Course Specifications

General Information

Course name	Reanal System
Course number	MDCN3413
Faculty	
Department	
Course type	Major Needs
Course level	3
Credit hours (theoretical)	4
Credit hours (practical)	1
Course Prerequisites	

Course Objectives

1 - Understanding the anatomy and physiology of the renal system: Develop a comprehensive understanding of the structure and function of the kidneys, nephrons, and other components of the renal system. Understand the processes involved in urine formation, filtration, reabsorption, and secretion.

2 - Understanding renal diseases and disorders: Gain knowledge about common renal diseases and disorders, including acute kidney injury, chronic kidney disease, glomerular diseases, renal infections, and renal calculi. Understand the pathophysiology, clinical features, diagnostic approaches, and treatment options for these conditions.

3 - Learning about renal diagnostic tests and imaging: Acquire knowledge about the various diagnostic tests and imaging modalities used to evaluate renal function and identify renal pathology. Understand the interpretation of laboratory parameters, such as serum creatinine, blood urea nitrogen, urinalysis, and imaging findings.

4 - Understanding renal pharmacology: Gain familiarity with the pharmacological agents used in the management of renal diseases, including diuretics, antihypertensive drugs, and immunosuppressants. Understand their mechanisms of action, indications, contraindications, and potential adverse effects.

5 - Learning about renal replacement therapy: Understand the principles and modalities of renal replacement therapy, including dialysis (hemodialysis and peritoneal dialysis) and kidney transplantation. Gain knowledge about patient selection, complications, and long-term management of renal replacement therapy.

6 - Discussing common electrolyte and acid-base disorders: Acquire knowledge about the normal physiology of electrolytes and acid-base balance and the pathophysiology of common disturbances such as hyponatremia, hypernatremia, hyperkalemia, hypokalemia, acidosis, and alkalosis. Understand their clinical manifestations, diagnostic approaches, and treatment strategies.

7 - Understanding the management of renal emergencies: Develop skills in recognizing and managing renal emergencies, including acute kidney injury, urinary tract obstruction, and kidney stones. Understand the principles of acute resuscitation, fluid and electrolyte management, and interventions to preserve renal function.

8 - Discussing renal disease prevention and health promotion: Gain knowledge about preventive measures and health promotion strategies for maintaining optimal renal health. Understand the importance of lifestyle modifications, such as maintaining a healthy diet, adequate fluid intake, and regular exercise, in preventing renal diseases.

9 - Understanding ethical and legal considerations in renal care: Discuss ethical issues related to renal care, including organ donation and transplantation, end-of-life decisions, and allocation of limited resources. Understand the legal aspects of renal care, including regulatory frameworks, informed consent, and patient rights

10 - . To know the structure and function of each component of the nephron

Intended Learning Outcomes

Knowledge and Understanding	* To be able to Explain the basic anatomy of the renal system (i.e. kidneys, ureter, bladder and urethra) * To be able to Explain the development of the renal system and abnormalities that may arise during developmentExplain the development of the renal system and abnormalities that may arise during development * Describe the microscopic structure of the renal system, * Describe the normal physiological functions of the renal system and specifically its importance in maintain homeostasis. * Apply the basic scientific knowledge regarding the metabolism of proteins and amino acids and show how defects can lead to a disease * Identify different types of injuries to the renal system and explain the mechanism of how different disease affect the renal structure by disrupting its function, * Describe the psychosocial impact of the renal diseases (on patient, family and society as a whole) in relation to Pakistan * Describe how renal diseases the psychosocial aspects
Intellectual Skills	* Interpret the basic blood and radiological investigations (Urine detail report, urea and electrolytes, arterial blood gases and radiological investigations in diagnosing renal diseases and function of the renal system)

Course Contents

1 - Macroscopic and microscopic (histology) structure of the urinary system: kidney, ureter and bladder and urethra,
2 - Posterior abdominal wall and lumbar region
3 - Developmental anatomy of the urinary system and its abnormalities,
4 - Functions of the renal system (acid-base balance, hormonal, filtration etc.)
5 - Glomerular filtration
6 - Renal circulation and autoregulation
7 - Tubular reabsorption & secretions
8 - Mechanism of concertation of urine
9 - Micturition
10 - Urinary incontinence
11 - Epidemiology of renal diseases
12 - Dietary requirements of patients suffering from renal diseases
13 - Metabolism of protein and amino acids; urea cycle
14 - Metabolism of minerals: sodium, potassium, chloride and phosphate
15 - Pathophysiological principles of renal diseases

Students Assessment

Assessment Method	TIME	MARKS
Labs exam		20
Final exam		80

Books and References

Essential books	Langmans medical embryology.
	Junguira histology
	Robbins pathology
	Snell anatomy
	Guyton physiology