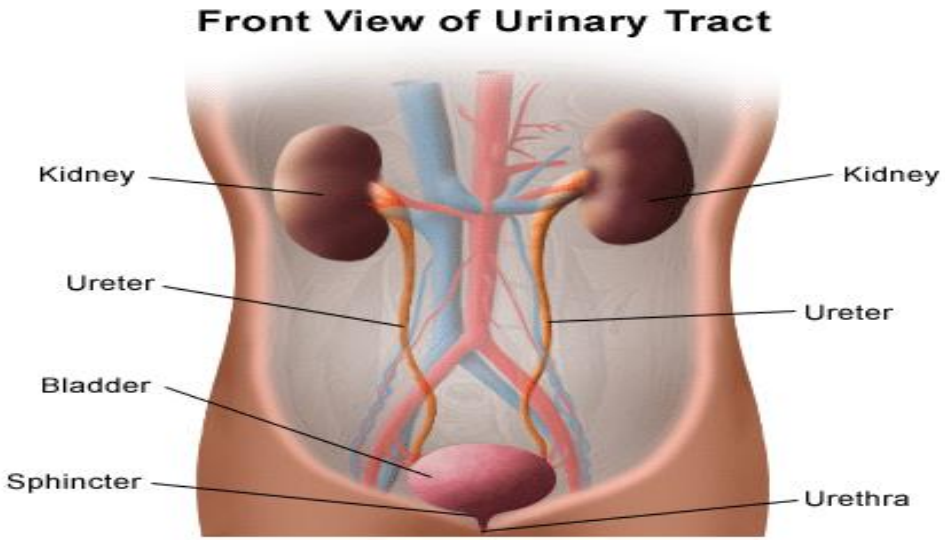
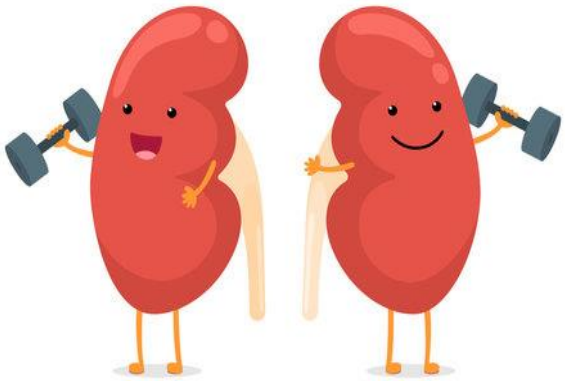




RENAL MODULE

4TH YEAR STUDY GUIDE

This Study guide of the module/course outlines the key components and areas for the facilitation of the students.
Department of Medical Education

Contents

Vision and Mission of KGMC

Khyber Medical University: Vision

Khyber Medical University will be the global leader in health sciences academics and research for efficient and compassionate health care.

Khyber Girls Medical College: Vision

"Excellence in health care, research, teaching and training in the service of Humanity"

Khyber Girls Medical College: Mission

The mission of KGMC is to promote compassionate and professional health care leaders Who are knowledgeable, skillful, and community oriented lifelong learners serving humanity through evidence based practices.

Curriculum Committee KGMC

Chair:

Professor Dr.Zahid Aman , Dean KGMC.

Co-Chair:

Dr. Ameer Mohammad, Associate Dean KGMC.

Clinical Sciences:

- Dr Mohammad Noor Wazir ,Department of Medicine KGMC/HMC
- Dr. Said Amin Department of Medicine KGMC/HMC.
- Dr. Sofia Iqbal, Department of Ophthalmology KGMC/HMC.
- Dr. Ghareeb Nawaz Department of ENT KGMC/HMC.
- Dr. Bushra Rauf Department of Gynae KGMC/HMC.
- Dr. Jamshed Alam Department of Surgery KGMC/HMC.
- Dr. Ambreen Ahmad, Department of Pediatrics KGMC/HMC.
- Dr. Ain-ul-Hadi Department of Surgery KGMC/HMC.
- Dr. Fawad Rahim Department of Medicine KGMC/HMC.

Behavioral Sciences:

- Dr. Ameer Abbas Department of Psychiatry KGMC/HMC.

Medical Education

- Dr. Naheed Mahsood, Department of Medical Education, KGMC.
- Dr. Naveed Afzal Khan, Department of Medical Education, KGMC.
- Dr. Khurram Naushad, Department of Medical Education, KGMC

Basic Sciences:

- Dr. Khalid Javed Department of Pathology, KGMC.
- Dr. Zubia Shah Department of Physiology, KGMC.
- Dr. Amin-ul-Haq Department of Biochemistry, KGMC.
- Dr. Naheed Siddique Department of Forensic Medicine, KGMC.
- Dr. Shams Suleman Department of Pharmacology, KGMC.
- Dr. Raheela Amin Department of Community Medicine, KGMC.
- Dr. Shahab-ud-Din, Department of Anatomy, KGMC.

Outcomes of the curriculum:

The Curricular Outcomes of the MBBS Program for a Graduating Doctor according to the PMDC are as follows:

1. Knowledgeable

Knowledgeable about the diseases and health conditions prevalent in the population of Pakistan and use Evidence-based medicine to provide best possible cost-effective care.

2. Skillful

Skillful in History taking and Physical examination to compassionately deal with a patient.

3. Community health promoter

Take appropriate decisions and actions for protecting and promoting the health of their community.

4. Critical Thinker

Evaluate critically the patient data to effectively deal with complexity of medical decisions for the best possible outcomes using evidence-based practices in service of humanity.

5. Professional

Display professional values (honesty, accountability, cultural and religious sensitivity), attitudes and behaviors (empathy, ethics, good communication skills and lifelong learner) that embody good medical practice.

6. Researcher

Exhibit a spirit of inquisitiveness, inventiveness, and ethical conduct while carrying out research in accordance with the prescribed guidelines.

7. Leader and role Model

Demonstrate exemplary conduct and leadership in Advancing healthcare, enhancing medical education, and Enhancing the trust of the public in the medical profession by being exceptional role models.

KNOWLEDGE

By the end of five year MBBS program the KGMC student should be able to;

1. Acquire a high level of clinical proficiency in history taking, physical examination, differential diagnosis, and the effective use of medicine's evolving diagnostic and procedural capabilities including therapeutic and palliative modalities
2. Manage the common prevalent diseases in community
3. Identify the common medical emergencies
4. Develop plan for prevention of common community diseases
5. Formulate a referral plan
6. Compose a prescription plan

PSYCHOMOTOR

By the end of five year MBBS program the KGMC student should be able to;

1. Demonstrate the ability to perform the disease specific relevant examination
2. Respond to common medical emergencies
3. Master the skill of first aid
4. Perform BLS
5. Apply the best evidenced practices for local health problems

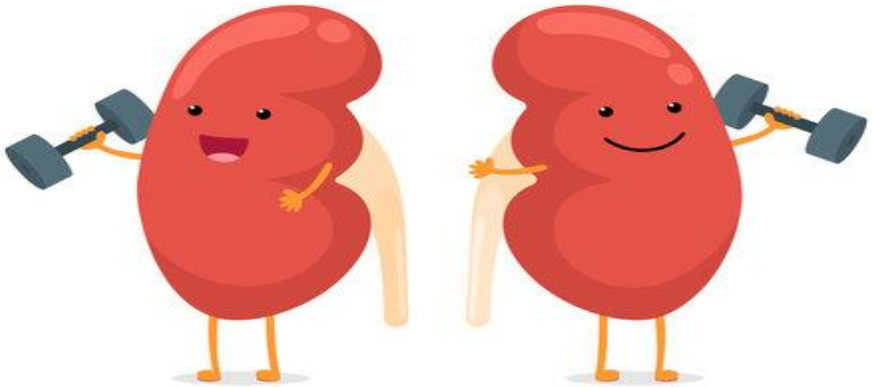
AFFECTIVE

By the end of five year MBBS program the KGMC student should be able to

1. Relate to patient and careers vulnerability
2. Demonstrate ethical self-management
3. Counsel and educate patients and their families to empower them to participate in their care and enable shared decision-making.
4. Display compassion with patient and colleagues
5. Demonstrate in clinical care an understanding of the impact of psychological, social, and economic factors on human health and disease

1. Introduction to the Renal System

The urinary system, also known as the renal system or urinary tract, consists of the kidneys, ureters, bladder, and the urethra. The purpose of the urinary system is to eliminate waste from the body, regulate blood volume and blood pressure, control levels of electrolytes and metabolites, and regulate blood pH.



Themes

Table 1 : Themes

S#	Theme	Duration in Weeks
1	Facial swelling	1 week
2	Scanty Urine	2 weeks
3	Loin pain and dysuria	
4	Urinary retention	

Teaching Hours Allocation

Table 2: Hours allocation for different subjects

S. No	Subject	Hours
1	Pathology	20
2	Pharmacology	4
3	Forensic medicine	1
4	Community medicine	20
5	Medicine	9
6	Family medicine	1
7	Surgery/urology	11
8	Anatomy	2
9	Physiology	1
10	Biochemistry	1
11	Pediatrics	3
12	Gynaecology	1
13	Radiology	1
14	Research *	8**
	Total	**75**

Learning Objectives

By the end of Renal Module, 4th year MBBS students will be able to:

1) Describe applied anatomy of Urinary System with video demonstration
2) Discuss physiology of the renal system
3) Describe the different Acid-base Disorders and the Mechanism for maintaining Acid-base Balance
4) Classify the diseases involving glomeruli, tubules, interstitium, renal blood vessels, Chronic nephron loss, Cystic, urine out flow obstruction, congenital-developmental and neoplastic diseases of renal system
5) Describe the etiology, pathogenesis, clinical manifestations, diagnosis, and prognosis of the renal system diseases.
6) Perform various practical's used in laboratory diagnosis of renal diseases.
7) Describe the Pharmacology of drugs used in the treatment of Renal System Diseases.
8) Describe ethics of Organ Transplantation.
9) Describe prevalence of renal diseases.
10) Describe the clinical features of renal diseases.
11) Diagnose & manage Acute &Chronic Kidney Disease, Nephrotic, Nephritic Syndromes, Urinary Tract Infections.
12) Management of Urinary Tract Infections, Chronic Kidney Diseases & Renal Transplant patients during Pregnancy.
13) Enumerate/Describe various renal diseases primarily effecting pediatrics age group.
14) Describe pathogenesis and management of renal stones.
15) Describe pathogenesis and management of bladder outlet obstruction (BOO).

Specific Learning Objectives

Table 3: Learning Objectives Theme Wise

Theme I: Facial Swelling				
Subject	**Topic**	**Hours**	**S#**	**Learning objectives**
Anatomy	Describe applied anatomy of renal system	1	1	Discuss the gross anatomical features (internal and external) of kidney.
			2	Describe the structures entering and leaving the hilum of kidney along with their relations.
			3	Discuss the lympho-vascular supply of kidney.
Physiology	GFR	1	4	Describe glomerular filtration rate (GFR), determinants of GFR and estimation of GFR.
	Absorption of water and Solutes		5	Describe the absorption of water and solutes along different parts of nephron
Biochemistry	Acid-base Balance	1	6	Describe the mechanisms for maintaining the Acid-base Balance.
	Acid-base Disorders		7	Describe different Acid-base Disorders.

Pathology	Basic terms	1	8	Define the terms: Azotemia, uremia, Nephrotic syndrome, Nephritic syndrome, asymptomatic hematuria, rapidly progressive glomerulonephritis
			9	Acute kidney injury, chronic kidney disease, end-stage renal disease (ESRD),
			10	Renal tubular defects, Nephrosclerosis, UTI,
			11	urolithiasis, Hydronephrosis, Oncocytoma and carcinoma
			12	Describe the pathogenesis of Nephrotic and Nephritic syndrome
	Glomerular Disease	2	13	Describe the pathological responses, pathogenesis and mediators of glomerular injury
			14	Classify Glomerular diseases.
			15	Differentiate between major Primary Glomerular diseases in terms of clinicopathological features and different microscopic findings
			16	Discuss the etiologies, clinicopathological features and morphology of the diseases presenting as Nephritic syndrome and Nephrotic syndrome
			17	Explain the pathogenesis and morphology of minimal change disease
			18	Describe the etiology, pathogenesis, morphology and clinical presentation of focal segmental glomerulosclerosis

			19	Describe the etiology, pathogenesis, morphology and clinical presentation of membranoproliferative glomerulonephritis
			20	Describe the etiology, pathogenesis, morphology and clinical presentation of IgA nephropathy
			21	Describe the pathogenesis, morphology of diabetic and other types of secondary nephropathies
	Acute Tubular Injury (ATI)	1	22	Define Acute Tubular Injury (ATI).
			23	Describe the etiology, clinico-pathological features and morphology of ischemic and toxic ATI.
			24	Compare the pattern of tubular damage in ischemic and toxic injury
	Vascular events		25	Discuss the etiology, pathogenesis, and morphology of Nephrosclerosis, malignant hypertension and Renal Artery stenosis.
Medicine	Interpretation of urinalysis	1	26	explain various abnormalities and their interpretation and importance regarding specific diagnoses
			27	Highlight the importance of urine abnormalities in other systemic diseases apart from kidney and urogenital tract abnormalities
	Nephrotic syndrome	1	28	Define Nephrotic Syndrome.
			29	Interpret the criteria for diagnosing Nephrotic Syndrome
			30	Recognize symptoms and signs of Nephrotic Syndrome

			31	Identify the complication of nephrotic syndrome
			32	Interpret the important investigations
			33	Discuss the management plan for Nephrotic syndrome
	Nephritic syndrome	1	34	Interpret the criteria for diagnosing Nephritic Syndrome
			35	Identify symptoms and signs of Nephritic Syndrome
			36	Identify important causes
			37	Enumerate important investigations
			38	Discuss the treatment plan
	Electrolytes abnormalities • Hyponatremia • Hypernatremia • Hypokalemia • Hyperkalemia	1	39	Define Hyponatremia
			40	Discuss Types of Hyponatremias
			41	Describe clinical features
			42	Enlist/ interpret the diagnostic lab investigations
			43	Calculate the sodium deficit and free water deficit
			44	Calculate rate of sodium replacement
			45	Discuss complications
			46	Define Hypernatremia
			47	Describe clinical features
			48	Enlist diagnostic lab investigations
			49	Calculate the sodium deficit and free water deficit
			50	Calculate rate of fluid replacement
			51	Describe management plan.

			52	Define Hypokalaemia
			53	Describe clinical features
			54	Interpret diagnostic lab investigations
			55	Discuss complications.
			56	Describe/JUSTIFY management plan
			57	Define Hyperkaliemia
			58	Describe clinical features
			59	Enlist diagnostic lab investigations
			60	Discuss complications Describe management plan
Pediatrics	Acute post streptococcal glomerulonephritis (ApGN)	1	61	Define AGN and APGN
			62	Describe the pathogenesis of Nephritic syndrome
			63	Know clinical features and differential diagnosis of ApGN
			64	Describe investigations required to reach a diagnosis of ApGN
			65	Effectively describe the treatment requires for patients with ApGN
		1	66	Define nephrotic syndrome.
	Nephrotic syndrome (NS)		67	Describe pathophysiology of nephrotic syndrome
			68	Classify NS in to its subtypes
			69	Describe clinical features of NS

			70	Enumerate and describe tests required to reach diagnosis of NS
			71	Outline treatment steps in the management of NS
			72	Know the complications of NS and describe its prognosis.

Theme II: Scanty Urine				
Pathology	Renal function test	1	73	Describe the normal ranges of Blood urea, creatinine, and electrolytes
			74	Explain creatinine clearance and other radiological and biochemical renal function tests and their clinical significance
	Acute kidney injury	1	75	Explain the etiology, pathogenesis, morphology and clinical presentation and complications of acute kidney injury
	Chronic Renal Failure	1	76	Explain the etiology, pathogenesis, morphology and clinical presentation and complications of chronic renal failure.
	Interstitial and Glomerulonephritis	1	77	Explain the etiology and pathogenesis of interstitial nephritis
			78	Explain the etiology, pathogenesis, and morphology of glomerulonephritis.
Medicine	Acute Kidney Injury (AKI	1	79	Define AKI.
			80	Enlist/Interpret the criteria for diagnosing AKI
			81	Discuss/ Differentiate prerenal & post renal causes
			82	Identify symptoms and signs of AKI
			83	Identify /Interpret the important complications
			84	Enumerate/DISCUSS important investigations
			85	Construct a management plan for a patient with AKI
	Chronic Kidney Disease (CKD)	1	86	Define CKD
			87	Enlist criteria for diagnosing CKD
			88	Identify important causes
			89	Identify symptoms and signs of CKD

			90	Identify the important complications
			91	Enumerate important investigations Discuss the treatment plan
	Renal Replacement Therapy (RRT)	1	92	Define RRT
			93	Enlist the different types of RRT
			94	Identify/Enumerate important indications of dialysis
			95	Identify/Enlist the important complications of dialysis
			96	Discuss the Renal transplant
			97	Enlist and discuss the types of transplant rejection
Forensic medicine	Ethics of Organ Transplantation	1	98	Describe Ethics of Organ Transplantation
			99	Describe current legislation of HOTA (Human Organ Transplant Act)
			100	Identify loop holes in existing system of human organ transplant.
Surgery/Urology	Renal transplant surgery	1	101	Enlist diagnostic indicators of renal transplant
			102	Describe pre-requisite for successful renal transplant
			103	Discuss post renal transplant care of patient
			104	Describe common complications of renal transplant surgery
			105	Enlist immunosuppressive drugs used in Renal transplant
Family medicine	Acute renal presentations- primary care management and Red flags	1	106	Explain the etiology, clinical features and presentation of acute renal failure
			107	Describe the steps of management of a patient with anuria and oliguria

			108	Identify patients that need urgent and proper referral for specialist care in primary health with anuria and acute and chronic renal disease
Community medicine	Environmental health: Introduction	1	109	Explain the importance of environmental health
			110	Define and classify environmental degradation
	Water pollution	1	111	Define water pollution and describe its importance for health
			112	Describe the different types of water pollution as simple biodegradable, complex biodegradable and complex non-degradable
	Water quality management	4	113	Explain the importance and daily requirements of water.
			114	Describe the qualities and criteria of different sources of water including surface water, ground well, shallow well, deep well.
			115	Classify different methods of purification of water
			116	Describe natural methods of purification of water
			117	Describe physical methods.
			118	Describe chemical methods.
			119	Describe filtration methods both small scale and large scale
			120	Describe purification of water in special circumstances
			121	Enumerate different water quality parameters
			122	Describe physical parameters

			123	Describe different chemical parameters and its interpretation.
			124	Explain the permissible limits of chemical parameters.

Theme III: Loin pain and Dysuria				
Pathology	Pyelonephritis	1	125	Discuss the etiology, clinico-pathological presentation, morphology, and complications of Acute Pyelonephritis,
			126	Discuss the etiology, clinico-pathological presentation, morphology and complications of, chronic pyelonephritis
			127	Discuss the etiology, clinico-pathological presentation, morphology, and complications of drug induced nephritis
	Cystic Diseases of the Kidney	1	128	Classify the cystic diseases of Kidney.
			129	Describe the inheritance, Pathological features, Complications, and prognosis of polycystic diseases of Kidneys.
			130	Differentiate between the inheritance, pathological features, typical outcomes and clinical features of Adult and Childhood Polycystic Kidney Diseases
			131	Differentiate between the inheritance, pathological features, typical outcomes, and clinical features of Childhood Polycystic Kidney Diseases.
	Urolithiasis	1	132	Enlist the types of Renal stones.

			133	Discuss the etiology and pathogenesis of Renal stones
			134	Co-relate the occurrence of renal stones with different metabolic diseases
			135	Differentiate between the different renal stones based on frequency, predisposing factors, urine PH and morphology.
	Neoplasms of the Kidneys Renal cell carcinoma	1	136	Classify the benign and malignant tumors of the Kidney.
			137	Discuss the etiology, morphology, and prognosis of Renal cell carcinoma
	Wilm's Tumor		138	Discuss the genetics, clinico-pathological features, morphology, and prognosis of Wilm's tumor
	Diagnosis and management of renal tumors		139	Describe the various investigations to diagnose renal tumors albumin/creatinine ratio, urine for micro albumin)
			140	Discuss management of renal tumors
	Congenital anomalies of bladder	1	141	Describe the congenital anomalies of bladder and urethra
	Acute Cystitis		142	Discuss the etiology, morphology clinico-pathological features and complications of Acute
	Chronic Cystitis		143	Discuss the etiology, morphology clinico-pathological features and complications of Chronic Cystitis.

Pharmacology	Urinary Tract Infection (UTI)	1	144	Describe the clinical pharmacology of drugs used in the management of acute and chronic UTI (Co-trimoxazole, Nitrofurantoin, Cephalosporins, Amoxacillin-clavulanic acid, etc).
Community Medicine	HIV/AIDS, Syphilis	1	145	Describe HIV/AIDS considering Risk groups, pathology, Diagnosis, treatment, and Prevention
			146	Describe Syphilis in terms of causative agent, incubation period, transmission, manifestation, diagnosis treatment and prevention.
	Chlamydia, Genital warts, Gonorrhea		147	Describe Chlamydia in terms of etiology, transmission, symptoms, treatment, and prevention.
			148	Describe Genital warts in terms of causes, transmission, symptoms, treatment, and prevention.
			149	Describe Gonorrhea in terms of causes, transmission, symptoms, treatment, and prevention.
	Human Papiloma virus,		150	Describe Human Papiloma Virus (HPV) in terms of causes, types, transmission, symptoms, screening, and prevention.
Medicine	Autosomal Dominant Polycystic Kidney Disease (ADPKD)	1	151	Define ADPKD.
			152	Enlist/Interpret the criteria for diagnosing ADPKD.
			153	Identify/interpret the genetic causes.
			154	Identify/ symptoms and signs of ADPKD.
			155	Identify/Interpret the important complications.
			156	Enumerate& interpret important investigations.

			157	Construct a management plan.
	Urinary Tract Infections (UTIs)	1	158	Define UTIs.
			159	Enlist the criteria for diagnosing UTIs.
			160	Identify/Differentiate the complicated and uncomplicated UTIs.
			161	Identify symptoms and signs of UTIs.
			162	Identify the important complications.
			163	Enumerate/discuss/ interpret/ important investigations.
			164	Construct a management plan for a patient with UTI.
Radiology	Urological Investigation	1	165	Uses of plain X-ray KUB (Kidney, ureter, bladder).
			166	Discuss role of CT in Urology.
			167	Discuss role of nuclear scans.
			168	Discuss DTPA Scan, DMSA Scan, MAG 3 Scan.
			169	Investigate renal system during pregnancy.
Surgery/Urology	Kidney Stones	1	170	Enlist factors predisposing to specific stone types
			171	Discuss evaluation of stone formers
			172	Discuss clinical features and Diagnosis of renal stone
			173	Describe renal stone treatment options
	Renal trauma	1	174	Describe Initial resuscitation of renal trauma patient
			175	Classify mechanism and grading of renal trauma
			176	Discuss clinical and radiological assessment of renal trauma.
	Pelvic Ureteric junction obstruction in		177	Discuss management plan of renal trauma.
			178	Define PUJ obstruction.

	adult (PUJO)		179	Enlist etiology (congenital and acquired causes).
			180	Describe clinical presentation of PUJO.
			181	Interpret Investigations (renal ultrasound, IVU (Intravenous urography), MAG-3 renography, retrograde pyelography).
			182	JUSTIFY Management PLAN options (Endopyelotomy, Pyeloplasty).
	Anomalies of renal fusion and ascent	1	183	Describe various anomalies of renal tracts like Horseshoe kidney, Ectopic kidney, Renal agenesis, Malrotated kidney, Urinary tract duplication.
	Renal Cell Carcinoma (RCC)		184	Describe clinical presentation and investigation of RCC.
			185	Enlist Treatment of localized RCC.
			186	Construct Management of metastatic RCC.
Obs & Gynae	Asymptomatic bacteriuria	1	187	Define asymptomatic bacteriuria.
			188	Describe the effects of asymptomatic bacteriuria on pregnancy.
			189	Management plan of asymptomatic bacteriuria
	Acute symptomatic urinary tract infections		190	Define Acute Cystitis
			191	Describe effects of asymptomatic bacteriuria
			192	Plan management of Acute Cystitis in pregnancy
			193	Describe the effects of acute Pyelonephritis on pregnancy.
			194	Plan Management of acute Pyelonephritis.
Pediatrics	Urinary tract infection (UTI)	1	195	Describe the types of UTI.
			196	Discuss prevention and management of UTI in children.

Theme IV: Urinary retention				
Anatomy	Describe applied anatomy of ureters, urinary bladder, prostate and urethra	1	197	Describe gross structure of kidney, ureter, bladder, and urethra.
			198	Describe the microscopic structure of prostate
			199	Discuss the microscopic structure of urethra
Pathology	Obstructive Uropathy	1	200	Discuss the obstruction in urogenital tract at different levels.
			201	Discuss the effects of obstruction on function and morphology of kidney.
			202	Describe clinico-pathological features and morphology of Hydronephrosis
	Tumors of urinary bladder	1	203	Classify tumors of urinary bladder.
	BPH		204	Discuss the etiology, pathogenesis, morphology, staging and prognosis of urothelial (Transitional Cell) Tumors
			205	Describe pathophysiology of Benign prostatic hypertrophy and risk factors
	Carcinoma prostate		206	Describe pathogenesis, risk factors and staging.
Pharmacology	Drugs for benign prostatic hyperplasia	1	207	Classify the drugs used in the management of BPH
			208	Enlist the alpha-adrenergic blocking drugs with special reference to those having specific affinity for prostate muscle.
			209	Describe the role of alpha blockers, 5-alpha reductase inhibitors (Finasteride) and combination therapy in BPH.

			210	Enlist the adverse effects of the drugs used to treat BPH.
	Carcinoma of prostate		211	Enlist the hormonal agents used in the management of Prostatic carcinoma.
			212	Describe the mechanism of action of Gonadotropin-releasing hormone (Goserelin) and anti-androgens (Cyproterone acetate and Flutamide) in the management of Prostatic carcinoma.
			213	Enlist the anticancer chemotherapeutic agents used in the management of Prostatic carcinoma.
Community medicine	Air Pollution & air quality management	2	214	Define air pollution.
			215	Enumerate criteria pollutants.
			216	Describe the sources and limits of air pollutants.
			217	Describe the adverse effects of air pollutants on health.
			218	Explain the measures for control of air pollution
			219	Describe the global adverse effects of air pollution- ozone depletion, greenhouse effect, smog, acid rain.
	Noise pollution, radiation pollution and its control	1	220	Define noise pollution.
			221	Explain adverse effects of noise pollution on health.
			222	Describe factors effecting hearing loss.
			223	Enumerate acceptable noise standards.
			224	Discuss the measures for prevention of adverse effects of noise.

			225	Classify different types of radiations to which humans are exposed.
			226	Describe the adverse effects and preventive measure of different type of nonionizing radiations.
			227	Describe the adverse effects and preventive measure of ionizing radiations.
	Waste management	2	228	Explain the importance of waste management in health
			229	Describe management of waste [organic of human and animal origin] as per water carriage system
			230	Describe the management of waste [organic of human and animal origin] as per conservancy system
			231	Describe management of solid waste [refuse]
		1	232	Define hospital waste management
	Hospital waste management		233	Explain the importance of hospital waste management in health
			234	Classify hospital waste
			235	Know the impacts of improper hospital waste management on health
			236	Describe the methods to minimize hospital waste
			237	Describe the methods of treatment of hospital waste
			238	Explain the waste management trends in developing countries
	Disasters and health	2	239	Define disaster management

			240	Describe classification of disasters
			241	Describe the mortality & morbidity due to disaster itself & mismanagement of disaster relief activities
			242	Describe pre-disaster management
			243	Describe post disaster management in immediate, intermediate, and long-term stages.
			244	Discuss management and preventive measures from previous disasters.
			245	Describe the history of disasters in Pakistan.
Surgery/Urology	carcinoma of urinary bladder	1	246	Discuss clinical Presentation of bladder cancer.
			247	Describe diagnosis and clinical staging of bladder cancer.
			248	Construct management Plan of bladder cancer.
	Enlarged Prostate	1	249	Define IPSS (International prostate symptoms scoring) for enlarged prostate.
			250	Describe watchful waiting for enlarged prostate.
			251	Enlist medical management of BPH.
			252	Minimal invasive management of BPH.
			253	Invasive surgical surgeries
			254	TURP (transurethral resection of prostate)
			255	Open prostatectomy
	Carcinoma prostate		256	Describe clinical presentation and management
	Urinary Incontinence	1	257	Define urinary incontinence
			258	Discuss urinary incontinence

			259	Classify urinary incontinence
			260	Discuss nocturnal enuresis
			261	Enlist causes and pathophysiology
			262	Describe evaluation of incontinence
			263	Enumerate Investigation of incontinence
			264	Describe conservative treatment options surgical options
	Urethral strictures	1	265	Describe etiology, Presentation, investigation, and management of urethral stricture
	Posterior urethral valve		266	Discuss clinical presentation and management of Posterior urethral valves (PUV).

Practical work				
Pathology	Urine collection methods, physical examination of urine specimen	1.5	267	Demonstrate the procedure of urine collection, physical examination volume, color, appearance, pH of specimen.
	Microscopic examination of centrifuge specimen		268	Perform the physical examination of urine and prepare report of an abnormal urine with pyuria and hematuria Interpret the results.
	Chemical examination of non-centrifuged urine specimen	1.5	269	Demonstrate substances for chemical examination and the different procedures of detection of protein in urine.
			270	Demonstrate the Principle of protein detection by heat method in urine
			271	Perform the heat and acetic acid test and the test for Bence Jones protein. Interpret the results
			272	Demonstrate the tests for detection of reducing substances in urine and the principle of Benedict's test
			273	Perform the Benedict's test. Interpret the results

			274	Demonstrate the substances seen in urine under microscope i.e. cells (Pus cells, RBCs, Epithelial cells and other different cells), Crystals, castes etc
			275	Prepare the sediment for urine examination.
			276	Detect various substances in a slide prepared from sediment under the microscope Interpret the results.
	Urine staining, and culture	1.5	277	Demonstrate the Staining methods and their principles for urine specimens of acute and chronic UTI
			278	Identify the uropathogens shown in the slide
			279	Demonstrate sterilized methods for collections of specimens for culture and sensitivity.
			280	Perform a practical for culture and sensitivity by disc diffusion method for any uropathogen.
Pharmacology	Prescriptions for acute and chronic UTI	1.5	281	Formulate prescriptions for acute and chronic UTI
Community medicine	Incinerator / waste disposal models	1.5	282	Identify the model
			283	Explain the steps of waste disposal
	Water sources	1.5	284	Identify the model related sources of water
	Sand filters		285	Identify the model
			286	Identify its different layers and mechanism of purification

			287	Calculate the dose of bleaching powder required for disinfection of water in a domestic tank
			288	Assess the quality of water sample on the basis of physical parameters (color, turbidity, suspended particles, temperature and Ph.)
			289	Interpret the bacteriological quality of water on the basis of presumptive coliform test

Learning Resources

Table 4: Reference Textbooks

S#	Subjects	Resources
1.	Anatomy	**A. GROSS ANATOMY** 1. K.L. Moore, Clinically Oriented Anatomy **B. EMBRYOLOGY** 1. KeithL. Moore. The Developing Human 2. Langman's Medical Embryology
2.	Community Medicine	1. Community Medicine by Parikh 2. Community Medicine by M Ilyas 3. Basic Statistics for the Health Sciences by Jan W Kuzma
3.	OBGYN	1. Obstetrics by Ten Teachers, Louise C. Kenny, Jenny E. Myers 2. Gynaecology by Ten Teachers, Louise Kenny, Helen Bickerstaff 3. Hacker & Moore's Essentials of Obstetrics and Gynecology 4. Textbook of Gynecology, Rashid Latif Khan 5. Fundamentals of Gynaecology, Dr Arshad Chohan
4.	Pathology	1. Robbins & Cotran, Pathologic Basis of Disease,9 th edition. 2. Rapid Review Pathology,4 th edition by Edward F. Goljan MD
5.	Physiology	1. Textbook Of Medical Physiology by Guyton And Hall 2. Ganong's Review of Medical Physiology 3. Human Physiology by Lauralee Sherwood 4. Berne & Levy Physiology 5. Best & Taylor Physiological Basis of Medical Practice
6.	Paeds	Basis of Pediatrics (8th Edition Pervez Akbar)

Assessment Plan – 4th Year MBBS

The year-4 will be assessed in 4 blocks

1) Block-1 (Neurosciences-2 module) will be assessed in **paper-J**
2) Block-2 (GIT and hepatobiliary module) will be assessed in **paper-K**
3) Block-3 (Renal-2, Endocrine & Reproduction-2 module) will be assessed in **paper-L**
4) Block-4 (ENT and EYE modules) will be assessed in **paper-M**
5) Each written paper consists of 120 MCQs.
6) Internal assessment will be added to final marks in KMU as shown in below table.
7) In OSPE, each station will be allotted 6 marks, and a total of 120 (+10% marks of internal assessment) marks are allocated for each OSPE/OSCE examination.

4th Year MBBS Modules Assessment Plan

Theory paper	Modules	Theory marks	Internal assessment theory (10%)	OSPE/OSPE	Internal assessment OSPE/OSPE (10%)	Total Marks
Paper J	Neurosciences-2	120	13	120	13	266
Paper K	GIT & Hepatobiliary-2	120	13	120	13	266
Paper L	Renal-2, Endocrine & Reproduction-2	120	14	120	13	267
Paper M	ENT and EYE	120	13	120	13	266
Research*				20	15	35
Total Marks		**480**	**53**	**500**	**67**	**1100**

*Research viva of 20 marks will be conducted in paper-L. However, the rest of 15 marks will be decided by the concerned department internally for the contribution of the students in research project/thesis.

Assessment Blueprints

Table 5: Paper L (Renal-2, Endocrine & Reproduction-2)

Subject	Renal-2	Endocrine and Reproduction-2	Total MCQs
Community medicine	11	12	23
Pharmacology	02	13	15
Pathology	11	22	33
Forensic medicine	01	09	10
Surgery	06	03	09
Gynaecology	01	09	10
Medicine	05	09	14
Pediatrics	02	01	03
Family medicine	01	02	03
Total	**40**	**80**	**120**

Table 6: OSPE/OSCE Distribution

Subject	Viva stations	OSPE/OSCE stations	Total
Pharmacology	2	1	3
Pathology	2	2	4
Forensic medicine	2	1	3
Community medicine	2	6	10
Research viva	2**	X	
Medicine (endocrine examination)	X	1	1
Surgery (physical/local examination)	x	1	1
Total	**10**	**12**	**22**

* A minimum of 22 stations will be used in final exams. Total marks will be 120 (6 marks for each station).

**there will be 2 allocated stations for research viva (one internal and one external) at one time for which the number of marks for each station will be 10 (with a total of 20 marks) allocated for research viva plus 15 marks for conduction of research). A total of 35 marks have been allocated for thesis (research project).

Teaching and learning strategies:

The following teaching / learning methods are used to promote better understanding:

- Interactive Lectures
- Hospital / Clinic visits
- Small Group Discussion
- Skills session
- Self-Directed Study

Interactive lectures:

An interactive lecture is an easy way for instructors to intellectually engage and involve students as active participants in a lecture-based class of any size. Interactive lectures are classes in which the instructor breaks the lecture at least once per class to have students participate in an activity that lets them work directly with the material.

- The instructor might begin the interactive segment with an engagement trigger that captures and maintains student attention.
- Then the instructor incorporates an activity that allows students to apply what they have learned or give them a context for upcoming lecture material.
- As the instructor feels more comfortable using interactive techniques he or she might begin to call upon a blend of various interactive techniques all in one class period.

Hospital / Clinic visits:

In small groups, students observe patients with signs and symptoms in hospital or clinical settings. This helps students to relate knowledge of basic and clinical sciences of the relevant module.

Small group discussion (SGD):

The shy and less articulate are more able to contribute. Students learn from each other. Everyone gets more practice at expressing their ideas. A two way discussion is almost always more creative than individual thoughts. Social skills are practiced in a 'safe' environment e.g. tolerance, cooperation. This format helps students to clarify concepts acquire skills or attitudes. Students exchange opinions and apply knowledge gained from lectures, tutorials and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

Skills/Practical session:

Skills relevant to respective module are observed and practiced where applicable in skills laboratory or Laboratories of various departments.

Self-Directed learning (SDL):

Self-directed learning, which involves studying without direct supervision in a classroom/Library, is a valuable way to learn and is quickly growing in popularity among parents and students. Students' assume responsibilities of their own learning through individual study, sharing and discussing with peers, seeking information from Learning Resource Centre, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self-study.

Time tables:

The timetables for the module will be shared via Edmodo and the notice boards in advance.

1. Assessment tools:

Theoretical knowledge is tested by a written examination system constituted by multiple choice questions (MCQs). The assessment of practical knowledge involves oral, spot, or objective structured practical examinations (OSPE).

Multiple Choice Questions (MCQs):

- Multiple choice questions (MCQs) are a form of assessment for which students are asked to select the best choice from a list of answers.
- MCQ consists of a stem and a set of options. The stem is usually the first part of the assessment that presents the question as a problem to be solved; the question can be an incomplete statement which requires to be completed and can include a graph, a picture or any other relevant information. The options are the possible answers that the student can choose from, with the correct answer called the key and the incorrect answers called distractors.
- 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 the college.
- The block exam will comprise of 120 MCQs and will be compiled according to the shared blueprint.

Short Essay Questions (SEQ)

Short answer questions generally ask for brief, text-based responses and may also be referred to as *fill-in-the-blank*; or *completion* questions.

Variations of the short answer question may request a list of terms or rules in which the order is not important, or may require a numerical or formula response.

Here is some general information about short answer questions:

- Does not measure interpretation.
- Can be used to check for preciseness such as correct spelling (good when using computer grading), proper or specific names of things, especially factual knowledge, and proper creation of formulas.
- Requires specific, definite, exact information.
- Can be used to discriminate whether errors can be detected in a diagram, for example.

1. Advantages of Short Answer Questions

- Easy to write.
- Reduces possibility of guessing.
- Can have a lengthy stem such as a paragraph. (Caution: You generally should not expect an exact answer character-by-character.)
- May be easy to score if the required answer is short.

2. Disadvantages of Short Answer Questions

- It can take time to create items with complex formulas.
- Can be turned into a measure of memorization ability.
- Grading can be subjective.
- Correct responses may appear incorrect due to minor errors such as misspellings, order of words, etc.
- Difficult to machine score. Much work is being conducted in this area, but it is still in early stages of development.

Objective Structured Practical Examination (OSPE)

- The content may assess application of knowledge, or practical skills.

- Student will complete task in define 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 will be assessed by internal or external examiners.
- Unobserved will be static stations in which students will have to answer the questions related to the given pictures, models or specimens the provided response sheet.
- Rest station is a station where there is no task given, and in this time student can organize his/her thoughts.
- The Block OSCE will be comprise of 20 examined station some will be interactive viva stations other will be observed stations . The stations will be assigned according to the blueprint.

Attendance Requirement:

More than 75% attendance is mandatory to sit for the examinations.