AYUB MEDICAL COLLEGE ABBOTTABAD

RENAL I MODULE STUDY GUIDE

2ND YEAR MBBS

BLOCK: E

CLASS OF : 2023

DURATION: 3 WEEKS

STUDENT NAME

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Contents

1. Module Committee:

s.no	Name	Department	Role
1.	Prof. Dr. Umar Farooq	CEO & Dean	
2.	Prof. Dr. Irfan U. Khattak	DME	Director
	Module Team		
3.	Dr. Ruhila	Chairperson Biochemistry	Block coordinator
4.	Dr. Sarwat Abbasi	Biochemistry	Module coordinator
5.	Dr. Ayesha Awan	Biochemistry	Module coordinator
6.	Dr. Sara Jadoon	Anatomy	Member
7.	Dr. Maria Shafique	Physiology	Member
8.	Miss Ayesha Saleem Jadoon	Prime	Member

2. What Is A Study Guide?

It is an aid to Inform students how student learning program of the module has been organized, to help students organize and manage their studies throughout the module and guide students on assessment methods, rules and regulations.

2.1 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.

2.2 Module objectives.

— Provides a list of learning resources such as books, computer-assisted learning programs, weblinks, and journals, for students to consult in order to maximize their learning.
— Highlights information on the contribution of continuous on the student's overall performance.
— Includes information on the assessment methods that will be held to determine every student's performance.

2.3 Achievement of objectives.

🎯 Focuses on information pertaining to examination policy, rules and regulations.
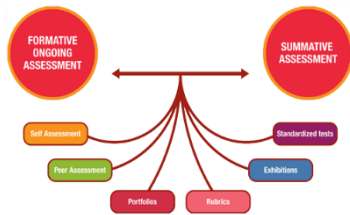
3. Recommended List Of Icons

Introduction To Case

For Objectives

Critical Questions

Assessment

Resource Material

4. Table Of Specification

TOS of Renal module (Paper- E) in GIT, Hepatobiliary, Metabolism and Renal (Block – E)

S.NO	SUBJECT	LGD NO. OF HOURS	SGD NO. OF HOURS	PERCENT DISTRIBUTION (HOURS ALLOCATED IN TT/TOTAL HOURSx100) TOTAL HOURS= 93	NO. OF MCQs	NO. OF OSPE OSPE VIVA
1	GROSS ANATOMY	5	24	31.2%	7	3
2	HISTOLOGY	3	6	9.7%	2	_
3	EMBROLOGY	3	_	3.2%	3	_
4	PHYSIOLOGY	14	6	21.5%	16	1
5	BIOCHEMISTRY	12	6	19.4%	5	2
6	PRIME(COMMUNITY MEDICINE)	4	_	4.3%	2	_
7	PATHOLOGY	1	_	1.0%	_	_
8	MEDICINE	3	_	3.2%	_	_
9	RADIOLOGY	2	_	2.2%	_	_
10	PAK.STUDIES	3	_	3.3%	_	_
11	ENT	1	_	1.0%	_	_
12	SURGERY	_	_	0%	1	_
	TOTAL	51	42	100%		

5. Organization of Renal Module:

5.1 INTRODUCTION TO BLOCK –E

Biochemistry Department of Ayub Medical College is not only responsible for Organizing, conducting and Record Maintaing of the Block E but it is also responsible to assess the students for 13 marks theory and 10 marks OSPE interal assessments in collaboration with the other two core subjects i.e. Anatomy and Physiology .

It is 10 weeks Duration and divided into 02 Modules

INTRODUCTION TO GIT, HEPATOBILIARY & METABOLISM MODULE

THEME FOR GIT, HEPATOBILIARY & METABOLISM MODULE		
TOTAL DURATION – 07 WEEKS		
S.NO	THEME	DURATION
01	Painful Swallowing	01 week
02	Abdominal Pain	01week
03	Jaundice	03 days
04	Diarrhea and Constipation	03 days
05	Bleeding Per Rectum	04 days
06	Hyperglycemia (carbohydrate Metabolism)	01 week
07	Obesity (Lipid Metabolism)	01 week
08	Wasting (Protein Metabolism)	01 week

INTRODUCTION TO RENAL MODULE

THEME FOR RENAL MODULE		
TOTAL DURATION – 03 WEEKS		
S.NO	THEME	DURATION
09	Flank Pain /Loin Pain	01 week
10	Scanty Urine /Urinary retention and Edema	01 week
11	Urinary Incontinence	eek

6. Learning Objectives

6.1 General Learning Outcomes

By the end of Renal module the students would be able to:

6.1.1   A: KNOWLEDGE:

1. Familiarize with the MBBS system based curriculum.
2. Identify & describe the various aspects of renal system in relation to its Anatomy, Physiology & Biochemistry.
3. Describe the development of renal system with Congenital anomalies.
4. Describe glomerular filteration, its autoregulation and renal blood flow.
5. Describe acid base balance and imbalance.
6. Describe the fluid compartments of the body with the regulation of intra and extracellular fluid volumes.
7. Describe pathologies related to urinary system.
8. Describe Nephrotoxic drugs, mechanism of action of diuretic drugs and mechanism of drug excretion.
9. Describe the basic concepts of –PRIME MODULE

   P – Professionalism, Patient safety & Communication Skills

   R – Research

   I – Identity formation

   M – Management & Leadership

   E – Ethics & Legal issues

6.1.2 B: PSYCHOMOTOR

1. Describe the basic laboratory techniques and use of microscope.
2. Identify basic tissues under the microscope
3. Follow the basic laboratory protocols
4. Perform biochemical analysis of a urine
5. Make and record observations accurately.
6. identify the gross anatomical features of urinary system and radiographic understanding of KUB and identification on IVU.
7. Maintain intake output charts in bedridden patients and to insert catheter..
8. To perform biochemical tests for analysis of normal and abnormal constituents of urine..
9. Able to estimate creatinine in 24h urine sample.
10. Able to analyse arterial blood gas levels.

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6.1.2   C . ATTITUDE

1. Follow the basic laboratory protocols.
2. Participate in class and practical work efficiently
3. Maintain discipline and follow the norms of the college.
4. Communicate effectively with colleagues and teachers.
5. Follow ethical rules..
6. Demonstrate the ability to reflect on the performance. .
7. Exchange opinion & knowledge
8. To equip themselves for teamwork
9. Regularly attend the classes
10. Demonstrate good laboratory practices

6.2 Specific learning objectives:

1   THEME–I: Loin pain/ Flank Pain

SNO	Subject	Topics	Learning Outcomes	MIT/hours
1	Gross anatomy	Overview of the urinary system	List and describe the main components of the urinary system	*LGD/1*

2		Kidneys	1. Discuss the location, anatomical structure, and relations of right and left kidneys to other abdominal organs
			2. Discuss the gross morphological composition of kidneys
			  • Capsule
			  • Pericapsular adipose tissue
			  • Cortex
			  • Medulla
			  • Pelvis
			  • Hilum
			  • Vascular system within kidneys
			  • Arterial supply
			  • Venous drainage
			  • Lymphatic's
			  • Innervation
			3. Enumerate the various coverings of the kidney
			4. Explain the clinical significance of coverings of the kidneys
			5. Describe the structures entering and leaving the hilum of kidney and their relationsDiscuss the location, anatomical structure, and relations of right and left kidneys to other abdominal organs
				SGD/1

3		Posterior abdominal wall	1. Describe the general features of lumbar vertebrae 2. Describe the special features of lumbar vertebrae. 3. Explain the course and relations of Abdominal Aorta.	SGD/1
4	Embryology	Development of the urinary system	Trace the embryological origins and development of the urinary system	*LGD/1*
5		Congenital anomalies of the urinary system	List and describe the common congenital anomalies of kidney and ureter.	*LGD/1*
6	Histology	Kidney	1. Describe the parenchyma of kidney 2. Enlist different components of uriniferous tubules 3. Describe Histological features of the various components of Nephron 4. Describe the histological features of renal corpuscle 5. Describe filtration barrier 6. Describe the parts of collecting tubules 7. Describe the microscopic anatomy of collecting duct 8. Enlist the components of juxtaglomerular	LGD/1/1

SNO	Subject	Topics	Learning Outcomes	MIT/hours
			apparatus	
	Physiology	Physiological Anatomy Of the kidneys and Overview of its Functions	1. States major functions of the kidneys & brief physiological anatomy of kidney. 2. Define the components of the nephron and their interrelationships: renal corpuscle, glomerulus, nephron, and collecting-duct system. 3. Draw the relationship between glomerulus, Bowman's capsule, and the proximal tubule. 4. Describe the 3 layers separating the lumen of the glomerular capillaries and Bowman's space; defines podocytes, foot processes, and slit diaphragms. 5. Define glomerular mesangial cells and states their functions and location within the glomerulus. Detail of renal vessels & Pressure within them. Describe, in general terms, the differences among superficial cortical, midcortical, and juxtamedullary nephrons. 6. location within the glomerulus. Detail of renal vessels & Pressure within them. Describe, in general terms, the differences among superficial cortical, midcortical, and juxtamedullary nephrons. 7. Define juxtaglomerular apparatus and describes its 3 cell types; states the function of the granular cells. 8. Define juxtaglomerular apparatus and describes its 3 cell types; states the function of the granular cells.	*LGD/1*
		Glomerular Filtration: Determinants and Equation	1. Describe how molecular size and electrical charge determine filterability of plasma solutes; states how protein binding of a lowmolecular-weight substance influences its filterability. 2. State the formula for the determinants of glomerular filtration rate, and states, in qualitative terms why the net filtration pressure is positive. 3. Define filtration coefficient and states how mesangial cells might alter the filtration coefficient; states the reason glomerular filtration rate is so large relative to filtration across other capillaries in the body. 4. Describe how arterial pressure, afferent arteriolar resistance, and efferent arteriolar resistance influence glomerular capillary pressure. 5. Describe how changes in renal plasma flow influence average glomerular capillary oncotic pressure. 6. State the Starling forces involved in capillary filtration. 7. State how changes in each Starling force affect glomerular filtration rate	*LGD/1*
		Nervous & Hormonal Control	1. Define renal blood flow, renal plasma flow, glomerular filtration rate, and	*LGD/1*

SNO	Subject	Topics	Learning Outcomes	MIT/hours
		of Renal Circulation	filtration fraction, and gives normal values. 2. State the formula relating flow, pressure, and resistance in an organ. 3. State the formula relating flow, pressure, and resistance in an organ. Describe the effects of changes in afferent and efferent arteriolar resistances on renal blood flow.	
		Auto regulation of GFR and renal blood flow	1. Define auto regulation of renal blood flow and glomerular filtration rate 2. Define auto regulation of renal blood flow and glomerular filtration rate.	*LGD/1*
		Review of Transport Mechanisms across the Cell Membrane(Active and Passive transport)	1. Review of Transport Mechanisms across the Cell Membrane(Active and Passive transport 2. Review of Transport Mechanisms across the Cell Membrane(Active and Passive transport 3. Describe what is meant by the expression "water follows the osmoles." 4. Describe qualitatively the forces that determine movement of reabsorbed fluid from the interstitium into peritubular capillaries. 5. Compare the Starling forces governing glomerular filtration with those governing peritubular capillary absorption. 6. Compare and contrasts the concepts of Tm and gradient-limited transport. 7. Describe 3 processes that can produce bidirectional transport of a substance in a single tubular segment; states the consequences of pump-leak systems. Contrast "tight" and "leaky" epithelia.	*LGD/1*
	Biochemistry	Acid-base balance & imbalance	1. Study the sources of Hydrogen Ion, pH & Anion Gap 2. Describe Buffer Systems operating in the Body 3. Carbonic acid,protein,and phosphate buffer 4. Carbonic acid,protein,and phosphate buffer 5. Describe Respiratory Regulation of Acid Base Balance 6. Describe Renal Regulation of Acid Base Balance Describe Disorders of Acid Base Balance: their causes, mechanisms and compensations of Respiratory Acidosis & Alkalosis and Metabolic Acidosis & Alkalosis.	*LGD/1*
	Pathology	Smoky urine	1. List the common kidney symptoms 2. Discuss the pathophysiology of renal infections 3. Describe Symptoms associated with renal pathology 4. Classify renal diseases 5. Explain Pathophysiology of renal infections	*LGD/1*

SNO	Subject	Topics	Learning Outcomes	MIT/hours
			Describe Treatment of chronic pyelonephritis	
		Renal disorders	1. Define the terms Nephrotic syndrome, nephritic syndrome, Azotemia. 2. Enlist the Causes types of renal stones. Enlist the causes and describe the pathogenesis of urinary tract infection.	*LGD/1*
		Systemic disease affecting kidneys	1. Explain how systemic diseases can affect renal function 2. Systemic diseases affecting renal function • Diabetes • Cardiovascular disorders (hypertension, CHF) • Immunological disorders (SLE, glomerulonephritis) • Cancers (myeloma) Hematological disorders (sickle cell anemia, HUS)	*LGD/1*
			PRACTICAL	
	Anatomy	Surface anatomy of the urinary system and radiology	1. Identify the gross anatomic features the kidneys, renal pelvis, ureter, urinary bladder and urethra 2. locate renal angle 3. Perform renal punch and its clinical significance 4. Develop Understanding of KUB Identify different parts of urinary system on IVU.	
	Biochemistry	Titrable acidity of urine	Find out PH of urine	

Theme-2 Edema and Urinary retention/ Scanty Urine

S#	Subject	Topic	Learning Outcomes	MIT
1	Anatomy	Ureters	1. Describe the gross anatomy of ureters 2. Describe the relations of right ureter in males and females 3. Describe the relations of left ureter in males and females 4. Highlight the clinical significance of relations of right and left ureters in both sexes 5. Discuss constrictions in ureter and their clinical relevance.	SGD/1
		Urinary bladder	1. Describe the gross structure of urinary bladder 2. Discuss the Ligaments/supports. 3. Discuss the blood supply and nerve supply of urinary bladder 4. Discuss the relations of urinary bladder in males 5. Discuss the relations of urinary bladder in females	LGD/1
		Prostate gland	1. Describe the structure of prostate gland 2. Describe Lobes, capsule, relations and structures within prostate. 3. Discuss the common problems resulting from abnormal growth of the prostate. Relate the symptoms to structures	SGD/1

S#	Subject	Topic	Learning Outcomes	MIT
		Urethra	1. Describe the gross anatomy of urethra 2. Enlist the differences between male and female urethra	SGD/1
	Embryology	Development of the urinary system (Kidney and Ureter)	1. Enlist the stages of development of kidneys 2. Describe the formation of pronephric, mesonephric and metanephric kidneys 3. Enumerate the derivatives of metanephricblastema and describe their development 4. Enumerate the derivatives of metanephric diverticulum/ureteric bud 5. Describe the changes in position and blood supply of kidneys during development 6. Enlist the various types of developmental anomalies of kidneys along with their embryological causes 7. Enlist the various types of developmental anomalies of ureters along with their embryological causes	*LGD/1*
		(Bladder and urethra)	1. Describe the development of bladder 2. Discuss the developmental anomalies of bladder 3. Describe the development of male urethra 4. Describe the development of prostate and bulbourethral glands 5. Describe the development of female urethra 6. Discuss the developmental anomalies of male and female urethra	*LGD/1*
		Prostate gland	Describe Embryological development of prostate gland	LGD/1
		Congenital anomalies of the urinary system	List and describe the common congenital anomalies of of bladder and urethra.	LGD/1
	Histology	Ureter	Describe the microscopic anatomy of ureter	LGD/1
		Bladder	Describe the histological features of urinary bladder	LGD/1
		Prostate	Describe the microscopic structure of prostate	LGD/1
		Urethra	Discuss the microscopic structure of male and female urethra	LGD/1
	Physiology	Body fluid compartments	1. List the body fluid compartments 2. Recall the volumes of body fluid compartments 3. Discuss the interplay in fluid volumes between different fluid compartments 4. Describes principles of osmosis and osmotic pressure 5. Discuss the interplay between various pressures 6. Discuss principles of edema • Intracellular fluid compartment • Extracellular fluid compartment • Intravascular fluids • Blood • Plasma	LGD/1

S#	Subject	Topic	Learning Outcomes	MIT
			• Interstitial fluid • Constituents of intra- and extracellular fluid compartments • Calculating fluid volumes • Osmosis and osmotic fluid regulation	
		Reabsorption /Secretion along Different Parts of the Nephron	1. List approximate percentages of sodium reabsorbed in major tubular segments. 2. List approximate percentages of water reabsorbed in major tubular segments. 3. Define the term iso-osmotic volume reabsorption. 4. Describe proximal tubule sodium reabsorption, including the functions of the apical membrane sodium entry mechanisms and the basolateral sodium-potassium-adenosine triphosphatase. 5. Explain why chloride reabsorption is coupled with sodium reabsorption, and lists the major pathways of proximal tubule chloride reabsorption. 6. State the maximum and minimum values of urine osmolality. 7. Define osmotic diuresis and water diuresis. 8. Explain why there is an obligatory water loss. 9. Describe the handling of sodium by the descending and ascending limbs, distal tubule, and collecting-duct system. 10. Describe the role of sodium-potassium-2 chloride symporters in the thick ascending limb. 11. Describe the handling of water by descending and ascending limbs, distal tubule, and collecting duct system	LGD/1
		mechanisms of regulation of tubular reabsorption	1. Discuss the mechanisms of regulation of tubular reabsorption • Reabsorption and secretion by the renal tubules • Active and passive transport mechanisms • Mechanism of reabsorption of specific substances (eg. • Water, electrolytes) • Reabsorption and secretion in different parts of the tubules • Glomerular balance • Peritubular and renal interstitial fluid physical forces • Effect of arterial pressure on urine output • Hormonal control of tubular reabsorption • Aldosterone • Angiotensin-II • ADH • Parathyroid hormone • Nervous regulation of tubular reabsorption	LGD/1
		Concept Of Renal Clearance	1. Define the terms clearance and metabolic clearance rate, and differentiates between general clearance and renal	LGD/1

S#	Subject	Topic	Learning Outcomes	MIT
			clearance.	
			2. List the information required for clearance calculation	
			3. State the criteria that must be met for a substance so that its clearance can be used as a measure of glomerular filtration rate; states which substances are used to measure glomerular filtration rate and effective renal plasma flow.	
			4. Predict whether a substance undergoes net reabsorption or net secretion by comparing its clearance with that of inulin or by comparing its rate of filtration with its rate of excretion.	
			5. Calculate net rate of reabsorption or secretion for any substance.	
			6. Calculate fractional excretion of any substance.	
			7. Describe how to estimate glomerular filtration rate from CCr and describes the limitations.	
			8. Describe how to use plasma concentrations of urea and creatinine as indicators of changes in glomerular filtration rate.	
		Mechanism of diluted urine formation	1. Describe the process of "separating salt from water" and how this permits excretion of either concentrated or dilute urine.	LGD/1
			2. Describe how antidiuretic hormone affects water reabsorption.	
			3. Describe the characteristics of the medullary osmotic gradient.	
			4. Explain the role of the thick ascending limb, urea recycling, and medullary blood flow in generating the medullary osmotic gradient.	
			5. State why the medullary osmotic gradient is partially "washed out" during a water diuresis	
			6. Describe the origin of antidiuretic hormone and the 2 major reflex controls of its secretion; define diabetes insipidus; state the effect of antidiuretic hormone on arterioles.	
			7. Distinguish between the reflex changes that occur when an individual has suffered iso-osmotic fluid loss because of diarrhoea as opposed to a pure water loss (ie, solute-water loss as opposed to purewater loss)	
			8. Describe the control of thirst.	
			9. Describe the pathways by which sodium and water excretion are altered in response to sweating, diarrhoea, haemorrhage, high-salt diet, and low-salt diet.	
		Mechanism of concentrated urine	Discuss the mechanism of concentrated urine formation.	LGD/1

S#	Subject	Topic	Learning Outcomes	MIT
		formation		
		Renal regulation of Potassium	1. State the normal balance and distribution of potassium within different body compartments, including cells and extracellular fluid. 2. Describe how potassium moves between cells and the extracellular fluid, and how, on a short-term basis, the movement protects the extracellular fluid from large changes in potassium concentration. 3. Describe how plasma levels of potassium do not always reflect the status of total-body potassium. 4. State generalizations about renal potassium handling for persons on high- or low-potassium diets. 5. State the relative amounts of potassium reabsorbed by the proximal tubule and thick ascending limb of Henle's loop regardless of the state of potassium intake. 6. Describe how the cortical collecting duct can manifest net secretion or reabsorption; describes the role of principal cells and intercalated cells in these processes. 7. List the 3 inputs that control the rate of potassium secretion by the cortical collecting duct. 8. Describe the mechanism by which changes in potassium balance influence aldosterone secretion. 9. State the effects of most diuretic drugs and osmotic diuretics on potassium excretion. 10. Describe the association between perturbations in acid-base status and the plasma potassium level	LGD/1
		The prostate	Discuss the physiological functions of the prostate	LGD/1
		physiochemical aspects	Discuss the physiochemical aspects (Diffusion, Adsorption, Viscosity, Colloid Osmotic pressure and role of Albumin in regulation of Osmotic pressure)	LGD/1
		Regulation of extracellular fluid osmolality and sodium concentration	1. Discuss the homeostatic function of the kidneys 2. Explain the mechanism by which kidneys are able to form diluted or concentrated urine 3. Describe Mechanism of formation of dilute urine 4. Describe Mechanism of formation of concentrated urine 5. Describe requirements for excreting a concentrated urine 6. Describe the counter-current mechanism 7. Describe Role of distal tubules and collecting ducts 8. Describe Quantifying urine concentration and dilution	LGD/1

S#	Subject	Topic	Learning Outcomes	MIT
			9. Describe Disorders of urine concentration ability	
		Regulation of extracellular fluid osmolarity and sodium concentration-2	1. Discuss the homeostatic function of the kidneys 2. Discuss the principles of osmoregulation by the kidneys 3. Explain how the body regulated the osmolarity of fluid comparts 4. Describe Control of extracellular fluid osmolarity and sodium concentration 5. Describe Osmoreceptor-ADH feedback system 6. Describe Role of thirst in controlling extracellular fluid osmolarity and concentration 7. Describe Salt-appetite mechanism and Integrated response to sodium intake	LGD/1
		Regulation of concentration of potassium, calcium, phosphate and magnesium	1. Discuss the mechanisms of regulation of concentrations of various ions in the body 2. Describe the processes occurring at cellular level to maintain/excrete various ions in the kidneys • Regulation of potassium • Regulation of calcium • Regulation of phosphate • Regulation of magnesium	LGD/1
		Short and Long term control of Blood pressure by Kidneys	1. Describe the 3 temporal domains of blood pressure control and the major mechanisms associated with them. 2. Describe the relationship between renin and angiotensin II. 3. Describe the 3 detectors that can alter renin secretion. 4. Define pressure natriuresis and diuresis. 5. Define tubuloglomerular feedback and describe the mechanism for tubuloglomerular feedback and auto regulation of glomerular filtration rate	LGD/1
	Biochemistry	Renal control of Calcium & Phosphorus	1. State the normal total plasma calcium concentration and the fraction that is free. 2. Describe the distribution of calcium between bone and extracellular fluid and the role of bone in regulating extracellular calcium. 3. Describe and compare osteocytes osteolysis and bone remodelling. 4. Describe renal handling of phosphate 5. Describe how parathyroid hormone changes renal phosphate excretion. 6.	LGD/1
		constituents of urine	Describe the normal and abnormal constituents of urine	SGD/1
	General Surgery/urology	Urinary retention	1. Describe the etiology, and management of urinary retention 2. Describe the etiology, clinical features and treatment of Benign prostatic hyperplasia	LGD/1
	Pathology	Renal failure	1. Enlist the causes of Renal failure/ uraemia and abnormalities related to micturition including incontinence	LGD/1

S#	Subject	Topic	Learning Outcomes	MIT
			2. Discuss the causes and pathophysiology of Chronic Renal failure	
		Urinary stones	Describe the pathophysiology of Urinary stones	LGD/1
		Glomerular diseases	Describe the etiology and pathogenesis of glomerulonephritis	LGD/1
		Classification of kidney disorders	Classify kidney disorders according to etiology, site of dysfunction and type of dysfunction ❖ Acute/ chronic ❖ Infectious ❖ Immunological ❖ Neoplastic ❖ Vascular/interstitial /parenchymal ❖ Primary/systemic	LGD/1
		Nephrotic syndrome	Describe Nephrotic syndrome and its etiology	LGD/1
	Pharmacology	Nephrotoxic drugs	1. Describe the mechanism of drug excretion 2. Enlist nephrotoxic drugs 3. Describe the mechanism of action of diuretic drugs	LGD/1
		Drugs acting on the renal system (in NW module it's in theme of Scanty Urine)	Classify diuretics	
	Community Medicine/Public Health	Quality of life in problems of prostate	1. Discuss quality of life issues in patients with prostate problems 2. Overview of the concept of quality of life (QoL) 3. Discuss the significance of quality of life in disease and treatment settings 4. Discuss quality of life issues in geriatric population	LGD/1
	Physiology	Intake output chart maintenance in bed ridden patients	Maintain Intake output chart maintenance in bed ridden patients	**PRACTICAL/2**
		Catheter insertion	Preform insertion of catheter on dummy	**PRACTICAL/2**
	Biochemistry	Urine analysis	Determine the normal/abnormal constituents in the urine ❖ Urine sugar ❖ Amino acids ❖ Proteins ❖ Hemoglobin ❖ Uric acid ❖ Urea ❖ Creatinine and chloride ❖ Calcium and phosphate ❖ Ammonia ❖ Ketone bodies ❖ Benzidine test for blood in urine	**PRACTICAL/2**

Theme-3 Urinary incontinence

S#	Subject	Topic		Learning Outcomes	MIT
	Anatomy	The Perineum	1.	2. Define the pelvis and the perineum Discuss the openings in the pelvis and what passes through them	SGD/1

				3. List and describe the contents of the urogenital triangle ❖ Contents of the male urogenital triangle ❖ Urethral injuries 4. Injury to the perineum in childhood	
	Physiology	Urinary bladder and micturition	1.	2. Describe the functional anatomy of urinary bladder 3. Explain the mechanism of micturition 4. Explain the micturition reflex and relate structures of the bladder with function 5. Explain basal cystometrogram 6. Describe the nervous control of bladder functions	LGD/1
		Urinary incontinence	1.	2. Discuss the causes, symptoms and management of patients with urinary incontinence, urgency, frequency, burning micturition etc 3. Causes of urinary incontinence, urgency, frequency, burning micturition 4. Terms related to urinary obstruction and incontinence 5. Describe Clinical presentation of continence disorders 6. Explain General management of incontinence	LGD/1
	Biochemistry	Water balance/metabolism	1.	2. Mechanism & regulation of Water balance 3. Disorders of water balance, such as dehydration & over hydration 4. Electrolytes (intracellular & extracellular cations) & its metabolism 5. Disorders of electrolyte metabolism	LGD/1
	Radiology	Radiological diagnosis of urinary pathologies	1.	2. Identify and describe the various anatomic landmarks of the renal system on radiographs 3. Discuss special radiological tests to determine renal function and pathologies 4. Describe normal radiographs of abdomen and pelvis 5. Describe special	LGD/1

				6. radiological tests to show renal pathology and function 6. Abdominal ultrasound	
Clinical (Nephrology/ Medicine)	Dialysis	1.		2. Describe the types, indications and the process of dialysis for kidney disease 3. Describe Types of dialysis • Peritoneal dialysis • Hemodialysis • Hemofiltration • Haemodiafiltration • Intestinal dialysis • indications for dialysis 4. Discuss disorders of acid-base balance, electrolyte abnormalities uremia or fluid overload resulting from acute and chronic renal failure, and intoxication 5. Describe The process of hemodialysis and peritoneal dialysis 6. Describe Dialyzable substances	LGD/ 1
Clinical (Nephrology/ Medicine)	Patient with excessive urination	1.		2. Discuss the disorders associated with urine concentrating ability 3. Plan a line of investigation and management in renal disorders 4. Disorders of renal concentration ability 5. Comparison of excessive urine volume with increased frequency of micturition 6. Describe the mechanism of secretion and action of ADH 7. Describe Urine concentrating ability of the various parts of the nephron Proximal convoluted tubule Descending limb of loop of Henle Ascending limb of loop of Henle Collecting system	LGD/ 1
Clinical (Nephrology/ Medicine)	Patient with continuous dribbling of urine	1.		2. Discuss the causes of urinary incontinence 3. Discuss the significance of radiological investigations in cases of urinary incontinence in children 4. Define and describe Enuresis, its causes and treatment 5. Describe Causes of urinary	LGD/ 1

				incontinence	
				6. Describe the micturition reflex 7. Discuss Tests for investigating urinary incontinence	
	Pathology	common pathologies of perineal region	1.	2. List and define the common pathologies of the perineal region 3. Describe Urethral infection	LGD/1
		PRACTICAL/2			
	Anatomy	surface anatomy of the perineum and radiology	Identification of the various structures forming the perineum on models. Identify the radiographic landmarks of the perineum		
		.Histologic examination urinary system	Identify the characteristic microscopic features of the urinary system -Kidney -Ureter -Urinary bladder -Urethra		
	Biochemistry	Creatinine in urine	Estimation of creatinine in 24 hour urine sample		
	Physiology	Arterial blood-gas analysis	Arterial blood sampling. Analysis and interpretation of arterial blood gases		

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MIT:mode of information transfer. E.g. lecture, SGD, DSL, Practical, skill lab etc etc

7. Examination and Methods of Assessment:

a. Instruction:

EXAMINATION RULES & REGULATIONS

1. Student must report to examination hall/venue,in time for smooth conduction of the exams.
2. No student will be allowed to enter the examination hall after 10 minutes of scheduled examination time.
3. No students will be allowed to sit in exam without College ID Card, and Lab Coat
4. Students must sit according to their roll numbers mentioned on the seats.
5. Student must bring their own stationary items (Pen, Pencil, Eraser, and Sharpener) –Sharing is prohibited
6. Any disturbance or Indiscipline in the exam hall/venue is not acceptable.
7. Students must not possess any written material or communicate with their fellow students
8. 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.**
9. **No student is allowed to leave the examination hall before half the time is over, paper is handed over to the examiner and properly marking the attendance**.

b. INTERNAL: total 10% (24 marks)

1. Students will be assessed comprehensively through multiple methods.
2. 10% marks of internal evaluation will be added to the KMU annual professional exam.
3. The marks distribution is based on Formative Assessment done individually by all the concerned departments. It may include:
4. Class participation and attitude of the students, class tests/ quiz, assignment, presentations, peer assessments, practicals log books and the internal exam results, all have specific marks allocation.
5. NOTE: **at least 75% attendance is mandatory** to appear in the annual university examination.

Biochemistry department is responsible to maintain the attendance record for BLOCK –E in coordination with all the concerned departments.

c. UNIVERSITY EXAM: Exam has 90% (210) marks in total

Year 2 Professional Exam in System-based Curriculum-

THEORY PAPERS	MODULES	THEORY MARKS	INTERNAL ASSESSMENT THEORY(10%)	OSPE /VIVA	INTERNAL ASSESSMENT OSPE(10%	TOTAL MARKS
PAPER-A	NS -1	120	14	90	10	234
	NS -2					
PAPER-B	GIT/LIVER	120	13	90	10	233
	RENAL					
PAPER-C	ENDOCRINE	120	13	90	10	233
	REPRODUCTION					
TOTAL MARKS		360	40	270	30	700

Paper-E (GIT, Hepatobiliary & Metabolism and Renal module) 2nd year MBBS.
Each written paper consists of 120 MCQs and internal assessment marks will be added to the final marks

Final distribution of MCQs for Renal Module 2nd year MBBS Annual University Examination

Subject	TOTAL MCQs – RENAL MODULE
Gross Anatomy	7
Histology	2
Embryology	3
Physiology	16
Biochemistry	5
PRIME including	2

Research	
Medicine	-
Pharmacology	-
Pathology	-
Community medicine	-
Pediatrics	-
Surgery	1
Total	**36**

SUBJECT	RENAL MODULE	
	OSPE	VIVA
ANATOMY	**03**	**01**
Gross Anatomy		
Histology		
Embryology		
PHYSIOLOGY	**01**	**01**
BIOCHEMISTRY	**02**	**01**

| 8. | **Learning Opportunities and Resources** |

8.1 Instruction (if any)

- Try to be regular in the classes as teacher is the best guide.
- Make your studies a primary goal as you have to deal with precious human lives.
- Stick to one book of your choice and stick the relevent high yield points from other sources to that single book of choice –it will make your examination and preps a lot easier
- Try to have as many sources of MCQ book as possible –it will help you focus on the most relevant and high yield knowledge.

8.2 Books:

CORE SUBJECTS	RESOURCES	CHAPTERS/ pages
ANATOMY	A. GROSS ANATOMY 1. Clinical Anatomy by Regions by Richard S. Snell 2. K.L. Moore, Clinically Oriented Anatomy 3. General Anatomy by BD Churissia B. HISTOLOGY 1. B. Young J. W. Health Wheather's Functional Histology C. EMBRYOLOGY 1. Keith L. Moore. The Developing Human 2. Langman's Medical Embryology B. REFERENCE BOOKS Gray's Anatomy for Students	
BIOCHEMISTRY	A. TEXTBOOKS for 2nd PROFESSIONAL 1.Lippincott's illustrated Biochemistry. 2.Pankaja Naik Or 3. Satyanarayana & Chakrapani 4.MCQ's Books & OLD PAPERS B. REFERENCE BOOKS 1. Harper's Illustrated Biochemistry 2. Textbook of medical biochemistry by Chatterjee-8thEdition 3.Lehninger Principle of Biochemistry 4. Biochemistry by Devlin	Carbohydrate Metabolism Lipid Metabolism Protein Metabolism Nutrition Digestion & Absorption Acid Base Balance Oxidative Phosphorylation.
PHYSIOLOGY	A. TEXTBOOKS 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 B. REFERENCE BOOKS 1. Guyton & Hall Physiological Review 2. Essentials Of Medical Physiology by Jaypee 3. Textbook Of Medical Physiology by InduKhurana 4. Short Textbook Of Physiology by Mrthur 5. NMS Physiology	

8.3 Other learning sources:

Hands-on Activities/ Practical	Students will be involved in Practical sessions and hands-on activities that link with the foundation and Blood modules to enhance the learning
Labs	Utilize the lab eg. Histology lab and Anatomy Museum, Biochemistry and Physiology labs. to relate the knowledge to the specimens and models available
Skill Labs	A skills lab provides the simulators to learn the basic skills and procedures. Drawing blood and different procedures at biochemistry and Physiology labs. This helps build the confidence to approach the patients
Videos	Lot of good academic high quality Videos are easily available on Youtube..
Computers Lab.	In the present day the students must be computer literate. Fortunately computer lab with internet faciliy is available on the campus. Students have the access to Digital library, various websites for articles and different topics. This can be an additional advantage to increase learning.

9. Time tables

SUBJECTS	TOPICS	TEACHER NAME	MODE OF TEACHING	VENUE
RENAL MODULE				
ANATOMY	Gross Anatomy	Dr Humaira Imtiaz	Lecture/LGD	
	Embryology	Dr Ashfaq	Lecture/LGD	
	Histology	Dr Fatima Shirin	Lecture/LGD	
	Histology Practicals	Dr Rizwana Iqbal		Histology Lab (1st Floor Biochemistry Dept)
BIOCHEMISTRY	Bioenergetics and oxidative phosphorylation	Dr. Sarwat Abbasi	Lecture/ LGD	Lecture Hall 1
	Acid Base Balance	Dr. Ayesha Awan	Lecture/ LGD	
	Practicals Details shared	Dr. Asma Rafique Dr. Maria Khan Dr Fizza Gul	Practical performance and + Scedulled SGDs	Biochemistry Lab (Ground Floor& Demo Room
PHYSIOLOGY	Renal Physiology	Dr Munazza BiBi	Lecture/LGD	
	Glomerular Filteration Nervous and hormonal control of renal circulation Body fluid compartments Mechanism of regulation of tubular reabsorption Urinary bladder and micturition with incontinence'			
	Practicals	Dr Faisal iftikhar Dr. sajjad Dr. Asfandyar Qureshi	Practical performance and + Scedulled SGDs	

AYUB MEDICAL COLLEGE ABBOTTABAD
TIME TABLE OF 2ND YEAR MBBS CLASS FOR THE SESSION 2023
RENAL MODULE: WEEK-01 : THEME –Flank Pain /Loin Pain

D A Y S	8:00-10:00				10.00- 11.00	11.00- 12.00	12.00-12.45	12.45- 1.15	1.15- 3.00
MONDAY	PRACTICAL			SDL	Biochemistry (Dr Ayesha) (LH 2) Protein-7	Physiology Dr munaza (LH 2)	(Community Medicine-2) Dr Arooj (LH 2)		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
	Histology **Biochem lab 1st floor**	**Physiology Pharmacodynamics lab**	Biochemistry **Biochem lab Ground floor**						
	A Dr Rizwana	B Dr faisal iftikhar	C Dr Fizza	D					
TUESDAY	B Dr Rizwana	D Dr asfandyar qureshi	A Dr Fizza	C	Biochemistry (Dr Nadia) (LH 2) Lipid-7	Physiology Dr shazia (LH 2)	Gross Anatomy Dr humaira imtiaz (LH 2)		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
WEDNESDAY	C Dr Rizwana	A Dr sajad	D Dr Maria	B	Biochemistry (Dr Noreen) (LH 2) CHO-7	Physiology Dr munaza (LH 2)	Histology Dr Fatima Shireen (LH 2)		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
THURSDAY	D Dr Rizwana	C Dr faisal	B Dr Asma	A	Biochemistry (Dr Ayesha) (LH 2) Protein-8	Physiology Dr shazia (LH 2)	Medicine-4 Dr Adnan (LH 2)	P R A Y E R B R E A K	D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
FRIDAY	Radiology (8:00-9:00) Dr Ghayur Khan (LH 2)			Biochemistry (9:00-10:00) (Dr ruhila) (LH-2) Nutrition-3	Embryology Dr Ishfaq (LH 2)	Pathology -7 Dr avid (LH 2)	Pak. Studies-4 Manzoor Qadir (LH 2)		**H A L F D A Y**

Prof Dr Ruhila Hanif   **ASSOCIATE DEAN (UG)**
Block -2 Coordinator Renal Module   **AYUB MEDICAL COLLEGE**
Chairperson Dept. of Biochemistry   **MTI, ABBOTTABAD**

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AYUB MEDICAL COLLEGE ABBOTTABAD
TIME TABLE OF 2ND YEAR MBBS CLASS FOR THE SESSION 2023
BLOCK -2 RENAL Module WEEK-02, Theme- Scanty urine/Urinary Retntion & Edema

D A Y S	8:00-10:00				10.00- 11.00	11.00- 12.00	12.00-12.45	12.45- 1.15	1.15- 3.00
MONDAY	PRACTICAL			Self-Directed Learning	Biochemistry (Dr Ayesha) Protein-9	Physiology Dr munaza	(Community Medicine-3) Dr Muneeba		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
	Histology Biochem lab 1st floor	Physiology Pharmacodynamics lab	Biochemistry Biochem lab Ground Floor						
	A	**B**	**C**	**D**					
	Dr Rizwana	**Dr faisal iftikhar**	**Dr Fizza**						
TUESDAY	B Dr Rizwana	D Dr asfandyar qureshi	A Dr Fizza	C	Biochemistry (Dr Nadia) Lipid-8	Physiology Dr shazia	Gross Anatomy Dr Humaira		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
WEDNESDAY	C Dr Rizwana	A Dr sajad	D Dr Maria	B	Biochemistry (Dr Noreen) (LH-2) CHO 8	Physiology Dr munaza	Histology Dr Fatma Shireen		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
THURSDAY	D Dr Rizwana	C Dr faisal	B Dr Asma	A	Biochemistry (Dr Ayesha) Acid base balance-1	Physiology Dr shazia	Surgery -4 Dr ismail	**PRAYER BREAK**	D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
FRIDAY	ENT (8:00-9:00) Dr.M.ibrahim			Biochemistry (9:00-10:00) (Dr ruhila) (LH-2) Nutrition-4	Embryology Dr Ishfaq	Pathology-8 Dr abid	Islamiyat-4 Aftab Ahmed (LH 2)		H A L F D A Y

Prof Dr Ruhila Hanif
Block -2 Coordinator Renal Module
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AYUB MEDICAL COLLEGE ABBOTTABAD
TIME TABLE OF 2ND YEAR MBBS CLASS FOR THE SESSION 2023
BLOCK -2:RENAL MODULE WEEK-3: THEME – Urinary Incontinence

D A Y S	8:00-10:00				10.00- 11.00	11.00- 12.00	12.00-12.45	12.45-1.15	1.15- 3.00
MONDAY	PRACTICAL			Computer Science / Skill Lab.	Biochemistry (Dr Ayesha) (LH 2) Acid base-2	Physiology Dr munaza (LH 2)	Medicine-5) Dr rashid (LH 2)		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
	Histology Biochem lab 1st floor	Physiology Pharmacodynamics lab	Biochemistry Biochem lab Ground Floor						
	A Dr Rizwana	B Dr faisal iftikhar	C Dr Fizza	D					
TUESDAY	B Dr Rizwana	D Dr asfandyar qureshi	A Dr Fizza	C	Biochemistry (Dr Nadia) (LH 2) Lipid-9	Physiology Dr shazia (LH 2)	Gross Anatomy Dr humaira (LH 2)		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
WEDNESDAY	C Dr Rizwana	A Dr sajad	D Dr Maria	B	Biochemistry (Dr Ayesha) (LH 2) Acid base-3	Physiology Dr munaza (LH 2)	Histology Dr Fatima (LH 2)		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
THURSDAY	D Dr Rizwana	C Dr faisal	B Dr Asma	A	Biochemistry (Dr Ayesha) (LH 2) Acid base-4	Physiology Dr shazia (LH 2)	Surgery-5 Dr behre-room (LH 2)		D I S S E C T I O N Batch A: Dental college hall -1 Batch B : Dental college hall-2 Batch C: LH-1 Batch D: GCR
FRIDAY	Islamiyat-5 8:00-9:00 Mr Aftab Ahmed (LH 2)			Pediatrics (9:00-10:00)	Medicine-6 Dr farhat	Surgery-6 Dr shahzad	Pak. Studies-5 Manzoor qadir (LH 2)	PRAYER BREAK	HALF DAY

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10. For inquiry and troubleshooting

Please contact

Associate Professor Dr Ayesha Awan -0333-7879702 ana.khyber@gmail.com

Associate Professor Dr Nadia Haleem -0322-9100036 nadiahaleem@myself.com

Assistant Professor Dr Sarwat Abbasi -0332-8901301 sarwatabbasi007@gmail.com

DEPARTMENT OF BIOCHEMISTRY –AYUB MEDICAL COLLEGE ABBOTTABAD.

11. Course Feedback Form

Course Title: _____

Semester/Module _____   Dates:_____

Please fill the short questionnaire to make the course better.

Please respond below with 1, 2, 3, 4 or 5, where 1 and 5 are explained.

_____

THE DESIGN OF THE MODLUE

A. Were objectives of the course clear to you?   Y   N☐   ☐

B. The course contents met with your expectations
        l. Strongly disagree   5. Strongly agree   ☐

C. The lecture sequence was well-planned
        l. Strongly disagree   5. Strongly agree   ☐

D. The contents were illustrated with
        l. Too few examples   5. Adequate examples   ☐

E.   The level of the course was
        l. Too low   5. Too high   ☐

F. The course contents compared with your expectations
        l. Too theoretical   5. Too empirical   ☐

G. The course exposed you to new knowledge and practices
        l. Strongly disagree   5. Strongly agree   ☐

H. Will you recommend this course to your colleagues?
        l. Not at all   5. Very strongly   ☐

_____

THE CONDUCT OF THE MODLUE

A. The lectures were clear and easy to understand
        l. Strongly disagree   5. Strongly agree   ☐

B. The teaching aids were effectively used
        l. Strongly disagree   5. Strongly agree   ☐

C. The course material handed out was adequate
        l. Strongly disagree   5. Strongly agree   ☐

D. The instructors encouraged interaction and were helpful
        l. Strongly disagree   5. Strongly agree   ☐

E. Were objectives of the course realized?   Y   N   ☐   ☐

F. Please give overall rating of the course

        90% - l00%   (   )   60% - 70%   (   )
        80% - 90%   (   )   50% - 60%   (   )
        70% - 80%   (   )   below 50%   (   )

Please comment on the strengths of the course and the way it was conducted.

_____

Please comment on the weaknesses of the course and the way it was conducted.

Please give suggestions for the improvement of the course.

Optional – Your name and contact address:

Thank you!!