross Anatomy LGIS	Practical (Anat, Bio, Patho)		Lunch/ Friday prayer Break	SGD (Physio/Bio)
Tuesday 6th May 2025	Anat Dissection		Biochem LGIS	Physio LGIS	Practical (Anat, Bio, Patho)			SGD (Physio/Bio)
Wednesday 7th May 2025	Anat Dissection		Physio LGIS	Biochem LGIS	Practical (Anat, Bio, Patho)			SGD (Physio/Bio)
Thursday 8th May 2025	Anat Dissection		Physio LGIS	10:50-11:40	11:40-12:30	12:30-1:10		1:40-2:20 / 2:20-3:00
				Physio LGIS	Biochem LGIS	Patho LGIS		PERLs / DSL (Biochem)
Friday 9th May 2025	8:00-8:50	8:50-9:40	9:40-10:30	10:30-11:20	11:20-12:10	12:10-1:00		1:40 - 3:00
	Physio LGIS	Patho LGIS	Histo LGIS	Biochem LGIS	Physio LGIS	Medicine		SGD (Physio/Bio)

WEEK- 04/04								
Day/Date	8:00-9:00	9:00-10:00	10:00 - 10:50	10:50 - 11:40	11:40 - 1:10		1:10-1:40	1:40 - 3:00
Monday 12th May 2025	Physio LGIS	Physio LGIS	LGIS Patho	Biochem LGIS	Practical (Anat, Bio, SDL)		Lunch/ Friday prayer Break	SGD (Physio/Bio)
Tuesday 13th May 2025	8:00 - 10:00		Pharma LGIS	Biochem LGIS	Practical (Anat, Bio, SDL)			SGD (Physio/Bio)
	Anat Dissection							
Wednesday 14th May 2025	8:00-9:00	9:00-10:00	Patho LGIS	Biochem LGIS	11:40-12:30	12:30- 1:10		Physio LGIS
	Physio LGIS	Physio LGIS			Histo LGIS	Pharma LGIS		

ASSESSMENT TOOLS

Students will be assessed by the following methods

1. **Fortnightly Assessments**

Fortnightly assessments will be conducted on Monday.

2. **Assignments/ PBLs:**

Assignments /PBLs will be given monthly.

3. **Block exam:**

At the end of block an exam will be conducted comprising of theory (MCQs & SEQs) and practical/ OSPE content.

4. **Departmental quizzes, presentations & group projects:**

Above mentioned can be the assessment tools for different departments on their will.

YEAR-2						
Block 4 **Modules** (GIT & Nutrition-I + Renal-I)	Part I MCQs (90)	90 Marks	Practical /Clinical Examination	11 OSPE 02 OSCE 03 OSVE	Marks 88 10 42	350
	Part II SEQS (10)	50 Marks				
	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	**175**	Total	**175**		
Block 5 **Modules** (Endocrinology & Reproduction-I +	Part I MCQs (90)	90Marks	Practical /Clinical Examination	11 OSPE 02 OSCE 03 OSVE	Marks 88 10 42	350
	Part II SEQS (10)	50Marks				

Head& Neck, Special Senses)	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	**175**	Total	**175**		
Block 6 **Modules** (Neurosciences-I + Inflammation)	Part I MCQs (90) Part II SEQS (10)	90 Marks 50 Marks	Practical /Clinical Examination	11 OSPE 02 OSCE 03 OSVE	Marks 88 10 42	350
	Internal Assessment	35 Marks	Internal Assessment	35 Marks		
	Total	**175**	Total	**175**		
				Total Marks:		**1050**
Islamic Studies/ Civics and Pakistan Studies	**Islamic Studies/Civics** 3 LEQs of 20 marks each			60 Marks		**100***
	Pakistan Studies 2 LEQs of 20 marks each			40 Marks		
			Total	**100**		

MBBS 2nd Professional Block- 4

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (5 marks each observed)	OSVE (14 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	23	03	38	04	-	01	46
Normal Function	Physiology applied/clinical	18	02	28	03	-	01	38
	Biochemistry applied/clinical	22	03	37	02	-	01	30
Disease Burden & Prevention	Community Medicine & Public Health	06	-	06	-	-	-	-
	Behavioral Sciences	05	-	05	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	11	01	16	01	-	-	08
	Pharmacology	05	01	10	01	-	-	08
CFRC	CF-2	-	-	-	-	01	-	05
PERLs	PERLs-2	-	-	-	-	01	-	05
Total		**90**	**10x5=50**	**140**	**11 stations x 08 = 88**	**02 stations x 05 = 10**	**03 stations x 14=42**	**140**

RECOMMENDED SOURCES

Anatomy

- Snell's Clinical Anatomy 10th ed.
- Langman's Medical Embryology 12th ed
- Medical Histology by Laiq Hussain Siddiqui 8th edition.
- General Anatomy by Laiq Hussain Siddiqui 6th edition.

Biochemistry

- Harpers illustrated Biochemistry (latest edition). Rodwell.V.W MCGrawHill publishers.
- Lippincott illustrated Review (latest edition). Kluwer.W.
- Essentials of Medical Biochemistry vol 1&2 by Mushtaq Ahmed.

Pathology

- Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders.
- Robbins and Cotran Pathological Basis of Disease. Kumar, V., Abbas, A. and Aster, J. Latest Edition
- Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pocket
- Companion to Pathologic basis of diseases, Saunder Harcourt.
- Walter and Israel. General Pathology. Churchill Livingstone.
- Robbins & Kumar, Medical Microbiology and Immunology Levinson.

General Medicine

- Principles and Practice of Medicine by Davidson (latest edition)
- Clinical Medicine by Parveen J Kumar & Michaell Clark
- Oxford Handbook of Medicine
- Macleod's Clinical Examination book
- Medicine and Toxicology by C.K. Parikh
- Hutchison's Clinical Methods by Michael Swash. 21st edition

Pharmacology And Therapeutics

- Katzung and Trevor's Pharmacology: Examination and Board Review- 15th Edition
- Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 16th Edition-
- Current Medical Diagnosis and Treatment- reference book –Edition-2024
- Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 15th Edition
- Basic and Clinical Pharmacology by Katzung, McGraw-Hill. 16th Edition.
- Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins 8th Edition.
- Katzung Basic and Clinical pharmacology, Lippincot Illustated reviews.
- Clinical Pathology Interpretations by A. H. Nagi

Behavioural Sciences

- Handbook of Behavioural Sciences by Prof. Mowadat H.Rana, 3rd Edition
- Medical and Psychosocial aspects of chronic illness and disability 6th edition by Donna R.Falvo and Beverely E.Holland,
- Integrating behavioral sciences in healthcare, Asma Humayun,2003, 1st edition

Community medicine

- Parks Textbook of Preventive and Social Medicine. K. Park
- Public Health and Community Medicine by Ilyas Ansari
- MSDS manual of Government of Punjab
- Text book of Community Medicine by Park J E. Latest Edition

Surgery

- Bailey & Love's Short Practice of Surgery (latest edition)
- Browse's Introduction to the Symptoms & Signs of Surgical Disease 4th Edition
- Bailey & Love Short Practice of Surgery, Clinical Surgery pearls by Dayananda Babu RACS for Surgical Audits.

Patent Safety

- Patient Safety Currciulum Guide: Multi Professional Guide

Microbiology

- Levinson's review of Microbiology
- Medical Microbiology and Immunology by Levinson and Jawetz

Pediatrics Medicine

- Nelson Textbook of Pediatrics
- Basis of Pediatrics by Pervez Akbar Khan

Gynecology

- Gynecology by Ten Teachers

Infection Control

- National Guidelines Infection Prevention and control, National Institute of Health Pakistan Biosafety
- Biosafety in Microbiological and Biomedical Laboratories, 6th Edition (CDC, USA)
- WHO Laboratory Biosafety Manual, Fourth Edition, And Associated Monographs
- WHO safe management of wastes from healthcare facilities chapter 7 -8 page 77-99, 105-125)

Family medicine

- Oxford Handbook of General Practice, 5th Edition

Orthopedics

- Apley and Solomon's System of Orthopaedics and Trauma by Ashley Blom (Editor) Rheumatology
- Davidson's Principles and Practice of Medicine
- Clinical Medicine by Parveen J Kumar & Michaell, Clark

- Hutchison's Clinical Methods by Michael Swash

Radiology

- Aids to Radiological Differential Diagnosis by Chapman S. and Nakielny R. 4th edition. Elsevier Science Limited; 2003.

Forensic Medicine

- Knight's Forensic Pathology by Barnard Knight 3rd edition
- G. Principles and Practice of Forensic Medicine by Prof. Nasib R. Awan,2nd edition
- Forensic DNA Typing – 2nd Edition, Author: John M. Butler
- Parikh's Text book of Medical Jurisprudence, Forensic Medicine and Toxicology by C.K. Parikh 6th Ed., CBS Publisher.
- Gun Shot Wounds 2nd edition by V.J.Deimaio
- Knight B. Simpson's Forensic Medicine.
- Knight and Pekka. Principles of Forensic Medicine

Forensic Pathology

- Forensic pathology 2nd edition by V.J.Deimaio CRC press Boca Raton London New York Washington DC

Toxicology

- Principles of clinical toxicology 3rd edition Thomas . Gossel CRC press Taylor and Francis group

Forensic Sciences

- Fundamentals of Forensic Science- 3rd Edition: Author: Max M Houck, Jay A. Siegel
- Text Book of forensic medicine and toxicology Principles and Practice 5th edition by Krishan Vig

Biomedical ethics

- Principles of Biomedical ethics, 8th edition by Tom. L. Beauchamp, James F. Childress.

Evidence Based Medicine

- Databases for the latest articles/manuscripts
- Clinical Practice Guidelines- local and international - (within last 3 years)
- Books (Latest edition-within last 5 years)

Pediatrics

- Nelson's Book of Pediatric 22 edition Illustrated book of Pediatrics, Pervaiz Akbar textbook peads medicine

Islamiyat

- Standard Islamiyat (compulsory) for B.A, BSc, MA, MSc, MBBS by Prof M Sharif Islahi.
- IImi Islamiyat(compulsory) for BA, BSc & equivalent.

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IMPORTANT NOTE

To be able to sit in Annual Exam

85 % attendance and at least 50 % in internal assessment is mandatory

DISCLAIMER

This module guide may be subject to changes, and students should stay updated through official communication channels