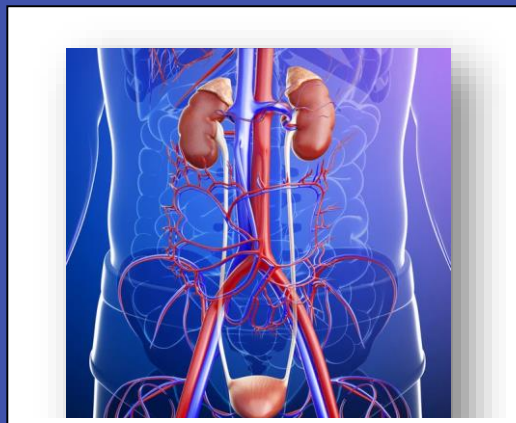


SWAT MEDICAL COLLEGE SWAT

DEPARTMENT OF MEDICAL EDUCATION



RENAL MODULE



2ND YEAR MBBS

BLOCK: E

CLASS OF : 2022-27

DURATION: 3 WEEKS

FROM: 3 JULY TO 5 AUGUST

STUDENT NAME

Contents

1	Acaedemic Calendar	2
2	List Of Abbrevation	4
3	Module Committee:	5
4	Recommended List Of Icons	6
5	Mission/ Vision of the College	7
5.1	Mission Statement of the Institution:	7
5.2	Vision Statement of the Institution:	7
6	Overview of the Module/ Preface	8
7	Introduction/ Organization of Module	9
7.1	Introduction:	9
7.2	Rationale:	9
7.3	Organization of the Study guide:	9
7.4	Teaching Strategies:	12
7.5	Assessment strategies:	12
7.6	Feedback mechanism and summary	13
8	Table Of Specification	15
9	Learning Objectives	16
9.1	General Learning Outcomes	16
9.2	Specific Learning Outcomes	17
	List of practicals	44
10	Learning Opportunities and Resources	52
11	Examination and Methods of Assessment:	53
a.	Instructions:	53
b.	The Distribution of Internal Assessment Score (10% Marks):	53
B.	Distribution of 15 Marks for Block OSPE will be as under:	54
c.	University Examination: Exam has 90% Marks	54
	BLOCK E OSPE BLUEPRINT	55
12	Tentative Timetables	56
13	For inquiry and troubleshooting	60
14	Module Evaluation Form	61
15	Students Diary/Notes	63

1 Academic Calendar

Tentative Annual Calendar MBBS – 2023-24 Swat Medical College, Swat											
Activity/ Events	Week	Date	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year				
Orientation Week	1	12 th to 16 th Feb	Foundation-I (6 weeks) 22 nd March, Module Exam	Neurosciences-IA (6 weeks) 22 nd March, Module Exam	Foundation II (5 weeks) 22 nd March, Module Exam	Neurosciences – II (6 weeks) 25 th and 26 th March Block J Exam	Previous 5th Year Preparatory leaves and annual exam				
Regular Classes	2	19 th to 23 rd Feb									
Regular Classes	3	26 th Feb to 1 st March			Blood & Immunology (5 weeks) 6 th & 7 th May Block A exam	Neurosciences-IB (5 weeks) 13 th & 14 th May Block D	Infection & Inflammation (6 weeks) 6 th May to 7 th May Block G exam	GIT and Hepatobiliary – II (9 weeks) 10 th and 11 th June Block K Exam	Foundation-III (2 weeks) 22 nd March Module Exam		
Regular Classes	4	4 th to 8 th March							Blood & Immunology-III (2 weeks) 5 th April Module Exam		
Regular Classes	5	11 th to 15 th March					MSK-I (8 weeks) 1 st & 2 nd July Block-B Exam	GIT, Hepatobiliary & Metabolism- (8 weeks) 1 st & 2 nd July	Multisystem (5 weeks) Module Exam 31 st May	Renal – II Module (4 weeks) 1 st and 2 nd July Module Exam	MSK III (2 weeks) 06 th & 07 th May Block N exam
Regular Classes	6	18 th to 22 nd March									Cardiorespiratory-III (5 weeks) 3 rd & 4 th June Block O Exam
Regular Classes	7	25 th to 29 th March	CVS-I (5 weeks) 23 rd August Module Exam	Renal (3 weeks) 12 th to 13 th August Block E					Blood & immunology (3 weeks) 1 st & 2 nd July module exam	Endocrine and Reproduction – II (8 weeks) 16 th and 17 th September Block-L exam	Renal- III Module (2 weeks) 14 th June Module Exam
Regular Classes	8	1 st to 5 th April									Endocrine & Reproduction-III (3 weeks) 20 th & 30 th July Block P Exam
Spring Break/Eid ul Fitr	9	8 th to 12 th April			Respiratory-I (4 weeks) 23 rd -24 th SEP Block-C Exam	Endocrine-I (4 weeks) 6 th Sep			CVS-II (3 weeks) 20 th September Module exam	EYE and ENT (6 weeks) 14 th to 18 th OCT BLOCK M1 & M2 Exam	Neurosciences – III (3 weeks) 16 th August Module Exam
Sports Week	10	15 th to 19 th April									GIT & Hepatobiliary (2 weeks) 6 th Sep Module Exam
Regular Classes	11	22 nd to 26 th April					PREPARATORY LEAVES	PREPARATORY LEAVES	PREPARATORY LEAVES	PREPARATORY LEAVES	Multisystem-II (4 weeks) 7 th -8 th Oct Block Q Exam
Regular Classes	12	29 th to 3 rd May									
Regular Classes	13	6 th to 10 th May									
Regular Classes	14	13 th to 17 th May									
Regular Classes	15	20 th to 24 th May									
Regular Classes	16	27 th May to 31 st May									
Regular Classes	17	3 rd to 7 th June	Annual Exam as per KMU schedule.	Annual Exam as per KMU	Annual Exam as per KMU schedule.	Annual Exam as per KMU schedule.	Annual Exam as per KMU schedule.				
Regular Classes	18	10 th to 14 th June									
Eid-ul-Adha Holidays	19	17 th to 21 st June									
Regular Classes	20	24 th to 28 th June									
Summer Vacations	21-23	3 rd to 21 st July									
Regular Classes	24	22 nd to 26 th July									
Regular Classes	25	29 th July to 2 nd Aug	Winter vacation	Winter vacation	Winter vacation	Winter vacation	Winter vacation				
Regular Classes	26	5 th to 9 th Aug									
Regular Classes	27	12 th to 16 th Aug									
Regular Classes	28	19 th 23 rd Aug									
Regular Classes	29	26 th to 30 th Aug									
Regular Classes	30	2 nd to 6 th Sep									
Regular Classes	31	9 th to 13 th Sep	Winter vacation	Winter vacation	Winter vacation	Winter vacation	Winter vacation				
Regular Classes	32	16 th to 20 th Sep									
Regular Classes/ Preparatory Leaves	33	23 rd to 27 th Sep									
Regular Classes/ Preparatory Leaves	34	30 th Sep to 4 th Oct									
Regular Classes/ Preparatory Leaves	35	7 th to 11 th Oct									
Regular Classes/ Preparatory Leaves	36	14 th to 18 th Oct									
Regular Classes/ Preparatory Leaves	37	21 st to 25 th Oct	Winter vacation	Winter vacation	Winter vacation	Winter vacation	Winter vacation				
Regular Classes/ Preparatory Leaves	38	28 th Oct to 1 st Nov									
Regular Classes/ Preparatory Leaves	39	4 th to 8 th Nov									
Regular Classes/ Preparatory Leaves	40	11 th to 15 th Nov									
Regular Classes/ Preparatory Leaves	41	18 th to 22 nd Nov									
Regular Classes/ Preparatory Leaves	42	25 th to 29 th Nov									
Regular Classes/ Preparatory Leaves	42	2 nd to 6 th Dec	Winter vacation	Winter vacation	Winter vacation	Winter vacation	Winter vacation				
Regular Classes/ Preparatory Leaves	43	9 th to 13 th Dec									
Regular Classes/ Preparatory Leaves	44	16 th to 20 th Dec									
Regular Classes/ Preparatory Leaves	45	23 rd to 27 th Dec									
Regular Classes/ Preparatory Leaves	46-49	November 2024									
Regular Classes/ Preparatory Leaves	50-53	December 2024									
Regular Classes/ Preparatory Leaves	54-57	January 2025	February 2025	February 2025	February 2025	February 2025	March 2025				
	Start of new academic session 2025-26		February 2025	February 2025	February 2025	February 2025	March 2025				

Note: The given dates are tentative and may be subject to change as needed/demanded. The KMU will share the annual exam schedule at the end of the current session.

Dear Student

The Department of Medical Education (DME) has successfully conducted faculty training for the curation of study guides. In accordance with the guidelines set by Khyber Medical University, Peshawar, this study guide has been meticulously developed by the respective block coordinator. For any queries or concerns, kindly refer to the "Query and Troubleshooting" section for contact information.

Please be advised that the timetables provided in the study guides are tentative, and the final versions will always be accessible on the official website, notice boards, and social media platforms few days earlier the start of module.

It is crucial to acknowledge that this guide is subject to continuous improvement, aligning with updates to module learning objectives and blueprints by KMU Peshawar. It is noteworthy that the learning objectives and blueprints outlined in this guide represent an enhanced and revised version of those originally provided by KMU.

For more information on modules and examination blueprints, please visit <https://kmu.edu.pk/examination/guidelines>.

Your login link of official website:
https://mis.swatmedicalcollege.edu.pk/login/student_login

2 List Of Abbrevation

Anat-SGD	Small Group Discussion in Anatomy	G.Med-L	General Medicine Lecture
Bio-L	Biochemistry Lecture	OSPE	Objectively Structured Practical Examination
Bio-P	Biochemistry Practical	Paeds-L	Pediatrics Lecture
Bio-SGD	Small Group Discussion in Biochemistry	Patho-L	Pathology Lecture
C.Med-L	Community Medicine Lecture	Phar-L	Pharmacology Lecture
DSL	Directed Self Learning	Phy-L	Physiology Lecture
FDT	Film/Demonstration/Tutorial	Phy-P	Physiology Practical
F.Med-L	Forensic Medicine Lecture	Phy-SGD	Small Group Discussion in Physiology
G.Anat-L	Gross Anatomy Lecture	SDL	Self-Directed learning
Histo-P	Histology Practical	SAQs	Short Answer Questions
MCQs	Multiple Choice Questions	SEQs	Short Essay Questions
Med.Edu-L	Medical Education Lecture	SGDs	Small Group Discussions
PRIME	Professionalism and communication skills, Research, Identity formation, Management and leadership, Ethics		

3 Module Committee:

s.no	Name	Department	Role
1.	Prof. Dr. Aziz Ahmad	Dean / principal	
2.	Dr. M Junaid Khan	DME	Director
Module Team			
3.	Prof. Dr. Rashid Ahmad	Physiology	Chairman MPC-1
4.	Assoc. Prof. Dr Humaira Ali	Anatomy	Block co-ordinator
5.	Prof. Dr. Muhammad Khan	Anatomy	Member
6.	Assoc. Prof. Dr. Obaid ur Rahman	Bio-Chemistry	Member
7.	Dr. Fiza Iqbal	Physiology	Member
8.	Asst. Prof. Dr. Amanullah	Physiology	Member
9.	Asst. Prof. Dr Sara	Bio-Chemistry	Member
10.	Dr. Ubaid Ullah	PRIME	Member
11.		Pathology	Co-opted Member
12.		Community Medicine	Co-opted Member
13.		Pharmacology	Co-opted Member



4 Recommended List Of Icons



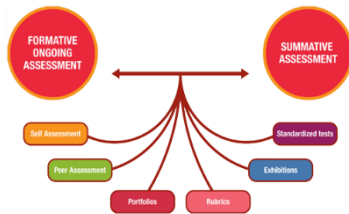
Introduction To Case



For Objectives



Critical Questions



Assessment



Resource Material

5 Mission/ Vision of the College

5.1 Mission Statement of the Institution:

To impart quality medical education through evidence based teaching incorporating professionalism, patient safety, research, critical thinking, ethics and leadership.

5.2 Vision Statement of the Institution:

To be a center of excellence in medical education, patient care and research globally.

5.3 Exit competencies/outcomes :

We need integration because we want to produce medical graduates with desirable exit competencies for a physician. Faculty of Swat Medical College has set following outcomes that by the end of the 5-year MBBS program, graduates should be able to:

1. Diagnose and treat common conditions safely, efficiently and apply knowledge of medical sciences and health principles to the ailing humanity.
2. Refer life threatening and uncommon conditions to relevant experts as soon as possible
3. Demonstrate effective communications skills with all members of the health care system
4. Demonstrate professional ethics and behaviour towards all members of the health care system
5. Demonstrate critical thinking, problem solving and decision-making skills
6. Work productively in a multi-professional system
7. Exercise basic steps to practice Evidence-based Medicine Work in a team to organize research studies
8. Demonstrate ability to be pro-active in updating his knowledge and skills and in improving professionally.



6 Overview of the Module/ Preface

Congratulations and welcome to the Block E of 2nd year MBBS, comprising of gastrointestinal and renal modules, where the overarching goal is to provide high-quality educational program for acquisition of knowledge, skills, and behaviors necessary for the future doctor. Throughout the program, emphasis is placed on integrating theoretical knowledge with practical applications, ensuring a comprehensive didactic experience. The core themes of both the modules are meticulously designed to foster an in-depth and thorough understanding of the gastrointestinal and renal systems. Students will gain hands-on experience through dissections, small group interactive sessions, case based discussions and practicals in diverse settings such as museum, dissection hall and skill labs providing a well-rounded education.

The study guide acts as an indispensable tool for the students, offering clarity on module contents, instructional methodologies, faculty guidance, and assessment criteria. It serves as a crucial reference for assessment and evaluation by clearly outlining the theory and practical components that will be assessed, along with the corresponding assessment tools, which may include MCQS, SEQS and OSPE. This transparency enables students to align their efforts with the evaluation criteria, promoting a sense of accountability and preparation for success in their academic pursuits. As future medical professionals, graduates can look forward to diverse career pathways, from clinical practice to research, with opportunities in various disciplines worldwide. In essence, by actively engaging with the information provided, students can navigate their academic journey with confidence and purpose, maximizing their learning experience in the relevant subject, ethical values and professionalism.

Being the block coordinator, I wish you all the best.



7 Introduction/ Organization of Module

7.1 Introduction:

“Renal Module” is a three-week module with three themes. Maximum effort has been made to make this module interesting and interactive, so you would be able to integrate basic sciences knowledge with clinical subjects and enjoy learning.

The urinary tract system is an integral part of body's overall maintenance as it works to maintain the homeostasis. The urinary system removes toxins from the blood and maintains the arterial blood pressure and acid-base balance of the body. It regulates the chemical composition, volume, and electrolyte balance of the blood.



The urinary system allows body to successfully filter out blood, creates urine as a waste product, then stores and excretes it. Disruption of any of its activities can lead to diseased states such as renal colic, chronic kidney disease, glomerulonephritis and nephrolithiasis

7.2 Rationale:

This module is proposed to build students basic knowledge about normal structure, organization, functions, and development of urinary system, with core knowledge of important concepts such as regulation of body fluids, fluid compartments, fluid volume and composition, electrolyte and acid-base balance and the homeostasis. In addition to Anatomy, Physiology and Biochemistry, Clinical, PRIME and behavioral sciences are also included in this module.

7.3 Organization of the Study guide:

Block E is a second block of 2nd year MBBS, with GIT and renal modules. Renal module consists of three weeks duration, with three themes, each one based on a real-life complaint and developed around common renal disorders. These themes will act as trigger to enhance the clinical relevance and will boost your problem-solving abilities.

S. No	Title of themes	Duration
1.	Flank pain/ Loin pain	1 week
2.	Scanty Urine /Urinary retention and EdemaAbdominal pain	1 week
3.	Urinary Incontinence	1 week

BLOCK FRAMEWORK: 2nd YEAR MBBS

Block D			Block E			Block F			P R E P A R A T I O N	P R O F E S S I O N A L E X A M	P R O F E S S I O N A L E X A M
Module 6	Module 7		Module 8	Module 9		Module 10	Module 11				
Neurosciences IA 7 weeks	Neurosciences IB 6 weeks	B L O C K D E X A M	GIT & Hepatobiliary 9 weeks	Renal 3 weeks	B L O C K E E X A M	Endocrinology 3 weeks	Reproduction 3 weeks	B L O C K F E X A M			

Renal Module 2nd Year MBBS								
S.No	Subjects / Disciplines	Large Group Format			Small Group Format (Batch A, Batch B, Batch C)			
		Lectures	DSLs	PBL/CPC	Practical's	SGDs	Dissection	SDLs
1.	Anatomy	16	3	1	4	8	--	5
2.	Physiology	25	3	2	6	2	--	
3.	Biochemistry	4	2	--	6	2	--	
4.	Pharmacology	2	--	--	--	--	--	
5.	Pathology	9	--	--	--	--	--	
6.	Forensic Medicine	--	--	--	--	--	--	
7.	Community Medicine	--	--	--	--	--	--	
8.	PRIME	2	--	--	--	--	--	
9.	General Medicine	5	--	--	--	--	--	
10.	Pediatrics	--	--	--	--	--	--	
11.	Ophthalmology	--	--	--	--	--	--	
12.	ENT	--	--	--	--	--	--	
13.	General Surgery	1	--	--	--	--	--	
14.	Neurosurgery	--	--	--	--	--	--	
15.	Plastic Surgery	--	--	--	--	--	--	
16.	Radiology	1	--	--	--	--	--	
18.	Pak. Study	1	--	--	--	--	--	
19.	IT	--	--	--	--	--	--	
	Sub Totals	66	8	3	16	12		
	Total Contact Hours = 107							

7.4 Teaching Strategies:

An integrated curriculum is designed to fuse different subject areas, experiences, and real-life knowledge together to make a more fulfilling and tangible learning environment for students. When you look at the time table of the module, you will find that the mode of instruction is going to be multi-pronged with small group discussions (SGD), large class format (LCF), practical & skill lab sessions.

Subject Integration

The study guide is planned to get thorough going benefit from the themes and clinical relevance to achieve the learning objectives.

Horizontal Integration: Lectures on relevant topics are horizontally integrated with other basic science subjects in year 1& 2 of the medical program

Vertical Integration: is done through clinical correlation of basic sciences through clinical lectures.

Lectures

Lecturing or large group format (LGF) teaching is didactic one-way teaching of concepts by subject expert to a large group of learners. They are an efficient means of transferring knowledge and concepts to large groups. They can be used to stimulate interest, explain concepts, provide core knowledge, and direct student learning.

Small group discussions (SGD)

Small-group discussion is a student-centered methodology, which allows students to actively involve and be partners in the teaching-learning process. Students interact with peers and instructors, discussing, and sharing ideas in a group of 6 to 10.

7.5 Assessment strategies:

Assessments within the MBBS program at STMC consist of both formative and summative evaluations. These assessments are integral to monitoring student progress and academic performance.

A. Formative Assessment:

Formative assessments, accounting for 10% of the total marks assigned to each block, serve as ongoing evaluations designed to provide feedback and facilitate learning. The allocation of this 10% can be determined in accordance with the blueprint of KMU and further distributed as per the academic council's recommendations at STMC. Formative assessments are conducted after the completion of each module, ensuring that students receive timely feedback to enhance their understanding and performance.

B. Summative Assessment:

Summative assessments, which comprise the majority of the assessment weighting (90% of all marks), are conducted and overseen by KMU, as part of the annual examination process.

The summative annual examination is organized and conducted by KMU, which carries out the evaluation and grading. This summative assessment evaluates students' comprehensive understanding of the curriculum and accounts for a significant portion of their final scores.

C. Assessment tools:

Multiple Choice Questions (MCQ)

The MCQ is a restricted response, objective assessment instrument. It contains a stem or a description of a problem, lead-in, or the question, followed by four or five options in outline format.

Short Answer Questions (SAQ)

Short answer question is an open ended, semi-structured question format. A structured, pre-determined marking scheme improves objectivity. The questions can incorporate clinical scenarios.

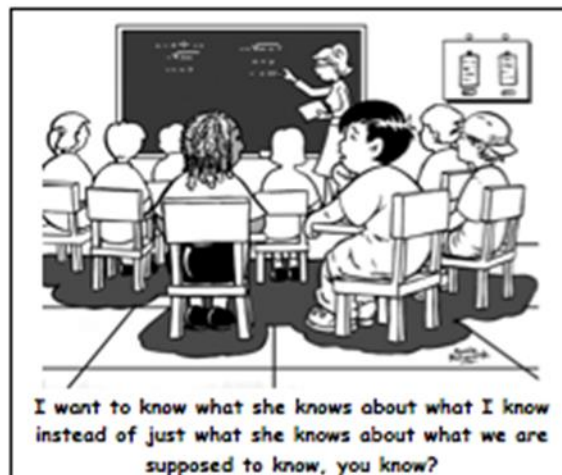
Objective Structured Clinical Examination (OSCE)

OSCE consists of multiple stations (usually 15-20) where each candidate is asked to perform a defined task such as taking a focused history or performing a focused examination of a particular system. A standardized marking scheme specific for each case is used.

7.6 Feedback mechanism and summary

Students can give written feedback of any faculty through LMS or Feedback forms at the end of a particular session or a module.

Effective Feedback, Effective Learning!



THE STUDY GUIDE:

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

COMPETENCIES:

Competencies focused in Year I and II are: -

- Medical Knowledge
- Problem solving
- Procedural skills
- Communication skills
- Empathy
- Professionalism
- Leadership and Management skills
- Research skills

OUTCOMES:

This curriculum meets the standards of Pakistan Medical Commission and our students, on completion of program will develop required competencies as defined worldwide in a graduate doctor. By the end of first year, students should be able to:

- Correlate the developmental and anatomical knowledge of cell, hematology, immunology, nerve, muscle, bone, cardiovascular and respiratory systems to their physiological and biochemical basis.
- Perform basic examination skills related to basic concepts addressed
- Comprehend the significance of behavioral science in medical education.
- Analyze multiple perspectives of Islamic studies or ethics
- Discuss the basic principles of research.

8 Table Of Specification

Subject	Weightage	No. of Hours Allocated in Time table	Assessment			
			Knowledge		Skills	
			SEQs	MCQs	OSPE	Viva BLOCK E
Gross Anatomy	13.14%	13	00	07	03	02
Histology	11.21%	12	00	04		
Embryology	3.73%	04	00	03		
Physiology	32.77%	34	00	14	01	02
Biochemistry	13.08%	14	00	08	01	02
PRIME including Research	1.86%	02	00	02	00	00
Pharmacology	1.86%	02	00	01	00	00
Pathology	8.41%	09	00	01	00	00
Community Medicine	0.93%	01	00		00	00
Forensic Medicine	00	00	00	00	00	00
Pakistan Studies	0.93%	01	00	00	00	00
General Medicine	4.67%	05	00	01	00	00
General Surgery	0.93%	01	00	01	00	00
Radiology	0.93%	01	00	00	00	00
SDL	7.47%	08	00	00	00	00
Paeds	00	00	00	00	00	00
Total	100%	107	00	42	05	06



9 Learning Objectives

9.1 General Learning Outcomes

At the end of this 3 weeks` Renal module, the 2ndYear MBBS students will be able to:

1. Describe the anatomy and development of Kidney and Urinary system.
2. Describe Histological features of the various components of Nephron and urinary system.
3. Describe functions of different parts of Nephron.
4. Discuss Glomerular Filtration and mechanisms of formation of urine.
5. What's the role of Kidney in long term control of arterial pressure?
6. Describe Mechanism & regulation of Water balance/metabolism as well as its disorders such as dehydration & over hydration.
7. Describe metabolism and renal control of Electrolytes (intracellular & extracellular cations).
8. Describe Acid Base Balance and imbalance and role of kidney in this regard.
9. Discuss the homeostatic function of the kidneys.
10. Describe renal disorders. How can systemic diseases affect renal functions?
11. Discuss quality of life issues in patients with prostate problems and overview of the concept of quality of life.

Knowledge

- Discuss about normal structure, organization, functions, and development of reproductive and urinary system.
- Explain Electrolyte, Acid-Base Balance & homeostasis and describe the regulation of body fluids, fluid compartments, fluid Volume and Composition
- Correlate the role of hypothalamic-pituitary-gonadal axis with male and female in stages of life and clinical situations

Skills

- Demonstrate effective skill for performing and interpreting various laboratory tests like pregnancy test, urine routine examination.

Attitude

- Demonstrate a professional attitude, team building spirit and good communication skill especially during small group discussions, flip classes and CBLs.
- Demonstrate ability to give and receive feedback, respect for self and peers. Demonstrate empathy and care to patients.
- Develop respect for the individuality and values of others - (including having respect for oneself) patients, colleagues and other health professionals.
- Organize& distribute tasks.
- Exchange opinion & knowledge

9.2 Specific Learning Outcomes

Theme-1 Loin pain/ Flank Pain

Introduction:

Theme-1 Loin pain/ Flank Pain has one-week duration, comprising of overview and development of the kidney and urinary system. Posterior abdominal wall with related structures are also included. Review of transport mechanisms across the cell membrane and Glomerular Filtration is part of this theme. Acid-base balance & imbalance and Renal disorders are also added.

Methods of teaching include LGF-Lectures, DSL and SGF-SGDs, Practicals, SDL.

THEME-1 LOIN PAIN/ FLANK PAIN							
S. no	Topic	Content	S. no	Learning objectives	Teaching strategies	Hour	Assessment
GROSS ANATOMY							
1	Urinary system	Overview of the urinary system	1.	List and describe the main components of the urinary system	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE
	Kidney	Gross anatomy of Kidneys	2.	Discuss the location, anatomical structure, and relations of right and left kidneys to other abdominal organs			
			3.	Discuss the gross morphological composition of kidneys Capsule Pericapsular adipose tissue Cortex Medulla Pelvis Hilum Vascular system within kidneys			

[illegible]

1	Urinary system.	Development of the urinary system	13	Trace the embryological origins and development of the urinary system	LGF/SGD	1	MCQ/SEQ/VIV A/OSPE
HISTOLOGY							
1	kidney	Histology of Kidney	15	Describe the parenchyma of kidney	LGF/SGD	2	MCQ/SEQ/VIV A/OSPE
			16	Enlist different components of uriniferous tubules			
			17	Describe Histological features of the various components of Nephron			
			18	Describe the histological features of renal corpuscle			
			19	Describe filtration barrier			
			20	Describe the parts of collecting tubules			
			21	Describe the microscopic anatomy of collecting duct			
			22	Enlist the components of juxtaglomerular apparatus			
PHYSIOLOGY							
1	Overview of the kidneys- I	Physiological Anatomy of the kidneys and Overview of	23	States major functions of the kidneys & brief physiological anatomy of kidney.	LGF/SGD	1	MCQ/SEQ/VIV A/OSPE

		its Functions-I					
			24	Define the components of the nephron and their interrelationships: renal corpuscle, glomerulus, nephron, and collecting-duct system.			
			25	Draw the relationship between glomerulus, Bowman's capsule, and the proximal tubule.			
			26	Describe the 3 layers separating the lumen of the glomerular capillaries and Bowman's space; defines podocytes, foot processes, and slit diaphragms.			
2.	Overview of the kidneys- II	Physiological Anatomy Of the kidneys and Overview of its Functions-II	27	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.	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE

			28	List the individual tubular segments in order; states the segments that comprise the proximal tubule, Henle's loop, and the collecting-duct system; defines principal cells and intercalated cells.			
			29	Define juxtaglomerular apparatus and describes its 3 cell types; states the function of the granular cells.			
			30	Define the basic renal processes: glomerular filtration, tubular reabsorption, and tubular secretion			
3.	Glomerular Filtration -I	Glomerular Filtration: Determinants and Equation	31	Describe how molecular size and electrical charge determine filterability of plasma solutes; states how protein binding of a low molecular-weight substance influences its filterability.	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE
			32	State the formula for the determinants of glomerular filtration rate, and states, in qualitative terms why the net			

				filtration pressure is positive.			
			33	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.	Glomerular Filtration-II	Glomerular Filtration Rate	34	Describe how arterial pressure, afferent arteriolar resistance, and efferent arteriolar resistance influence glomerular capillary pressure.	LGF/SGD	1	MCQ/SEQ/VIV A/OSPE
			35	Describe how changes in renal plasma flow influence average glomerular capillary oncotic pressure.			
			36	State the Starling forces involved in capillary filtration.			
			37	State how changes in each Starling force affect glomerular filtration rate			
5.	Renal Blood Flow	Nervous & Hormonal Control of	38	Define renal blood flow, renal plasma flow, glomerular	LGF/SGD	1	MCQ/SEQ/VIV A/OSPE

		Renal Circulation		filtration rate, and filtration fraction, and gives normal values.			
			39	State the formula relating flow, pressure, and resistance in an organ.			
			40	Describe sympathetic nerve supply of renal vessels & hormones affecting renal vessels			
			41	Describe the effects of changes in afferent and efferent arteriolar resistances on renal blood flow			
6.	Auto regulation of GFR and renal blood flow	Tubuloglomerular feedback mechanisms / Juxtaglomerular complex	42	Define auto regulation of renal blood flow and glomerular filtration rate	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE
			43	Describe the myogenic and tubuloglomerular feedback mechanisms of auto regulation.			
7.	Transport across the Cell Membrane	Review of Transport Mechanisms across the Cell Membrane	44	Define and state the major characteristics of diffusion, facilitated diffusion, primary active transport,	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE

		(Active and Passive transport)		secondary active transport (including symport and antiport) and endocytosis.			
8.	Body Fluid and Osmoles-I	Osmolality and Osmolarity - I	45	Define osmolality and osmolarity, and states why osmolarity is commonly used to approximate osmolality.			
			46	Describe what is meant by the expression "water follows the osmoles."			
			47	Describe qualitatively the forces that determine movement of reabsorbed fluid from the interstitium into peritubular capillaries.			
9.	Body Fluid and Osmoles-II	Osmolality and Osmolarity - II	48	Compare the Starling forces governing glomerular filtration with those governing peritubular capillary absorption.			
			49	Compare and contrasts the concepts of Tm and gradient-limited transport.			

			50	Describe 3 processes that can produce bidirectional transport of a substance in a single tubular segment; states the consequences of pump-leak systems.			
			51	Contrast "tight" and "leaky" epithelia.			
BIOCHEMISTRY							
1.	Acid-base balance & imbalance	Acid-base balance & imbalance, Buffers, Respiratory and Renal Regulation of Acid Base Balance	52	Study the sources of Hydrogen Ion, pH & Anion Gap	LGF/SGD	1	MCQ/SEQ/VIV A/OSPE
			53	Describe Buffer Systems operating in the Body			
			54	Carbonic acid, protein, and phosphate buffer			
			55	Transporting acid and mitigating pH changes			
			56	Describe Respiratory Regulation of Acid Base Balance			
			57	Describe Renal Regulation of Acid Base Balance			

			58	Describe disorders of acid base balance: their causes, mechanisms and compensations of Respiratory Acidosis & Alkalosis and Metabolic Acidosis & Alkalosis			
PATHOLOGY							
1.	Overview of Renal Diseases	Smoky urine	59	List the common kidney symptoms	LGF/SGD	1	MCQ/SEQ/VIV A/OSPE
			60	Discuss the pathophysiology of renal infections			
			61	Describe Symptoms associated with renal pathology			
			62	Classify renal diseases			
			63	Explain Pathophysiology of renal infections			
			64	Describe Treatment of chronic pyelonephritis			
2.	Renal disorders	Renal Disease/ Urinary tract infection	65	Define the terms Nephrotic syndrome, nephritic	LGF/SGD	1	MCQ/SEQ/VIV A/OSPE
			66	syndrome, Azotemia. Enlist the Causes types of renal stones.			
			67	Enlist the causes and describe the pathogenesis of			

				urinary tract infection.			
3.	Systemic diseases affecting kidneys	Renal complications of Diabetes, Hypertension and Systemic Lupus Erythematosus (SLE)	68	Explain how systemic diseases can affect renal function	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE
			69	Systemic diseases affecting renal function - Diabetes -Cardiovascular disorders (hypertension, CHF) - Immunological disorders (SLE, glomerulonephritis) -Cancers (myeloma) - Hematological disorders (sickle cell anemia, HUS)			

List of Practicals

Anatomy	Surface anatomy of the urinary system and radiology	70.	Identify the gross anatomic features the kidneys, renal pelvis, ureter, urinary bladder and urethra
		71.	locate renal angle
		72.	Perform renal punch and its clinical significance
		73.	Develop Understanding of KUB
		74.	Identify different parts of urinary system on IVU
Biochemistry	Titration acidity of urine	75.	Find out PH of urine

Theme-2 Edema and Urinary retention/ Scanty Urine

Introduction:

This theme consists of one-week activity, and comprises discussion on anatomy and development of the kidney, bladder, ureter, urethra, prostate. Body fluid compartments, functions of nephron, long term control of arterial pressure, electrolyte and osmolality are also included. Renal diseases/ disorders are also part of the theme.

The contents of this theme will be taught in LGf-Lectures, DSL and SGF-Practicals, SGD, SDL

THEME-2 Edema and Urinary retention/ Scanty Urine							
S.no	Topic	Content	S.no	Learning Objectives	Teaching strategies	Hour	Assessment
GROSS ANATOMY							
1	Ureters	Ureters Gross structure	76.	Describe the gross anatomy of ureters	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
			77.	Describe the relations of right ureter in males and females			
			78.	Describe the relations of left ureter in males and females			
			79.	Highlight the clinical significance of relations of right and left ureters in both sexes			
			80.	Discuss constrictions in ureter and their clinical relevance.			
2	Urinary bladder	Urinary bladder Gross structure	81	Describe the gross structure of urinary bladder	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
			82	Discuss the Ligaments/supports.			
			83.	Discuss the blood supply and nerve			

				supply of urinary bladder			
			84.	Discuss the relations of urinary bladder in males			
			85.	Discuss the relations of urinary bladder in females			
4	Prostate gland & urethra	Prostate gland gross structure	86.	Describe the structure of prostate gland	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
			87.	Describe Lobes, capsule, relations and structures within prostate.			
			88.	Discuss the common problems resulting from abnormal growth of the prostate. Relate the symptoms to structures		1	
		Urethra Gross structure	89.	Describe the gross anatomy of urethra			
			90.	Enlist the differences between male and female urethra			
EMBRYOLOGY							
1	Kidney & Ureter	Development of Kidney &	91.	.Enlist the stages of development of kidneys	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
		ureter	92.	Describe the formation of pronephric, mesonephric and metanephric kidneys			
			93.	Enumerate the derivatives of			

				metanephric blastema and describe their development			
			94.	.Enumerate the derivatives of metanephric diverticulum/ureteric bud			
			95.	Describe the changes in position and blood supply of kidneys during development			
		Congenital anomalies of kidney and ureter	96.	Enlist the various types of developmental anomalies of kidneys along with their embryological causes			
			97.	Enlist the various types of developmental anomalies of ureters along with their embryological causes			
	Bladder, Urethra & prostate	Development of bladder & urethra.	98.	Describe the development of bladder	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
			99	Discuss the developmental anomalies of bladder			
			100	Describe the development of male urethra			
			101	Describe the development of prostate and bulbourethral glands			
			102	Describe the development of female urethra			

			103	Discuss the developmental anomalies of male and female urethra			
		Development of prostate.	104	Describe Embryological development of prostate gland			
		Congenital anomalies of the bladder and urethra.	105	List and describe the common congenital anomalies of of bladder and urethra.			
HISTOLOGY							
1	URETER, Bladder	Ureter microscopy	106	Describe the microscopic anatomy of ureter	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
		Bladder microscopy	107	Describe the histological features of urinary bladder			
2	Prostate	Prostate	108	Describe the microscopic structure of prostate	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
3	Urethra	Urethra Microscopy	109	Discuss the microscopic structure of male and female urethra			
PHYSIOLOGY							
1.	Body fluid Compartments-I	Volumes of body fluid compartments	110	List the body fluid compartments			
			111	Recall the volumes of body fluid compartments			
			112	Discuss the interplay in fluid volumes between different fluid compartments			
			113	Describes principles of osmosis and osmotic pressure			

			114	Discuss the interplay between various pressures			
2.	Body fluid Compartments-II	Principles of osmosis and oedema	115	Discuss principles of edema <ul style="list-style-type: none"> • Intracellular fluid compartment • Extracellular fluid compartment • Intravascular fluids • Blood • Plasma • Interstitial fluid • Constituents of intra- and extracellular fluid compartments • Calculating fluid volumes • Osmosis and osmotic fluid regulation 	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
3.	Transport of substances across tubular cells -I	Reabsorption /Secretion along Different Parts of the Nephron	116	List approximate percentages of sodium reabsorbed in major tubular segments.	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
			117	List approximate percentages of water reabsorbed in major tubular segments.			
			118	Define the term iso-osmotic volume reabsorptin.			
			119	Describe proximal tubule sodium reabsorption, including the functions of the apical membrane sodium entry mechanisms and			

				the basolateral sodium-potassium-adenosine triphosphatase.			
			120	Explain why chloride reabsorption is coupled with sodium reabsorption, and lists the major pathways of proximal tubule chloride reabsorption.			
			121	State the maximum and minimum values of urine osmolality.			
			122	Define osmotic diuresis and water diuresis.			
			123	Explain why there is an obligatory water loss.			
			124	Describe the handling of sodium by the descending and ascending limbs, distal tubule, and collecting-duct system.			
			125	Describe the role of sodium-potassium-2 chloride symporters in the thick ascending limb.			
			126	Describe the handling of water by descending and ascending limbs, distal tubule, and collecting duct system			
4.		Mechanisms of regulation	127	Discuss the mechanisms of regulation of	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE

	Transport of substances across tubular cells -II	of tubular reabsorption		tubular reabsorption <ul style="list-style-type: none"> • 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 			
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5.	Renal Clearance-I	Use of inulin, urea and creatinine as indicators	128	Define the terms clearance and metabolic clearance rate, and differentiates between general clearance and renal clearance.	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
			129	List the information required for clearance calculation			
			130	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.			
			131	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.			
6.	Renal Clearance-II	Use of inulin, urea and creatinine as indicators	132	Calculate net rate of reabsorption or secretion for any substance	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
			133	Calculate fractional excretion of any substance.			
			134	Describe how to estimate glomerular filtration rate from			

				CCr and describes the limitations.			
			135	Describe how to use plasma concentrations of urea and creatinine as indicators of changes in glomerular filtration rate.			
7.	Diluted urine	Mechanism of diluted urine formation	136	Describe the process of "separating salt from water" and how this permits excretion of either concentrated or dilute urine.	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
			137	Describe how antidiuretic hormone affects water reabsorption.			
			138	Describe the characteristics of the medullary osmotic gradient.			
			139	Explain the role of the thick ascending limb, urea recycling, and medullary blood flow in generating the medullary osmotic gradient.			
			140	State why the medullary osmotic gradient is partially "washed out" during a water diuresis			
			141	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.			
			142	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 pure water loss).			
			143	Describe the control of thirst.			
			144	Describe the pathways by which sodium and water excretion are altered in response to sweating, diarrhoea, haemorrhage, high-salt diet, and low-salt diet.			
8.	Concentrated urine	Mechanism of concentrated urine formation	145	Discuss the mechanism of concentrated urine formation.	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
9.	Potassium	Renal regulation of Potassium	146	State the normal balance and distribution of potassium within different body compartments, including cells and extracellular fluid.	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
			147	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.			
			148	Describe how plasma levels of potassium do not always reflect the status of total-body potassium.			
			149	State generalizations about renal potassium handling for persons on high- or low-potassium diets.			
			150	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.			
			151	Describe how the cortical collecting duct can manifest net secretion or reabsorption; describes the role of principal cells and intercalated cells in these processes.			
			152	List the 3 inputs that control the rate of potassium secretion by the cortical collecting duct.			
			153	Describe the mechanism by which changes in potassium balance influence			

				aldosterone secretion.			
			154	State the effects of most diuretic drugs and osmotic diuretics on potassium excretion.			
			155	Describe the association between perturbations in acid-base status and the plasma potassium level			
10	Prostate gland	Functions	156	Discuss the physiological functions of the prostate.	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE
11.	Transport across cell	Physiochemical aspects	157	Discuss the physiochemical aspects (Diffusion, Adsorption, Viscosity, Colloid Osmotic pressure and role of Albumin in regulation of Osmotic pressure)	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE
12.	Osmolality	Regulation of extracellular fluid osmolality and sodium concentration-I	158	Discuss the homeostatic function of the kidneys	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE
			159	Explain the mechanism by which kidneys are able to form diluted or concentrated urine			
			160	Describe Mechanism of formation of dilute urine			
			161	Describe Mechanism of			

				formation of concentrated urine			
			162	Describe requirements for excreting a concentrated urine			
			163	Describe the counter-current mechanism			
			164	Describe Role of distal tubules and collecting ducts			
			165	Describe Quantifying urine concentration and dilution			
			166	Describe Disorders of urine concentration ability			
1 3 1 4	Osmolality and Sodium concentration –I & II	Regulation of extracellular fluid osmolality and sodium concentration - II	167	Discuss the homeostatic function of the kidneys	LGE/SGD	2	MCQ/SEQ/ VIVA/OSPE
			168	Discuss the principles of osmoregulation by the kidneys			
			169	Explain how the body regulated the osmolarity of fluid compartments			
			170	Describe Control of extracellular fluid osmolarity and sodium concentration			
			171	Describe Osmoreceptor-ADH feedback system			
			172	Describe Role of thirst in controlling			

				extracellular fluid osmolarity and concentration			
			173	Describe Salt-appetite mechanism and Integrated response to sodium intake			
1 5	Concentration of various ions in the body.	Regulation of concentration of potassium, calcium, phosphate and magnesium	174	Discuss the mechanisms of regulation of concentrations of various ions in the body	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
			175	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			
1 6.	Control of arterial pressure	Short and Long term control of arterial pressure by Kidneys	176	Describe the 3 temporal domains of blood pressure control and the major mechanisms associated with them.			
			177	Describe the relationship between renin and angiotensin II.			
			178	Describe the 3 detectors that can alter renin secretion.			
			179	Define pressure natriuresis and diuresis.			
			180	Define tubuloglomerular			

				feedback and describe the mechanism for tubuloglomerular feedback and auto regulation of glomerular filtration rate			
BIOCHEMISTRY							
1.	Renal control of Calcium & Phosphorus	Describe Renal control of Calcium & Phosphorus	181	State the normal total plasma calcium concentration and the fraction that is free.	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
			182	Describe the distribution of calcium between bone and extracellular fluid and the role of bone in regulating extracellular calcium.			
			183	Describe and compare osteocytes osteolysis and bone remodelling.			
			184	Describe renal handling of phosphate.			
			185	Describe how parathyroid hormone changes renal phosphate excretion.			
	Constituents of urine	Normal and abnormal Constituents of urine	186	Describe the normal and abnormal constituents of urine			
GENERAL SURGERY/UROLOGY							
	Benign prostatic hyperplasia	Urinary retention	187	Describe the etiology, and management of urinary retention	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE

			188	Describe the etiology, clinical features and treatment of Benign prostatic hyperplasia			
PATHOLOGY							
1.	Renal failure	Causes and pathophysiology	189	Enlist the causes of Renal failure/uraemia and abnormalities related to micturition including incontinence	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
			190	Discuss the causes and pathophysiology of Chronic Renal failure			
2.	Urinary stones	Pathophysiology	191	Describe the pathophysiology of Urinary stones	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
3.	Glomerular diseases	Glomerulonephritis	192	Describe the etiology and pathogenesis of glomerulonephritis	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
4.	Classification of kidney disorders	Aetiology, Site and type of dysfunction	193	Classify kidney disorders according to etiology, site of dysfunction and type of dysfunction - Acute/ chronic -Infectious -Immunological -Neoplastic - Vascular/interstitial/parenchymal - Primary/systemic	LGF/SGD	1	MCQ/SEQ/IVA/OSPE
5.	Nephrotic	Aetiology and Pathophysiology	194	Describe Nephrotic syndrome and its etiology	LGF/SGD	1	MCQ/SEQ/IVA/OSPE

	syndrom e						
PHARMACOLOGY							
1.	Nephrot oxic drugs		195 .	Describe the mechanism of drug excretion	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
			196 .	Enlist nephrotoxic drugs			
			197 .	Describe the mechanism of action of diuretic drugs			
2.	Drugs acting on the renal system	Diuretics	198 .	Classify diuretics	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
COMMUNITY MEDICINE/PUBLIC HEALTH							
1.	Quality of life in diseases	Quality of life in problems of prostate	199 .	Discuss quality of life issues in patients with prostate problems	LGF/SG D	1	MCQ/SEQ/V IVA/OSPE
			200 .	Overview of the concept of quality of life (QoL)			
			201	Discuss the significance of quality of life in disease and treatment settings			
			202	Discuss quality of life issues in geriatric population			

List of practicals

Physiology	Intake output chart maintenance in bed	203	Maintain Intake output chart maintenance in bed ridden patients
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Introduction:

The contents of teaching include LGF-Lectures, DSL and SGF-Practicals, SGDs, SDL.

THEME-3 Urinary incontinence							
S. n o	Topic	Content	S. no	Learning Objectives	Teaching strategies	H o u r	Assessment
GROSS ANATOMY							

1.	Pelvis & Perineum	Osteology of pelvis	206	Define the pelvis and the perineum Discuss the openings in the pelvis and what passes through them	LGF/SGD	1	MCQ/SEQ/ VIVA/OSP E
		Urogenital triangular	207	List and describe the contents of the urogenital triangle -Contents of the male urogenital triangle -Urethral injuries			
		Applied aspects of urethra and perineum	208	Injury to the perineum in childhood			
PHYSIOLOGY							
1.	Urinary bladder -I	Micturition	209	Describe the functional anatomy of urinary bladder	LGF/SGD	1	MCQ/SEQ/ VIVA/OSP E
			210	Explain the mechanism of micturition			
			211	Explain the micturition reflex and relate structures of the bladder with function			
			212	Explain basal cystometrogram			
			213	Describe the nervous control of bladder functions			
2.	Urinary bladder -II	Urinary incontinence	214	Discuss the causes, symptoms and management of patients with urinary	LGF/SGD	1	MCQ/SEQ/ VIVA/OSP E

				incontinence, urgency, frequency, burning micturition etc			
			215	Causes of urinary incontinence, urgency, frequency, burning micturition			
			216	Terms related to urinary obstruction and incontinence			
			217	Describe Clinical presentation of continence disorders			
			218	Explain General management of incontinence			
BIOCHEMISTRY							
1.	Water balance/metabolism	Regulation and disorders of water balance	219	Mechanism & regulation of Water balance	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE
			220	Disorders of water balance, such as dehydration & over hydration			
			221	Electrolytes (intracellular & extracellular cations) & its metabolism			
			222	Disorders of electrolyte metabolism			
RADIOLOGY							
1.	Radiological diagnosis of urinary pathologies	Normal radiographs and special	223	Identify and describe the various anatomic landmarks of the	LGF/SGD	1	MCQ/SEQ/VIVA/OSPE

		radiologic al tests		renal system on radiographs			
			224	Discuss special radiological tests to determine renal function and pathologies			
			225	Describe normal radiographs of abdomen and pelvis			
			226	Describe special radiological tests to show renal pathology and function			
			227	Abdominal ultrasound			
CLINICAL (NEPHROLOGY/ MEDICINE)							
1.	Dialysis-I	Types and indications of dialysis	228	Describe the types, indications and the process of dialysis for kidney disease	LGF/SGD	1	MCQ/SEQ/ VIVA/OSP E
2.	Dialysis-II	Process of dialysis/ disorders of acid- base balance, electrolyte	229	Describe Types of dialysis -Peritoneal dialysis -Hemodialysis -Hemofiltration -Haemodiafiltration -Intestinal dialysis -indications for dialysis	LGF/SGD	1	MCQ/SEQ/ VIVA/OSP E
			230	Discuss disorders of acid-base balance, electrolyte abnormalities uremia or fluid overload resulting from acute and chronic renal failure, and intoxication			

			231	Describe The process of hemodialysis and peritoneal dialysis			
			232	Describe Dialyzable substances			
3.	Frequency of micturition	Patient with excessive urination	233	Discuss the disorders associated with urine concentrating ability	LGF/SGD	1	MCQ/SEQ/ VIVA/OSP E
			234	Plan a line of investigation and management in renal disorders			
			235	Disorders of renal concentration ability			
			236	Comparison of excessive urine volume with increased frequency of micturition			
			237	Describe the mechanism of secretion and action of ADH			
			238	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			
4.	Urinary incontinence	Patient with continuou	239	Discuss the causes of urinary incontinence	LGF/SGD	1	MCQ/SEQ/ VIVA/OSP E

		s dribbling of urine					
			240	Discuss the significance of radiological investigations in cases of urinary incontinence in children			
			241	Define and describe Enuresis, its causes and treatment			
			242	Describe Causes of urinary incontinence			
			243	Describe the micturition reflex			
			244	Discuss Tests for investigating urinary incontinence			
PATHOLOGY							
1.	Perineal region	Common pathologies of perineal region	245	List and define the common pathologies of the perineal region.	LGF/SGD	1	MCQ/SEQ/ VIVA/OSPE
			246	Describe Urethral infection			

List of Practicals

Anatomy	surface anatomy of the perineum and radiology	247	Identification of the various structures forming the perineum on models Identify the radiographic landmarks of the perineum
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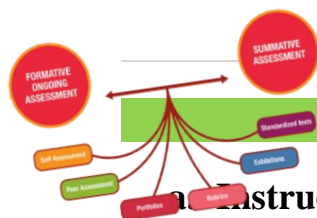
	Histologic examination urinary system	248	Identify the characteristic microscopic features of the urinary system -Kidney -Ureter -Urinary bladder -Urethra
Biochemistry	Creatinine in urine	249	Estimation of creatinine in 24 hour urine sample
Physiology	Arterial blood-gas analysis	250	Arterial blood sampling Analysis and interpretation of arterial blood gases

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



10 Learning Opportunities and Resources

S.No	SUBJECT	LEARNING RESOURCES/ RECOMMENDED BOOKS
1.	Gross Anatomy	Clinical Anatomy by Regions by Richard S. Snell (Latest Edition)
		Gray's Anatomy for Students (Latest Edition)
		K.L. Moore, Clinically Oriented Anatomy (Latest Edition)
		Netter's "Atlas of Human Anatomy (Latest Edition)
		Last's Anatomy (Latest Edition)
2.	Histology	Textbook of Histology by Junqueira (Latest Edition)
		diFiore's ATLAS of Histology with Functional Correlations (Latest Edition)
		Atlas of Human Histology by Wheaters. (Latest Edition)
		Textbook of Histology by Laiq Hussain (Latest Edition)
3.	Embryology	Langman's Medical Embryology (Latest Edition)
		The Developing Human "by Keith L Moore" (Latest Edition)
4.	Physiology	Textbook of Medical Physiology by Guyton and Hall (Latest Edition)
		Ganong's "Review of Medical Physiology" (Latest Edition)
5.	Biochemistry	Harper's Illustrated Biochemistry (Latest Edition)
		Lippincott's Illustrated Review: Biochemistry (Latest Edition)
6.	Pharmacology	Katzung's Basic and Clinical Pharmacology (Latest Edition)
7.	Pathology	Robbin's Basic Pathology (Latest Edition)
8.	Community Medicine	Essential Community Medicine (Latest Edition)
		K Park Textbook of Preventive and Social Medicine (Latest Edition)
9.	General Medicine	Davidson's Principles and Practice of Medicine (Latest Edition)
10.	Radiology	David Sutton's Textbook of Radiology and Imaging (Latest Edition)
11.	Neurosurgery	Greenberg's Textbook of Neurosurgery
		Rangacharya's Principles of Neurosurgery



11 Examination and Methods of Assessment:

Instructions:

- Students must arrive the examination venue at least 15 minutes before the scheduled start time. Latecomers 15 minutes after the start of exam, will not be allowed to enter the examination hall after the start time, and if permitted, they will not receive extra time.
- Students without College ID Card and white Lab Coat will not be allowed to sit in exam.
- In case of an emergency such as a medical emergency, students should inform the examination supervisor.
- Students are required to submit prohibited items such as mobile phones, smartwatches, electronic devices, books, notes, or any unauthorized materials before entering the examination hall.
- Students must maintain complete silence within the examination hall. They should refrain from communicating with fellow students and strictly follow invigilator instructions.
- Students must mark their attendance properly.
- No student will be allowed to leave the examination hall before half the time is over and paper should be properly handed to the examiner.
- Violation of these guidelines may lead to disqualification from the examination.

b. The Distribution of Internal Assessment Score (10% Marks):

The distribution of Internal Assessment Score for 2nd Year MBBS will be as follows:

- Total Marks for 2nd Year MBBS= 700 & Internal Assessment Marks=70 (10%)
- 50 % of the Internal Assessment Marks may be given to Block Exams
- 50 % of the Internal Assessment marks may be given to Class Test/ End of Module Exam, Assignments and Presentations.
- Biochemistry department is responsible to maintain the attendance record for BLOCK – D in coordination with all the concerned departments.
- Anatomy department is responsible to maintain the attendance record for BLOCK – E in coordination with all the concerned departments.
- Physiology department is responsible to maintain the attendance record for BLOCK – F in coordination with all the concerned departments.

A. Distribution of 20 Marks for Block Papers for second Year MBBS will be as under:

Block	Block D	Block E	Block F	Total
Marks	07	6.5	6.5	20

B. Distribution of 15 Marks for Block OSPE will be as under:

Block	Block D	Block E	Block F	Total
Marks	05	05	05	15

C. Distribution of 20 marks for Class Test/ End of Module Exam & Assignments for 2nd Year MBBS will be as under:

Subject (Theory)	Block D	Block E	Block F	Total
Class Test/ End of Module Exam	04	3.5	3.5	11
Assignments	03	03	03	09
Total	07	6.5	6.5	20

D. Distribution of 15 marks for Presentations, Attitude/ Behavior for 2nd Year MBBS will be as under:

Subject (OSPE)	Block D	Block E	Block F	Total
Presentations	03	03	03	09
Attitude/ Behavior	02	02	02	06
Total	05	05	05	15

c. University Examination: Exam has 90% Marks

- To appear in any university examination, more than 75% attendance in all disciplines is mandatory for the students.
- The Paper A will be comprised of 120 MCQs. The distribution of 90% Marks for Paper --- Written Exam will be as under:

Blue Print for Block E Assessment			
SUBJECT	GIT	Renal	Total MCQs
Gross Anatomy	16	7	23
Histology	9	4	13
Embryology	4	3	7
Physiology	15	14	29
Biochemistry	22	8	30
PRIME	3	2	5
Pathology	3	1	4
Pharmacology	1	1	2
Forensic Medicine	1	0	1
Community Medicine	1	0	1
General Medicine	1	1	2
EYE	0	0	0
ENT	0	0	0
Surgery	2	1	3
Total	78	42	120

BLOCK E OSPE BLUEPRINT

SUBJECT	GIT	RENAL	VIVA STATIONS	TOTAL STATIONS
Anatomy	4	3	2	9
Histology				
Embryology				
Physiology	0	1	2	3
Biochemistry	3	1	2	6
TOTAL	7	5	6	18

12 Tentative Timetables

SWAT MEDICAL COLLEGE

DEPARTMENT OF MEDICAL EDUCATION

TIME TABLE FOR RENAL MODULE (2nd Year MBBS) SESSION 2023-24

WEEK-1

Theme-1 Loin pain

Days	8:00 to 9:00 am	09:00 to 10:00 am	10:00 am to 11:00 am	11:00am to 1:00 pm		1:30 to 2:30 pm
Monday 00/07/24	Gross Anatomy Overview of the urinary system Dr.	Gross Anatomy Kidneys Dr.	Physiology Physiologic al Anatomy of the kidneys and Overview of its Functions Dr.	PRACTICALS/SGDs Batch A: Phy SGD Dr. Batch B: Histo P Dr. Batch C: Bio P Dr.		Anat-DSL Dr.
Tuesday 00/07/24	Physiology Glomerular Filtration: Determinant s and Equation Dr.	Gross Anatomy Posterior abdominal wall –I Dr.	Physiology Nervous & Hormonal Control of Renal Circulation Dr.	PRACTICALS /SGDs Batch A: Bio P Dr. Batch B: Phy SGD Dr. Batch C: Histo P Dr.		Phy-DSL Dr.
Wednesday 00/07/24	Gross Anatomy Posterior abdominal wall –II Dr.	Embryolog y Developme nt of the urinary system & its Congenital anomalies Dr.	Histology Histology of Kidney-I Dr.	PRACTICALS/SGDs Batch A: Histo P Dr. Batch B: Bio P Dr. Batch C: Phy SGD Dr.		Physiology Auto regulation of GFR and renal blood flow Dr.
Thursday 00/07/24	Histology Histology of Kidney-II Dr.	Biochemist ry Acid-base balance & Imbalance Dr.	Physiology Review of Transport Mechanism s across the Cell Membrane Dr.	Patholog y Smoky Urine Dr.	Pathology Renal disorders Dr.	PRIME Sampling Techniques and sample selection Dr.
Friday 00/07/24	Pak Studies Kashmir Dispute Mr.	Pathology Systemic Diseases affecting Kidneys Dr.	Skill Lab Anatomy Dr.	Skill Lab Physiolo gy Dr.	Skill Lab Medicine Dr.	SDL (SLRC/Library)

SWAT MEDICAL COLLEGE
DEPARTMENT OF MEDICAL EDUCATION
TIME TABLE FOR RENAL MODULE (2nd Year MBBS) SESSION 2023-24
WEEK-2

Theme-2 Edema and Urinary retention

Days	8:00 to 9:00 am	09:00 to 10:00 am	10:00 am to 11:00 am	11:00am to 1:00 pm		1:30 to 2:30 pm
Monday 05/07/21	Gross Anatomy Ureters Urinary bladder Dr.	Gross Anatomy Prostate gland Urethra Dr.	Physiology Body fluid compartments Dr.	PRACTICALS/SGDs Batch A: Phy SGD Dr. Batch B: Histo P Dr. Batch C: Bio P Dr.		Anat-DSL Dr.
Tuesday 06/07/21	Physiology Reabsorption /Secretion along Different Parts of the Nephron-I Dr.	Embryology Development of the Kidney & ureter Dr.	Physiology Reabsorption /Secretion along Different Parts of the Nephron-II Dr.	PRACTICALS /SGDs Batch A: Bio P Dr. Batch B: Phy SGD Dr. Batch C: Histo P Dr.		Phy-DSL Dr.
Wednesday 07/07/21	Physiology Mechanisms of regulation of tubular Reabsorption-I Dr.	Embryology Bladder and urethra Dr.	Histology Histology of Ureter Bladder Dr.	PRACTICALS/SGDs Batch A: Histo P Dr. Batch B: Bio P Dr. Batch C: Phy SGD Dr.		Bio-DSL Dr.
Thursday 08/07/21	Histology Histology of Prostate & Urethra Dr.	Embryology Prostate Gland Dr.	Physiology Mechanisms of regulation of tubular Reabsorption-II Dr.	Biochemistry Renal Control of Calcium & Phosphorus Dr.	Physiology Concept of Renal Clearance Dr.	PRIME Designing of questionnaire Dr.
Friday 09/07/21	SDL (SLRC/Library)	Physiology Mechanism of diluted urine formation Dr.	Skill Lab Anatomy Dr.	Skill Lab Physiology Dr.	Skill Lab Medicine Dr.	SDL (SLRC/Library)

SWAT MEDICAL COLLEGE
DEPARTMENT OF MEDICAL EDUCATION
TIME TABLE FOR RENAL MODULE (2nd Year MBBS) SESSION 2020-21
WEEK-3

Theme-2 Edema and Urinary retention

Days	8:00 to 9:00 am	09:00 to 10:00 am	10:00 am to 11:00 am	11:00am to 1:00 pm		1:30 to 2:30 pm
Monday 12/07/21	Physiology Mechanism of concentrated urine formation. Dr.	Physiology Renal regulation of Potassium Dr.	Physiology The prostate Dr.	PRACTICALS/SGDs Batch A: Phy Dr. Batch B: Histo Dr. Batch C: Bio Dr.		Anat-DSL Dr.
Tuesday 13/07/21	Physiology Physiochemical aspects Dr.	Biochemistry Constituents of Urine Dr.	Physiology Regulation of extracellular fluid osmolality and sodium Concentration-I Dr.	PRACTICALS /SGDs Batch A: Bio Dr. Batch B: Phy Dr. Batch C: Histo P Dr.		Phy-DSL Dr.
Wednesday 14/07/21	Physiology Regulation of extracellular fluid osmolality and sodium Concentration-II Dr.	Physiology Regulation of concentration of potassium, calcium, phosphate and magnesium Dr.	Physiology Short and Long term control of Blood pressure by Kidneys Dr.	PRACTICALS/SGDs Batch A: Histo Dr. Batch B: Bio Dr. Batch C: Phy Dr.		Bio-DSL Dr.
Thursday 15/07/21	Surgery/Urology Urinary Retention Dr.	Pathology Renal Failure Dr.	Pathology Renal Stones Dr.	Community Medicine Quality of life in problems of prostate Dr.	Pathology Glomerular Diseases Dr.	SDL (SLRC/Library)
Friday 16/07/21	SDL (SLRC/Library)	Pathology Classification of kidney disorders Dr.	Pathology Nephrotic syndrome Dr.	Pharmacology Nephrotoxic drugs Dr.	Pharmacology Drugs acting on the renal system Dr.	SDL (SLRC/Library)

SWAT MEDICAL COLLEGE
DEPARTMENT OF MEDICAL EDUCATION
TIME TABLE FOR RENAL MODULE (2nd Year MBBS) SESSION 2020-21
WEEK-4

Theme-3 Urinary Incontinence

Days	8:00 to 9:00 am	09:00 to 10:00 am	10:00 am to 11:00 am	11:00am to 1:00 pm	P R A Y E R S B R E A K	1:30 to 2:30 pm
Monday 12/07/021	Gross Anatomy The Perineum –I Dr.	Physiology Urinary bladder and micturition Dr.	Gross Anatomy The Perineum – II Dr.	PRACTICALS/SGDs Batch A: Phy Dr. Batch B: Histo Dr. Batch C: Bio Dr.		SDL (SLRC/Library)
Tuesday 13/07/021	Physiology Urinary Incontinence Dr.	Biochemistry Water Balance/ Metabolism Dr.	Radiology Radiological diagnosis of urinary pathologies Dr.	PRACTICALS /SGDs Batch A: Bio P Dr. Batch B: Phy SGD Dr. Batch C: Histo P Dr.		Clinical Nephrology/ Medicine Dialysis Dr.
Wednesday 14/07/021	SDL (SLRC/Library)	Clinical Nephrology/ Medicine Patient with excessive urination Dr.	Pathology Common pathologies of perineal region Dr.	PRACTICALS/SGDs Batch A: Histo P Dr. Batch B: Bio P Dr. Batch C: Phy SGD Dr.		Clinical Nephrology/ Medicine Patient with continuous dribbling of urine Dr.
Thursday 15/07/021	BLOCK E WRITTEN EXAM					
Friday 16/07/021	BLOCK E OSPE					

13 For inquiry and troubleshooting



Please contact
Dr Humaira Ali
Associate Professor Anatomy
0333 5139383

14 Module Evaluation Form

This is an example of feedback form and real-time feedback will be obtained through an electronic link and/or your LMS.

MBBS Year: _____ Block: _____ Module: _____

Date: _____

1. (Unsatisfactory) 2 (Fair)

3 (Satisfactory)

4 (Good)

5 (Excellent)

Category: Course Contents

No.	Question	1	2	3	4	5
1	To what extent did the course contents align with the stated learning objectives of the module?					
2	How clear and comprehensive were the course materials provided in this module?					
3	Were the core topics adequately covered, ensuring a well-rounded understanding of the subject?					
4	How current and up-to-date were the course contents in reflecting recent advancements?					
5	Did the module incorporate real-world applications and case studies effectively?					
	Category: Learning Resources					
6	Were the learning resources (e.g., textbooks, online materials, laboratory facilities) readily available and easily accessible?					
7	How helpful were additional learning resources such as supplementary readings or multimedia content?					
8	Did the module offer adequate support for research and independent study?					
9	Were digital resources and online platforms effectively utilized to enhance the learning experience?					
10	Were there sufficient opportunities for hands-on practice and practical application of knowledge?					
	Category: Teaching Methods					

11	How well did instructors engage with students and create a supportive learning environment?					
12	Were diverse teaching methods (e.g., lectures, group discussions, simulations) effectively employed?					
13	How responsive were instructors to questions, concerns, and feedback from students?					
14	To what extent did instructors provide timely and constructive feedback on assignments and assessments?					
15	Were opportunities for collaborative learning and peer-to-peer interactions encouraged and facilitated?					
No.	Category: Engagement and Motivation					
16	To what extent did the module use real-world examples and practical applications to engage students?					
17	How well were active learning techniques (e.g., problem-solving, case studies) integrated into the curriculum?					
18	Did the module provide opportunities for students to pursue their individual interests within the subject matter?					
19	Were assessments designed to challenge and motivate students to excel in their studies?					
	Category: Inclusivity and Diversity					
20	How well did the module accommodate different learning styles and preferences among students?					
21	Were efforts made to include diverse perspectives, cultures, and backgrounds in the curriculum?					
22	How effectively were accommodations provided for students with varying levels of prior knowledge?					
	Category: Overall					
No.	Question	1 (Very Poor)	2 (Poor)	3 (Fair)	4 (Good)	5 (Excellent)
23	How would you rate the overall quality of this module?					

15 Students Diary/Notes

[illegible]

PROGRESS: _____

ACHIEVMENT: