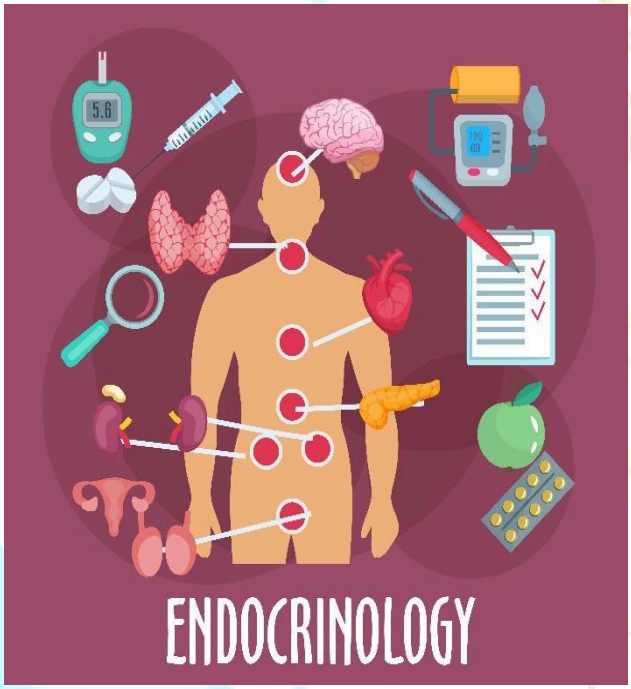
# STUDY GUIDE

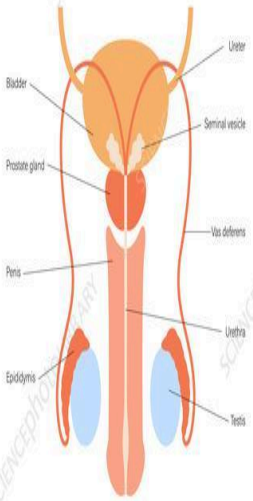
# Block – 5

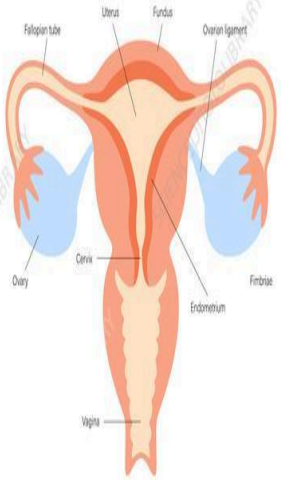
***Module 8:*** **ENDOCRINOLOGY & REPRODUCTION-I**

***Module 9:*** **Head n Neck & Special Senses**

## 2nd Year MBBS




**Department Of Medical Education**

**D.GKHAN MEDICAL COLLEGE**

**Dera Ghazi KHAN**

# Table of Contents

## Contents

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# 1. List ofAbbreviations

| Abbreviations | Subjects |
|---|---|
| A | Anatomy |
| ABG | arterial blood gas |
| Ag | Aging |
| AKI | acute kidney injury |
| ALT | alanine transaminase |
| AMP | Adenosine monophosphate |
| ANS | Autonomic Nervous System |
| AST | aspartate aminotransferase |
| AV | Atrioventricular |
| B | Biochemistry |
| BhS | Behavioral Sciences |
| C | Civics |
| CBC | Complete Blood Count |
| C-FRC | Clinical-Foundation Rotation Clerkship |
| CK | Creatine kinase |
| CM | Community Medicine |
| CNS | Central Nervous System |
| CO | Carbon monoxide |
| CO2 | Carbon dioxide |
| COPD | Chronic obstructive pulmonary disease |
| COX | cyclooxygenase |
| CPR | Cardio pulmonary Resuscitation |
| CT | Computed tomography |
| CV | Cardiovascular |

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|---|---|
| ECG | Electrocardiography |
| ECP | Emergency contraceptive pills |
| EEG | Electroencephalogram |
| EnR | Endocrinology & Reproduction |
| ENT | Ear Nose Throat |
| ER | Emergency Room |
| F | Foundation |
| FEV1 | Forced Expiratory Volume 1 |
| FM | Forensic Medicine |
| FVC | Forced Vital Capacity |
| GFR | Glomerular Filtration Rate |
| GIT | Gastrointestinal tract |
| GMP | guanosine monophosphate |
| GO | Gynecology and Obstetrics |
| GTO | Golgi Tendon Organ |
| HCL | Hydrochloric acid |
| H & E | Hematoxylin and eosin |
| HL | Hematopoietic & Lymphatic |
| HMP | Hexose Monophosphate |
| HNSS | Head & Neck and Special Senses |
| ICF | Intra Cellular Fluid |
| IL | Interleukin |
| IN | Inflammation |
| INR | International Normalized Ratio |
| IUD | Intrauterine device |
| IUGR | Intra Uterine Growth Restriction |

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|---|---|
| MSD | Musculoskeletal disorders |
| NEAA | non-essential amino acids |
| NMJ | Neuro Muscular Junction |
| NS | Neurosciences |
| O | Ophthalmology |
| Or | Orientation |
| P | Physiology |
| Pa | Pathology |
| PAF | Platelet activating factor |
| PBL | Problem Based Learning |
| PCR | Polymerase Chain Reaction |
| PDGF | Platelet derived growth factor |
| Pe | Pediatrics |
| PEM | Protein Energy Malnutrition |
| PERLs | Professionalism, Ethics, Research, Leadership |
| Ph | Pharmacology |
| PNS | Peripheral Nervous System |
| Psy | Psychiatry |
| PVC | Premature Ventricular Contraction |
| QALY | Quality-Adjusted Life Year |
| QI | Quran and Islamiyat |
| R | Renal |
| Ra | Radiology |
| RBCs | Red Blood cells |
| RDA | Recommended Dietary Allowance |
| Re | Respiratory |

## 2. Curriculum 2k24Framework

| YEAR | MODULES | |
|---|---|---|
| YEAR 1 | • Foundation-1<br>• Hematopoietic & Lymphatic | **Block 1** |
| | • Musculoskeletal & Locomotion-1 | **Block 2** |
| | • Cardiovascular-1<br>• Respiratory-1 | **Block 3** |
| | • PERLs 1<br>• Quran-1<br>• Islamiyat & Pak Studies | **Will be taught throughout the year** |
| | • Clinical Skills Foundation<br>C-FRC **1** (Clinical – Foundation, Rotation, Clerkships) | |
| YEAR 2 | • GIT & Nutrition<br>• Renal<br>• Endocrinology & Reproduction<br>• Head & Neck, Special Senses<br>• Neurosciences<br>• Inflammation<br>• PERLs - 2<br>• Quran-2<br>• Islamiyat & Pak Studies | |
| | • Clinical Skills Foundation<br>C-FRC **2** (Clinical – Foundation, Rotation, Clerkships) | |
| YEAR 3 | • Foundation-2<br>• Infectious Diseases<br>• Neoplasia<br>• Musculoskeletal & Locomotion-2<br>• Hematopoietic, Immunity & Transplant-2 | |

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|---|---|
| | • Cardiovascular-2<br>• Respiratory-2<br>• Forensic medicine<br>• Community Medicine & family Health-1<br>• PERLs - 3<br>• Quran-3 |
| | • Clinical Rotations<br>C-FRC **3** (Clinical – Foundation, Rotation, Clerkships) |
| YEAR 4 | • Renal-2<br>• Endocrine & Reproduction-2<br>• GIT & Nutrition-2<br>• Neourosciences-2<br>• Maternal & Child Health<br>• Ophthalmology<br>• Otorhinolaryngology<br>• Community Medicine & family Health-2<br>• Psychiatry & Behavioral Sciences<br>• PERLs - 4<br>• Quran-4<br>• **Electives**<br>• **BLS workshop** |
| | • Clinical Rotations<br>C-FRC **4** (Clinical – Foundation, Rotation, Clerkships) |
| YEAR 5 (Clerkships) | • Gynecology & Obstetrics<br>• Pediatrics<br>• Medicine<br>• Surgery<br><br>**Clinical Clerkships**<br>C-FRC **5** (Clinical – Foundation, Rotation, Clerkships) |

# 3. Introduction to Study Guide

The study guide serves several crucial purposes:

1. **Communicating information on the organization and management of the module:**

   This aids students in identifying the appropriate point of contact in case they encounter any difficulties during the semester.

2. **Defining the objectives expected to be achieved by the end of the module:**

   It outlines clear learning goals, ensuring that students understand what is expected of them academically.

3. **Identifying the learning strategies employed to achieve module objectives:**

   These strategies may encompass various methods such as lectures, small group sessions, clinical skills practice, demonstrations, tutorials, and case-based learning.

4. **Providing a list of learning resources:**

   Students are offered a comprehensive list of resources, including books, computer-assisted learning programs, web links, and journals. These resources empower students to maximize their learning potential.

5. **Highlighting information on the contribution of continuous assessment and semester examinations:**

   This section emphasizes the significance of ongoing assessments and final exams in determining a student's overall performance in the module.

6. **Including information on assessment methods:**

   Details about the various assessment methods employed to evaluate students' progress in achieving the objectives are outlined.

7. **Focusing on examination policies, rules, and regulations:**

   This section clarifies the policies and regulations governing examinations, ensuring that students are well-informed about the rules they must adhere to during their assessments.

   By providing students with this comprehensive guide, educational institutions aim to enhance their learning experience, facilitate effective academic management, and foster compliance with academic standards and regulations.

# Block–5 Module Committee

| BASIC HEALTH SCIENCES | CLINICAL SCIENCES |
|---|---|
| **Block Coordinator** | **DR.RUKHSANA MALIK** |
| **Anatomy:** Dr.M RIZWAN ANWAR | **Medicine:** DR.KASHIF ALI |
| **Physiology:** Prof. Dr. ABDUL REHMAN | **Surgery:** Dr.ASIF NADEEM |
| **Biochemistry:** **DR.M FAROOQ AHMAD MALIK** | **Radiology:** DR.SHAHID RASOOL |
| **Community Medicine:** **DR.MOZZAM ALI JASKANI** | **Gynecology:** **DR RASHIDA PERVEEN** : |
| **Pathology:** **PROF.DR.SHAHID HABIB** | |
| **Pharmacology:** **PROF.DR ABDUL JABBAR** | |
| **Behavioral Sciences:** **DR.RIZWAN UL HUSNAIN SIDDIQUI** | |
| **Medical Education:** **PROF.DR HAQ DAD DURANI** | |

**Principal DGKMC**

**Prof. Dr. M. ASIF QURESHI**

# *ENDOCRINOLOGY & REPRODUCTION-I*

# 4. Introduction of ENDOCRINOLOGY & REPRODUCTION-I

Welcome to the Gastrointestinal Tract (GIT) and Nutrition module, an essential component of your second-year MBBS curriculum. This module is designed to provide you with a comprehensive understanding of the structure, function, and disorders of the gastrointestinal system, as well as the fundamental principles of nutrition and their clinical implications.

The gastrointestinal tract, often referred to as the digestive system, plays a crucial role in the breakdown and absorption of nutrients essential for maintaining health and sustaining life. Through a series of intricate processes, beginning with ingestion and culminating in excretion, the GIT facilitates the digestion of food, absorption of nutrients, and elimination of waste products.

Throughout this module, you will delve into the anatomy and physiology of the GIT, exploring its various components such as the mouth, esophagus, stomach, small intestine, large intestine, and associated accessory organs including the liver, gallbladder, and pancreas. You will learn about the mechanisms underlying digestion, absorption, and motility, gaining insight into how the intricate interplay of physiological processes ensures efficient nutrient uptake and waste elimination.

In addition to understanding the normal functioning of the GIT, this module will also focus on the pathophysiology of gastrointestinal disorders.

Moreover, this module will emphasize the crucial role of nutrition in maintaining health and preventing disease. You will explore the principles of nutritional science, including macronutrients, micronutrients, dietary guidelines, and the impact of nutrition on overall health and well-being. Understanding the relationship between diet and disease will enable you to counsel patients on dietary modifications and lifestyle interventions to optimize health outcomes.

As future healthcare professionals, proficiency in understanding and managing gastrointestinal and nutritional disorders is paramount to your ability to provide comprehensive patient care. By mastering the content of this module, you will lay the foundation for your clinical practice and develop the skills necessary to address the diverse needs of patients with gastrointestinal and nutritional concerns.

We encourage you to approach this module with enthusiasm and dedication, as the knowledge and skills you acquire will not only enhance your academic prowess but also empower you to make a meaningful difference in the lives of your future patients.

# 4.1. Module Rationale

Endocrinal system is a unique system consists of glands which control body systems through its secretions known as hormones. These chemical compounds known as hormones play an integral role in maintaining cell activity and organ functions through biochemical signals. Human reproduction is controlled by hormones released by gonads. Changes in hormonal levels can affect human fertility. In this module the anatomy and physiology of the endocrine organs, functional biochemistry of the hormones secreted will be taught in integrated fashion with reference to common disease occurring in Pakistani community.

## 4.2. Module Outcomes

- Explain Development, structure, hormones and regulation of pituitary gland, thyroid gland, parathyroid gland, endocrine pancreas, adrenal glands, testes and ovaries.
- Describe the etiology, pathophysiology, relevant clinical features and common investigations of disorders of these glands.
- Apply levels of prevention for common endocrinal public health issues in Pakistan.
- Elaborate events in normal pregnancy and principles of genetics.

# 4.3. Learning Objectives

## 4.3.1. Knowledge

**Anatomy**

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Gross Anatomy** | Diencephalon (Endocrinology) | • Describe the location, anatomy blood supply and functions of pituitary gland |
| | Thyroid & Parathyroid gland | **Describe** the Thyroid, Parathyroid with their type, Relations, blood supply, and nerve supply.<br><br>Thyroid & Parathyroid gland Explain the anatomical basis for surgical removal of the glands of neck with special emphasis on the complications that can be encountered<br><br>Identify the Thyroid with their type, relations, blood supply, and nerve supply |
| | Testis | Describe the structure, fascia, coverings, blood and nerve supply of testis |
| | Accessory Male organs | Describe the gross anatomical features and neurovasculature of epididymis and vas deferens, Seminal vesicles, Bulbourethral gland |
| | Prostate | Describe the morphological features and neurovascular supply of prostate. Describe, Draw & Label Lobes of prostate gland Correlate the clinical manifestations of prostate with lobes and/or zones of prostate |
| | Testis clinical conditions | Describe the anatomical basis and manifestations of the following conditions: 1) Hydrocele of spermatic cord and/or testes 2) Hematocele of testes 3) Torsion of the spermatic cord 4) Varicocele Vestigial remnants of embryonic genital duct<br><br>Describe the anatomical basis of vasectomy, &metastasis of cancer of testis and scrotum. |
| | Supra-Renal Gland | Describe shape, relations blood supply & nerve supply of suprarenal gland |

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| | | Explain the anatomical causes of Adrenal Abnormalities |
| | Pelvic Girdle | Define Bony Pelvis (Girdle) and describe the structures forming it. |
| | Sacroiliac Joint | Describe the bones and salient anatomical features of Bony pelvis (girdle) |
| | Bony Pelvis (Girdle) | Describe the type, articulations and mechanics of movements {axes and planes} of the following joints:<br>1) Sacro-Iliac 2) Pubic Symphysis 3) Lumbosacral 4) Sacrococcygeal |
| | | List the contents of True and False Pelvis |
| | | Tabulate the differences between male and female pelvis |
| | | Describe different types of pelvises |
| | | Describes different diameters of pelvis and their application in obstetric practice. |
| | Pelvic Girdle | |
| | | Describe the anatomical basis of pelvic fractures and their consequences |
| | | Describe the topographical anatomy of pelvic walls and its components |
| | Pelvic floor | Describe the mechanics of changes occurring in pelvic ligaments and joint mobility in late pregnancy |
| | | Describe the topographical anatomy of pelvic floor. |
| | Pelvic Muscles | Describe origin, insertion, nerve supply and actions of Pelvic floor muscle forming pelvic floor |
| | Pelvic Girdle | Tabulate the attachments, innervations and actions of muscles forming the pelvic walls and floor |
| | Peritoneum peritoneal cavity of pelvis | Describes injury to pelvic floor during child birth and its complications |
| | Sacrum<br>Pelvic Fascia<br>Pelvic Outlet and inlet | Describe the peritoneal reflections in the male and female pelvis |
| | | Describe the gross anatomical features of Sacrum |
| | | Describe the gross anatomical features of pelvic fascia |
| | | Describe the boundaries of pelvic outlet and inlet |
| | | Enumerate the structures passing through the pelvic inlet and pelvic outlet |

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| | Peritoneal Reflection in Pelvis<br>Pelvic Vessels<br><br><br><br><br>Pelvic Lymph Nodes<br><br><br>Pelvic Vessels & Pelvic nerves<br><br><br><br><br><br><br><br>Pelvis | • Tabulate the differences in peritoneal reflections in male and female pelvis<br>• Describe the origin, course, branches and distribution of common iliac artery<br>• Describe the origin, course, branches and distribution of external and internal iliac arteries<br>• Describe the origin, course, tributaries and area of drainage of pelvic veins<br>• Describe the location, afferents and efferent of pelvic lymph nodes<br>• Tabulate the origin, course, distribution and anastomosis of arteries of the pelvis<br>• Describe the origin, root value, course, relations, branches and distribution of Pelvic nerves<br>• Describe the anatomical basis and clinical picture for ligation of internal iliac artery and collateral circulation in pelvis<br>• Describe the clinical picture and anatomical basis for the injury to pelvic nerves<br>• Give anatomical justification for pelvic nerve blocks<br>• Describe the morphological features of urethra (male and female)<br>• Tabulate the parts of the male urethra with their location and salient features<br>• Describe the clinical picture and anatomical justification for Ureteric Caliculi, Cystocele, Suprapubic Cystotomy, Rupture of Bladder<br>• Describe the clinical picture and anatomical justification for Hypertrophy of Prostate<br>• Describe the gross anatomical features of Ovaries and Fallopian Tubes with their relations, blood supply, nerve supply and lymphatic drainage<br>• Describe related clinical conditions: 1) Positions of ovaries 2) Cysts of ovaries 3) Ectopic pregnancy 4) Tubal ligation 5) Salpingitis<br>• Describe the gross anatomical features, parts, peritoneal ligaments, blood supply, nerve supply & lymphatic & clinical aspects of Uterus and Vagina Describe related clinical conditions<br>• 1. Prolapse of uterus<br>• 2. Vaginal trauma<br>• 3. culdocentesis<br>• Describe, identify, justify and demonstrate the supports of uterus |
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| | Perineum | Describe the gross anatomical features of Boundaries & divisions of perineum<br>Draw and label the boundaries of perineum<br>List the contents of perineum Anatomy<br>Tabulate the differences between the Male and female<br>Describe the attachments of the perineal membrane and list its relations<br>Discuss the formation of Superficial and Deep Perineal Pouches<br>List the contents of Superficial and Deep Perineal Spaces<br>Tabulate the attachments, actions and nerve supply of muscles of perineum<br>Describe the topographical anatomy and neurovasculature of Penis Anatomy Tabulate the muscles forming the perineal body with their attachments and nerve supply |
| | Esophagus | • |
| | Stomach | • Describe the location, position, parts, external and internal structure, relations, vascular and nerve supply and lymphatic drainage of stomach<br>• Draw and label a diagram illustrating the lymphatic drainage ofStomach<br>• Describe the clinical presentation and the anatomical basis and manifestations of the followingconditions:<br>Carcinoma of stomach and peptic ulcers<br>• Identify and demonstrate the parts,external and internal features of stomach on anatomical model andcadaver |
| | Small & Large Intestine | • Describe the location, position, parts, relations, neurovascular supply andlymphatic drainage ofduodenum<br>• Describe the anatomical basis and manifestations of the following conditions: DuodenalUlcers<br>Ileal diverticulum<br>Diverticulosis<br>Large bowel cancer |

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| | | Appendicitis<br>Volvulus<br>Intussusception<br>• Demonstrate the various positions of appendix<br>• Identify and demonstrate the Parts and external features of small and largeintestines on anatomical model andcadaver |
| | Liver | • Describe the origin, course, branches (tributaries in case of veins) and distribution of the blood vessels ofGIT<br>• Describe the formation, tributaries and drainage of hepatic-portalvein<br>• Discuss the sites and vessels contributing in portosystemicanastomosis<br>• Describe the clinical picture andanatomical basis for the blockage of Porto-systemic anastomosis<br>• Identify the blood vessels supplying GITon anatomical model and cadaver<br>• Describe location, lobes, important relations, peritoneal ligaments, blood supplylymphatic drainage, nerve supply, related clinical correlates of liver and sub phrenic spaces. |
| | Biliary System | • Describe components of Biliary tree-hepatic duct and bileduct<br>• Describe relations, functions, blood supply, lymphatic drainage and nerve supply of Gallbladder<br>• Describe related clinical correlates-gall stones, biliary colic, cholecystectomy, gallbladder gangrene |
| | Pancreas | • Describe the location, surfaces, peritoneal reflections, relations, neurovascular supply and lymphatic drainage ofpancreas<br>• Describe the anatomical basis and manifestations of pancreatitis and pancreatic cancer<br>• Identify the parts of thepancreas |
| | Spleen | • Describe the location, surfaces, peritoneal reflections, relations, neurovascular supply and lymphatic drainage ofspleen<br>• Describe the anatomical basis and manifestations of splenic trauma and splenomegaly |

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| | | • Identify the borders, surfaces and Impressions of spleen<br>• Demonstrate the correct anatomical positioning of spleen. |
| | Sigmoid Colon, Rectum & Anal Canal | • Describe the gross anatomical features, peritoneal relations, blood supply, nerve supply and lymphatic drainage of sigmoid colon, rectum and anal canal.<br>• Describe the anatomical basis for Sigmoidoscopy, rectal prolapse, rectal examination, rectal cancer and hemorrhoids |
| | Surgical Intervention | • Outline the anatomical basis and surgical treatment plan for the following diseases: Esophageal Injuries<br>Gastric Carcinoma<br>Intestinal Obstruction<br>Pancreatic Carcinoma<br>Obstructive Jaundice<br>Gall Stones |
| **Embryology & Post-Natal Development** | Oral Cavity | • Describe the development of tongue<br>• Describe the embryological basis of tongue tie<br>• Describe the development of palate<br>• Describe the embryological basis of various facial clefts<br>• Identify the parts of the developing tongue and palate |

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| | Foregut | • Describe the formation and divisions of gut tube<br>• Describe the development of mesenteries<br>• Describe the development of esophagus<br>• Describe the embryological basis of esophageal atresia and/or tracheoesophageal fistula<br>• Describe the development and rotation of stomach<br>• Describe the embryological basis of pyloric stenosis<br>• Describe the development of duodenum, liver and gall bladder<br>• Describe the embryological basis of intrahepatic and extrahepatic biliary atresia<br>• Describe the development of pancreas<br>• Describe the embryological basis of annular pancreas |

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| | Midgut | • Describe the embryological basis of the following<br>mobile cecum<br>volvulus<br>retro colic hernia<br>Omphalocele<br>gastroschisis |
| | Hindgut | • Describe the embryological basis of Meckel's diverticulum<br>• Describe the embryological basis of; Gut rotation effects<br>Gut atresia and stenosis<br>• Describe the development of hindgut<br>• Describe the embryological basis of;<br>Recto urethral and rectovaginal<br>fistulas Recto anal fistulas and atresia<br>Imperforateanus<br>Congenital mega colon<br>• Identify the parts of the developing foregut, midgut and hindgut originating from the endoderm |
| **Microscopic Anatomy (Histology & Pathology)** | Oral Cavity & Esophagus | • Describe the light microscopic structure of; Lips<br>Tongue including lingual papillae and taste buds<br>Oral Cavity (Cheeks, Teeth gums, hard & Soft palate)<br>• Describe the histological structure of parotid, submandibular and sublingual glands.<br>• Compare and contrast the histological structures of parotid, submandibular and sublingual glands.<br>• Describe the serous and mucous acini and give histological differences between the two.<br>• Describe the structure and location of serous Demilune.<br>• Describe histology of oropharynx<br>• Relate the characteristics of various layers of GIT with their function<br>• Describe the light microscopic structure of esophagus<br>• Tabulate the histological differences between different parts of esophagus<br>• Describe the histological changes associated with reflux esophagitis and |

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| | | Barrett's |

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| | | esophagus |
| | Stomach | • Describe the light microscopic structure of stomach<br>• Describe the role of parietal cells in pernicious anemia |
| | Small Intestine | • Describe the light microscopic structure of Duodenum<br>Jejunum<br>Ileum<br>• Discuss the histological basis of celiac disease<br>• Discuss the histological basis of Crohn's disease |
| | Large Intestine | • Describe the light microscopic structure of Colon<br>Appendix<br>Rectum<br>• Define colorectal cancer, anal abscess, hemorrhoids |

## Physiology

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Medical Physiology** | General Principles of GIT Function - Motility, Nervous Control & Blood Flow | • Classify the components of enteric nervous system<br>• Discuss the location and significance of myenteric plexus<br>• Describe the Meissner's plexus<br>• Differentiate between myenteric and Meissner's plexuses<br>• Explain the mechanism of developing slow wave<br>• Explain the mechanism of developing spike potential<br>• Enlist the factors that depolarize &hyperpolarize the GIT membrane<br>• Enlist the excitatory & inhibitory neurotransmitters of enteric nervous system<br>• Explain the role of sympathetic &parasympathetic nervous system in controlling GIT function.<br>• Enlist the gastrointestinal reflexes & explain the functions of these reflexes<br>• Enlist the hormones acting on GIT, their stimuli, site of release and actions<br>• Enumerate different types of movements that occur in GIT<br>• Discuss the functions and control of GIT movements<br>• Discuss the effect of gut activity and metabolic factors on GIT blood flow<br>• Explain the nervous control of GIT blood flow |
| | Oral Cavity & Esophagus | • Trace the reflex arc of mastication<br>• Explain the process and importance of chewing reflex<br>• Enlist the stages of swallowing<br>• Describe the mechanism of voluntary stage of swallowing<br>• Trace the reflex arc of involuntary stage of swallowing<br>• Enlist the steps involved in the involuntary stage of swallowing<br>• Explain the effect of swallowing on |

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| | | respiration<br>• Discuss the mechanism of oesophagal stage of swallowing<br>• Enlist causes of dysphagia<br>• Explain the types and roles of different peristalsis originating in the esophagus<br>• Discuss the role of Lower Esophageal Sphincter(Gastroesophageal)<br>• Discuss the pathophysiology of achalasia &Mega esophagus<br>• Enlist the features and treatment of achalasia |
| | Stomach | • Explain storage function of stomach<br>• Describe the basic electrical rhythm of stomach wall<br>• Explain the role of pyloric pump and pyloric sphincter in gastric emptying<br>• Explain the factors that promote Stomach Emptying<br>• Discuss the duodenal (nervous & hormonal) factors that inhibit Stomach emptying<br>• Enlist the factors that initiate enter gastric inhibitory reflexes<br>• Enumerate the causes, features, and pathophysiology of gastritis<br>• Explain the physiological basis of each feature of gastritis<br>• Recommend treatment of gastritis<br>• Enumerate the causes, features, and pathophysiology of peptic ulcer<br>• Explain the physiological basis of each feature of peptic ulcer |
| | Small Intestine | • Enumerate and explain the hormones and movements of small intestine<br>• Explain the term “peristaltic crush”<br>• Explain the functions of ileocecal valveand sphincter<br>• Enumerate the types of intestinalsprue<br>• Enlist the features of intestinalsprue<br>• Explain the consequences of sprue on thebody |

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| | Large Intestine | • Enumerate the types of movements taking place incolon<br>• Explain the mechanism of developing movementsof colon and their control<br>through Gastrocolic and Duodenocolic Reflexes |

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| | | • Enlist the defecationreflexes<br>• Explain the mechanism of defecationreflex<br>• Trace the reflex arc ofdefecation<br>• Name the other autonomic reflexes that affect bowelactivity<br>• Explain the pathophysiology ofconstipation<br>• Discuss the causes ofdiarrhea<br>• Describe the cause of Hirschsprung'sdisease integrate with Medicine |
| | Liver | • Explain the functions ofliver<br>• Differentiate between liver and gallbladder bile and the hormones acting onthem<br>• Enumerate the causes and composition of developing gallstones |
| | Pancreas | • Explain function and secretions ofpancreas<br>• Enlist the causes and pathophysiology ofacute and chronicpancreatitis<br>• Enumerate the features of acute pancreatitisand explain the physiological basis of each feature of pancreatitis |
| | Vomiting Reflex | • Describe the stages of vomitingact<br>• Trace the reflex arc ofvomiting<br>• Explain the role of chemoreceptor trigger zone for initiation of vomiting by drugs orby motion sickness |
| | Malnutrition | • DefineMalnutrition<br>• Identify various causes ofmalnutrition<br>• Identify the risk factors ofmalnutrition<br>• Outline treatmentstrategies |
| | Acute & Chronic Diarrhea | • Define AcuteDiarrhea<br>• Define ChronicDiarrhea<br>• Enlist various causes for acute andchronic diarrhea |

## Medical Biochemistry

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Medical Biochemistry** | Biochemistry of GIT /GIT secretions & digestion and absorption of dietary carbohydrates | • Give the composition and importance of saliva and related clinical disorder (xerostomia)<br>• Give the composition and importance of gastric juice with special reference to mechanism of HCl secretion and related clinical disorders (achlorhydria, gastriculcer<br>• Give the composition and importance of pancreatic juice, bile and succusentericusand related clinical disorders (pancreatitis, cystic fibrosis,cholelithiasis).<br>• Describe digestion and absorption of dietary carbohydrates along with inherited and acquired disorders (lactose intolerance, sucrase-isomaltasedeficiency). |
| | Carbohydrate metabolism/ Entry of glucose into cells | • Elaborate key features of various transport systems for entry of glucose intocells. |
| | Carbohydrate metabolism/ Hormonal control of BSL | • Enlist the hormones that play important roles in regulating carbohydratemetabolism.<br>• Elaborate the metabolic effects of these hormones.<br>• Infer the consequences of deficiency and excess of thesehormones |
| | Carbohydrat e metabolism/ Glycolysis | • Describe the glycolytic pathway alongwith its regulation andsignificance.<br>• Compare key features of aerobic and anaerobicglycolysis.<br>• Calculate the number of ATP produced during aerobic and anaerobicglycolysis.<br>• Explain hemolytic anemia in subjects with pyruvate kinase deficiency based on your biochemicalknowledge.<br>• Clearlydifferentiate between substrate level Phosphorylation and oxidative phosphorylation. |
| | Carbohydrate metabolism/ Metabolic fates of pyruvate | • Discuss the metabolic fates ofpyruvate.<br>• Describe the transport of pyruvate from cytosol to mitochondria.<br>• Elaborate the reaction catalyzed by |

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| | | pyruvate dehydrogenase complex (PDH) alongwith |

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| | | regulation and significance.<br>• Enlist inherited and acquired causes of lactic acidosis and give biochemical explanation for lactic acidosis in eachcondition. |
| | Carbohydrate metabolism/ Kreb's Cycle | • Describe the TCA cycle along withregulation & significance. Calculate the energy yield of TCA |
| | Carbohydrate metabolism/ Gluconeogenesis | • Define gluconeogenesis and enumerate gluconeogenic substrates(precursors)<br>• Delineate the reactions involved in synthesis of glucose from various gluconeogenic substrates.<br>• Elaborate the regulation and importance of gluconeogenesis.<br>• Explain the significance of Cori cycle and glucosealaninecycle |
| | Carbohydrate metabolism/ Glycogen metabolism | • Illustrate the reactions of glycogenesis, glycogenolysis along with their regulation andsignificance<br>• Enlist various types of glycogenstorage diseases(GSDs)<br>• Infer the key biochemical and clinical features of various GSDs from the respective enzymedeficiencies. |
| | Carbohydrate metabolism/ HMP Hexose Monophosphate Pathway | • Describe the reactions and regulation of Hexose Mono Phosphate Pathway(HMP).<br>• Discuss the importance of HMPshunt<br>• Explain hemolytic anemia in subjects suffering from G6PDdeficiency.<br>• Diagnose G6PD (glucose-6-phosphate dehydrogenase) deficiency based on given data. |
| | Carbohydrate metabolism/ Uronic acid pathway & sorbitol pathway | • Describe the reactions, regulation, and biomedical importance of uronic acid pathway and sorbitolpathway |

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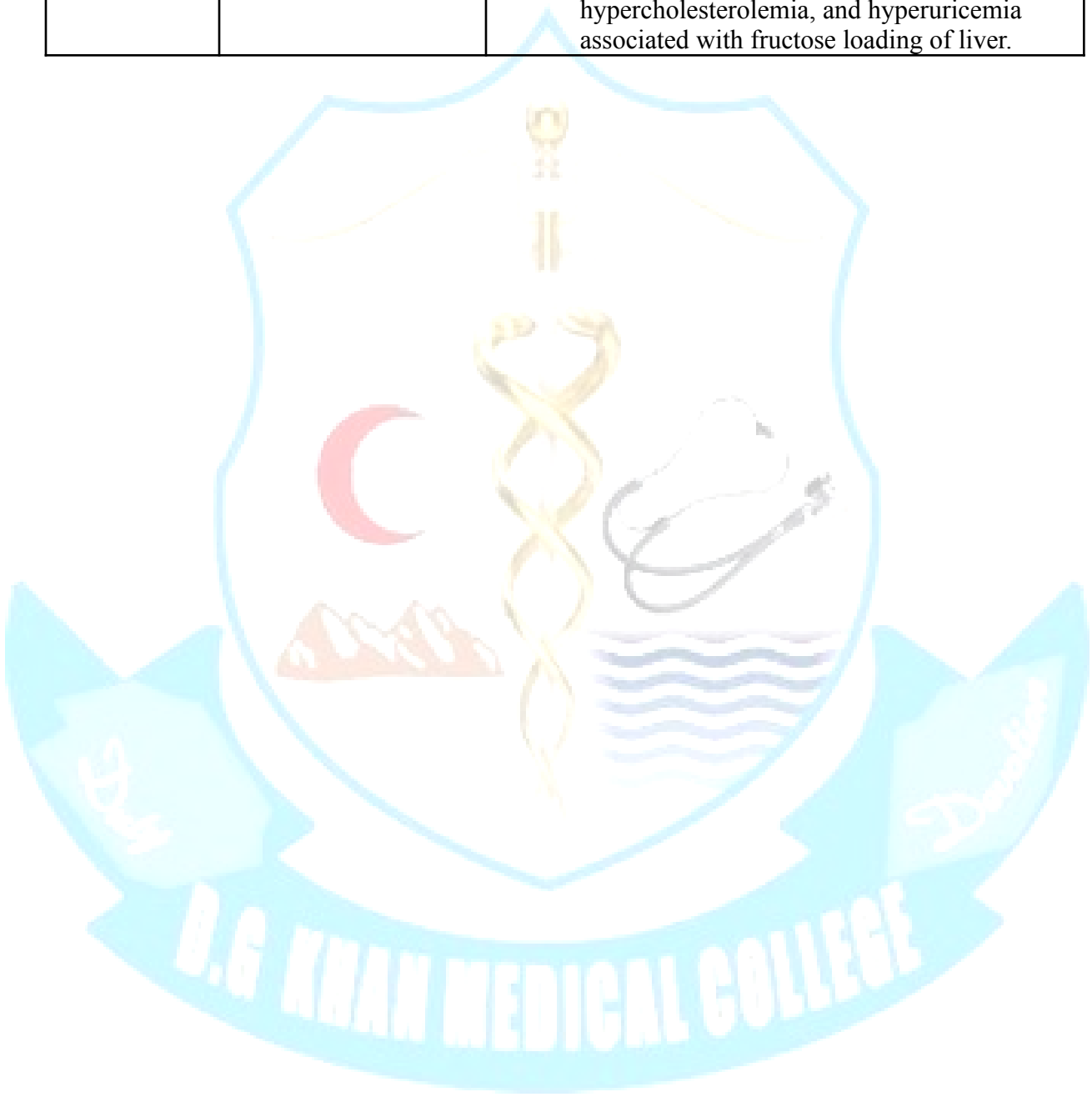
| | Carbohydrate metabolism/ Metabolism of galactose & fructose | • Outline the reactions involved in metabolism of galactose andfructose.<br>• Infer the key biochemical and clinical features of galactosemia, essentialfructosuria, and hereditary fructose intolerance (HFI) from the respective enzymedeficiencies.<br>• Explainhypertriacylglycerolemia, hypercholesterolemia, and hyperuricemia associated with fructose loading of liver. |



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| | Carbohydrate metabolism/ Ethanol metabolism | • Outline the reactions involved in ethanol metabolism.<br>• Explain how ethanol consumption causes hypoglycemia and fattyliver. |
| | Respiratory chain & oxidative phosphorylation /ETC | • Diagrammatically illustrate the organization of electron transport chain (ETC) depicting the flow ofelectrons<br>• Enlist the components of complex I, II, III, andIV<br>• Enumerate clinically important inhibitors of electron transport chain and mention their site ofaction. |
| | Respiratory chain & oxidative phosphorylation /ATP synthesis | • Elaborate the structure of ATP synthase (complexV).<br>• Explain how the free energy generated by the transport of electrons by ETC is used to produce ATP from ADP + Pi (i.e. chemiosmotichypothesis)<br>• Elaborate the effect of oligomycinand uncouplers on ATP production.<br>• Describe the effect of arsenic poisoning on carbohydrate metabolism and ATP production.<br>• Elaborate the glycerol 3-P shuttle and malate-aspartate shuttle for the transferof reducing equivalents from cytosol into the mitochondria. |
| | Nutrition/ Balanced diet | • Define and classify nutrients into macro and micronutrients.<br>• Elaborate the concept and importance of BalancedDiet<br>• Enlist the components of balanced diet and elaborate the importance of eachcomponent. |
| | Nutrition/ Special nutritional requirements | • Delineate special nutritional requirements during pregnancy, lactation, growth, and old age.<br>• Suggest dietary advice for patients suffering from diabetes mellitus, hypertension, obesity, renal disease,lactose intolerance, gluten enteropathy, hypercholesterolemia, and hemorrhoids. |
| | Nutrition/ PEM | • Enlist causes and types of Protein Energy Malnutrition (PEM).<br>• Differentiate between Kwashiorkorand |

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| | | Marasmus based on the given data<br>• Enlist symptoms andsigns<br>• Outline treatmentstrategies |
| | Nutrition/ Caloric requirements | • Define energybalance.<br>• Compare the energy content of macro nutrients andalcohol.<br>• Suggest a simple method for estimation of caloric requirements of sedentary adults, moderately active adults, and very active adults |
| | Nutrition/ BMR | • Define basal metabolic rate(BMR)<br>• Elaborate the effect ofvariousphysiological and pathological factors on BMR. |
| | Nutrition/ BMI & Obesity | • Define body mass index(BMI).<br>• Categorize individuals into underweight, normal, overweight, obese, and morbidly obese based on theirs BMIvalues.<br>• Elaborate the role of genetic,environmental, and behavioral factors in determining body weight.<br>• Clearly differentiate between upper body obesity and lower bodyobesity.<br>• Enlist health risks associated withobesity. |
| | Vitamins/ Energy releasing vitamins & vitamin E and K | • Describe sources, Recommended Dietary Allowance (RDA), biochemical functions, deficiency, and toxicity of vitamin B1, B2, B3, B5 andB7.<br>• Describe sources, RDA, biochemical functions, deficiency, and toxicity ofvitamin E and vitamin K. |
| | Minerals | • Define and classify minerals according to their dailyrequirements.<br>• Give sources, functions and biomedical importance of Na, K and Cl.<br>• Describe sources, functions and biomedical importance of Mg, Se, I, F, Cu, Cr, Mn, Mo, Zn andCo. |
| | Malnutrition | • Define Marasmus andKwashiorkor |

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| | Acute & Chronic Hepatitis | • Define AcuteHepatitis<br>• Define ChronicHepatitis<br>• Enlist various causes for acute and chronic hepatitis<br>• Describe various symptoms and signs of chronichepatitis<br>• Outline treatmentstrategies |

## Aging

| Topic | Sub Topic | Learning objectives |
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| **Aging** | Preventive Medicine in Geriatrics | • Identify causes and risk factors for malnutrition in elderly<br>• Outline treatment strategies |

## Pathophysiology and Pharmacotherapeutics

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Pharmaco-therapeutics** | Anti-Diarrheal Drugs | • Classify anti diarrheal drugs and describe the pharmacokinetics, mechanism of action, pharmacological effects, uses and adverse effects |
| **Pathophysiology** | Peptic Ulcer | • Describe the etiology, pathogenesis, morphology and clinical features of peptic ulcer disease |
| | Infectious agents causing Diarrhea | • Enumerate common infectious agents of diarrheal diseases<br>• Discuss pathogenesis and clinical features of common pathogens |

## Disease Prevention & Impact

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Behavioral Sciences** | Health related behaviors | • Identify health related behaviors and apply principles of learning to modify eating and addictive patterns |
| | Health related believes | • Discuss health belief model and its application in managing common presentations related to gastro-intestinal system<br>• Explain the trans theoretical model of changing behaviors to modify the diseases pattern |

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| | Management of Obesity | • Describe motivational interviewing and outline a management plan to help the individuals with obesity and diabetes to lose weight |

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| | Medically Un described Symptoms | • Describe and distinguish Medically Un described Symptoms(MUS)<br>• Describe the association of psychosocial factors with MUS<br>• Outline the principles of management plan according to biopsy chosocial model Describe role of Cognitive Behavioral Therapy(CBT) |
| | Role of nutritional deficiencies in mental development | • To identify effect on mental development of nutritionaldeficiencies |
| | Epidemiology of communicable diseases (Intestinal infection) | • Describe prevention and control of polio, viral hepatitis A, cholera, typhoid and food poisoning<br>• Describe prevention and control of amoebiasis, ascariasis, hook worminfestation |
| **Community Medicine** | Preventive medicine in pediatrics | • Describe the advice to be given for breast feeding, weaning andchildhood<br>• Discuss risk factors, prevention and management of protein energy malnutrition (PEM) |
| | Nutrition & Health | • Describe balanced diet for adult andobesity<br>• Plot and interpret growth chart for children under 5 years ofage<br>• Describe prevention and control of deficiency of Vitamin A andD |
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## 4.3.2. Skills

### Practical

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Histology** | Oral Cavity | • Identify, draw and label the histological sections of Tongue and Lips and enumerate points ofidentification |
| | Salivary Gland | • Identify, draw and label thehistological sections of Salivary glands (Submandibular, Sublingual and Parotid) |
| | Upper GIT | • Identify, draw and label the histological structure of the esophagus and enumerate points ofidentification<br>• Identify, draw and label the histological structure of stomach and enumerate points of identification |
| | Small Intestine | • Identify, draw and label the histological structure of small intestine (Duodenum, Jejunum, and Ileum) and enumerate points of identification |
| | Large Intestine | • Identify, draw and label the histological structure of large intestine and enumerate points of identification |
| | Organs associated with GIT | • Identify, draw and label the histological sections of Gall bladder, liver and enumerate points of identification |
| | Organs associated with GIT | • Identify, draw and label the histological sections of pancreas and enumerate points of identification |
| | Lymphatic tissue associated with GIT | • Identify, draw and label the histological sections of Palatine tonsil, appendix, peyer's patches and enumerate points of identification |

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| **Biochemistry** | Estimations of blood/urine analyses | • Estimate blood glucose level by glucose oxidase method and interpret the results<br>• Determine blood glucose level by glucometer and interpret the result.<br>• Perform Glucose tolerance test (GTT) and interpret the results.<br>• Determine urine glucose by dipstick method and interpret the result.<br>• Estimate serum amylase and interpret the result. |

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| | Interpretation of results | • Interpret the results of Lactose tolerance test. |
| | Determination & interpretation of results | • Determine BMI of given subject and interpret the results. |
| | Cranial nerve | • Demonstrate Cranial nerve V, IX & X testing |

## 4.3.3. C-FRC for GIT and Nutrition-1Module

| GIT AND NUTRITION-1 MODULE | | |
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| **Objectives** | **Skill** | **Miller's Pyramid Level Reflected** |
| Demonstrate steps of abdominal examination | Abdominal Examination | Shows |
| Demonstrate the procedure of shifting dullness | shifting dullness | Shows |
| Identify organs on X-ray abdomen | X-ray Abdomen | Shows |
| Assess dehydration in infant/young child and explain procedure of making home made ORS | Dehydration | Does |

# RENAL-1 MODULE

# 5. Introduction of Head n Neck and Special Senses-1Module

This module has been designed for students to introduce them to the basic concepts of head and neck and special senses. This module includes Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Community medicine and Behavioral sciences. Lectures, tutorials, small group sessions including CBL and practical are important components of this module. History taking, as part of clinical skills, is included in this module. Your co-operative and teamwork abilities will be improved by working in different teams. You will be able to develop problem solving skills to apply your medical knowledge to practical situations by means of group and individual tasks. This study guide has been developed to assist you and keep you focused to achieve your goals.

# 5.1. Module Rationale

The second year MBBS students will have a detailed understanding of the anatomy, physiology, and clinical aspects of the Head and Neck, Special Senses. This knowledge is critical for the diagnosis and treatment of a wide range of diseases associated with these senses.

This module covers the important structures and functions of the Head & Neck, eye, ear, tongue, nose, as well as the pathologies and treatments associated with them. This includes common conditions such as cataracts, glaucoma, aging changes, hearing loss, tinnitus, otitis media, and olfactory disorders.

Additionally, the special senses module includes training in relevant clinical examination skills, such as ophthalmoscopy, otoscopy, rhinoscopy, and vestibular testing. These skills are essential for identifying and diagnosing special senses conditions, and for monitoring the effectiveness of treatments.

An understanding of these structures is important for the general practice of medicine as they play a critical role in the overall health and well-being of patients. For example, vision and hearing loss can lead to a decline in cognitive function and social isolation, while smell and taste disorders can affect appetite and nutrition.

# Module Outcomes

- Integrate the anatomical and pathophysiological aspects of the Head & Neck, eye, ear, nose, tongue, vestibular system and the neural pathways, receptors involved in their function with the clinical aspects.
- Develop the ability to identify and diagnose common pathologies such as cataracts, glaucoma, and age-related degeneration, hearing loss, impacted wax, otitis media and olfactory disorders.
- Demonstrate the clinical examination (simulation) skills necessary for the assessment of special senses, such as ophthalmoscopy, otoscopy, rhinoscopy, and vestibular testing.
- Differentiate the differential diagnosis and options available for special senses conditions, including medical, surgical, and rehabilitative approaches.
- Illustrate awareness of the impact on overall health and well-being, the importance of preventing and early detection of related disorders.
- Develop the ability to communicate effectively with patients and their families, including explaining diagnosis and treatment options, and providing emotional support.
- Practice the attitude to work in a multidisciplinary team, collaborating with other healthcare professionals to provide comprehensive care for patients.

Equip themselves with the ability to appreciate the significance of lifelong learning and professional development to keep up with latest advances in the clinical field.

# 5. Learning Objectives

## 5.2.1. Knowledge

### Anatomy

| Topic | Sub Topic | Learning objectives |
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| **Gross Anatomy** | Vision | • Define the boundaries and openings of orbital cavity. List orbital contents and structures traversing these openings.<br>• In a tabulated manner list the extraocular and intraocular muscles of eyeball giving their nerve supply and actions<br>• List and define the movements of eyeball with special reference to orbital and visual axis<br>• Describe the functional modalities, course, distribution, branches of oculomotor, trochlear and abducent nerve. Describe the location, roots and distribution of ciliary ganglion.<br>• Describe the course and distribution of optic nerve in reference to visual pathway. Give the effects of its lesions.<br>• Give the clinical correlates of nerves supplying the eyeball and its muscles.<br>• Give anatomical justification for Horner's syndrome.<br>• Describe the course and branches of ophthalmic artery mentioning its origin and termination.<br>• Describe the structure of eyelids, conjunctiva and tarsal glands with their neurovascular supply<br>• List the parts of Lacrimal apparatus giving their location and anatomical features. Describe the nerve supply of lacrimal gland.<br>• Describe the location, roots and distribution of pterygopalatine ganglia.<br>• Give the anatomical structure of eyeball emphasizing on its three coats and their neurovascular supply<br>• Describe the boundaries of nasal cavity: nasal septum, lateral wall of nose, roof and floor.<br>• Give their anatomical features and neurovascular supply. |

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| | Olfaction | • Describe the anatomical features and neurovascular supply of external nose<br>• List the paranasal sinuses giving their locations, openings, neurovascular supply and clinical significance.<br>• Describe the course and distribution of olfactory nerve in reference to olfactory pathway. Give the effects of its lesions.<br>• Describe the anatomical features and neurovascular supply of external ear |
| | Urinary bladder | • Describe the gross anatomical features, relations, surfaces, blood supply, nerve supply and lymphatics of urinary bladder<br>• Give the clinical corelates of urinary bladder<br>• Identify the gross features and surfaces of urinary bladder |
| | Sign/symptom/investigations | • Interpret basic urological signs/symptoms &investigations. |
| | Urinary retention | • Describe the etiology, and management of urinary retention. |

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| | Radiograph | • Identify and describe the various anatomic landmarks of the renal system onradiographs. |
| | Urethra | • Describe the parts ofurethra. |
| **Embryology & Post-Natal Development** | Development of a urinary system | • Describe the development of intermediate mesoderm and its derivatives<br>• Describe the development of pronephros, mesonephrosand metanephros<br>• Describe positional changes during descent of kidney with correlation to its blood supply<br>• Describe the development of urinary bladder andurethra<br>• List and describe the common congenital anomalies of kidney, urinary bladder andurethra. |
| **Microscopic Structure Histology** | Structure of kidney | • Describe the histological, structural organization and functions of kidney withclinicals. |
| | Juxtaglomerular apparatus | • Describe the light and ultrastructure of the Juxtaglomerular apparatus and glomerular filtrationbarrier. |
| | Structure of ureter | • Describe the histological structure of ureter |
| | Structure of urinary bladder | • Describe the histological structure of urinarybladder<br>• Discuss clinical correlates (Cystitis, Urinary bladder cancer, Urinary Tract Infections(UTIs). |

## Physiology

| Topic | Sub Topic | Learning objectives |
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| **Medical Physiology** | Body fluid compartment | • Describe major composition ofintracellular and extracellularfluids<br>• Define Hypo andhypernatremia<br>• Explain the causes of hypo & hypernatremia and their effects on Composition of body fluidcompartments<br>• Describe difference between iso-osmotic, hyperosmotic, hypo-osmoticfluids |
| | Edema | • Enumerate causes of Intracellular and extracellularedema<br>• Describe safety factors that preventedema |
| | Function | • Explain the functions of thekidney |
| | Micturition reflex | • Describe the mechanism of micturition and itscontrol<br>• Explain the role of higher center on micturition<br>• Explain the physiological anatomy and innervation ofbladder<br>• Discuss the voluntary control ofmicturition |
| | Abnormalities of micturition | • Explain the causes, pathophysiology, and features of atonicbladder.<br>• Discuss the causes, pathophysiology, and features of automaticbladder.<br>• Write the causes, pathophysiology,and features of uninhibited neurogenic bladder |
| | Urine formation | • Enlist the steps of urineformation.<br>• Explain the physiological anatomy and functions of glomerular capillary membrane<br>• Discuss the composition offiltrate<br>• Explain the minimal change nephropathy and increase permeability to plasmaprotein |

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| | Glomerular filtration | • Define Glomerular Filtration Rate(GFR).<br>• Describe the determinants ofGFR<br>• Explain the factors affecting GFR Discuss the hormones and autocoids that affect GFR<br>• Explain mechanisms of autoregulation of GFR<br>• Enlist the physiological andpathological factors that decreaseGFR<br>• Explain the effects of angiotensin II blocker on GFR during renal hypoperfusion |
| | Reabsorption | • Enumerate different types of transport along the kidney tubules forreabsorption<br>• Explain the reabsorption and secretion along different parts of theNephron<br>• Explain the regulation of tubular reabsorption<br>• Discuss the forces/pressure andhormones that<br>• Determine renal tubularreabsorption<br>• Explain the reabsorption of water along different parts ofnephron<br>• Define obligatory and facultative reabsorption<br>• Discuss the characteristics of late distal tubules and cortical collectingducts<br>• Discuss the characteristics ofmedullary collecting ducts |
| | Clearance method | • Explain the use of clearance method to quantify kidneyfunction |
| | Transport maximum | • Describe mechanism of re-absorption of sodium along different partsnephrons<br>• Define and explain the term Transport maximum for thesubstances<br>• Define filtered load for thesubstance<br>• Justify the difference of transport maximum and renal threshold of glucose in |

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| | | renal tubules |
| | Urine concentration and dilution | • Explain the renal mechanisms for excreting Diluteurine<br>• Explain the mechanism for forming a concentratedurine<br>• Discuss the role of urea in the process of counter current multipliermechanism<br>• Describe the countercurrent exchangein vasa Recta to preserve hyperosmolarity of renal medulla |
| | Obligatory urine volume | • Define and explain the term obligatory urinevolume.<br>• Define and explain free waterclearance.<br>• Define Urine specificgravity. |
| | Disorders of urine concentrating ability | • Enumerate different abnormalities of urinary concentratingability |
| | Diabetes insipidus | • Enumerate the types of Diabetesinsipidus<br>• Enlist the features of diabetesinsipidus<br>• Explain the pathophysiology and treatment of central diabetesinsipidus<br>• Discuss the pathophysiologyof nephrogenic diabetes insipidus |
| | Osmoreceptor ADH Feedback System | • Make the flow chart to show the Osmoreceptorantidiuretic hormone (ADH) feedback mechanism for regulating extracellular fluid osmolarity in response to a waterdeficit.<br>• Enlist the factors which increaseand decrease the release of ADH |
| | Thirst | • Explain the mechanism ofthirst |
| | Renal regulation of potassium | • Enumerate the factors that can alter potassium distribution between intracellular and extracellularfluids<br>• Discuss the process of secretion of potassium by renal tubules Explain the regulation of internalpotassium distribution and potassium secretion |

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| | Control of ECF osmolarity | • Explain the control of extracellular fluid osmolarity and sodiumconcentration |
| | Control of ECF | • Explain the integration of renal mechanism for control of Extracellular Fluid(ECF)<br>• Explain the importance ofpressure natriuresis and diuresis in maintaining body sodium and fluid balance |
| | Renal regulation of calcium | • Explain the renal handling of calcium concentration to regulate plasma calcium concentration<br>• Renal regulation ofphosphate<br>• Enumerate the factors that alter renal calcium<br>• Enlist the factors that alter renalphosphate excretion |
| | Renal body fluid feedback control | • Explain the nervous and hormonal factors that increase the effectiveness of renal body fluid feedbackcontrol |
| | ECF and Blood Volume | • Explain the conditions that cause large increase in blood volume and ECFvolume<br>• Explain the conditions that cause large increase ECF volume but withnormal blood volume |
| | Acid base balance | • Explain the renal handling of H+ion. |
| | Acid base disturbance | • Analyze the acid base disturbances on the basis of pH, HCO3 and CO2<br>• Explain the causes and compensation of metabolicacidosis<br>• Explain the causes and compensation of metabolicalkalosis<br>• Explain the causes and compensation of respiratoryacidosis<br>• Explain the causes and compensation of respiratoryalkalosis<br>• Explain the causes and compensationof mixed acid base disorder |

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| | Anion gap | • Define and explain aniongap |

## Medical Biochemistry

| Topic | Sub Topic | Learning objectives |
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| **Medical Biochemistry** | Protein digestion and absorption, reabsorption, and related disorders | • Describe digestion and absorption of dietary proteins along with the inherited and acquired disorders (peptic ulcer, Hartnup disease, gluten enteropathy and cysticfibrosis).<br>• Elaborate the mechanisms involved in renal reabsorption of amino acids and discuss related disorders (Hartnup disease and cystinuria) |
| | Protein Metabolism/ Protein degradation and turnover | • Clearly differentiate betweenprotein digestion and Proteindegradation.<br>• Compare the salient feature of the two major mechanisms for degradation of bodyproteins.<br>• Elaborate the concept of protein turnoverand quote examples of short lived and long-lived proteins. |
| | Protein Metabolism/ Amino acid pool and nitrogen balance | • Define amino acidpool.<br>• Delineate the sources and fates of amino acids.<br>• Define nitrogen balance and its threestates.<br>• Give physiological and/or pathological conditions associated with each state of nitrogenbalance. |
| | Protein Metabolism/ Introduction to Reactions involved in catabolism | • Enlist 7 important reactions involved in amino acid metabolism and give a brief introduction of each. (Deamination,Transamination, Trans-deamination, Deamidation, Decarboxylation, Transmethylation&Transpeptidation) |

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| | Protein Metabolism/ Transamination | • Define transamination. Describe the reactions catalyzed by ALT (alanine transaminase) and AST (aspartate aminotransferase) with special reference to the role of pyridoxal phosphate in the transfer of aminogroup.<br>• Give diagnostic and prognostic importance of serum ALT andAST.<br>• Elaborate the importance oftransamination reaction in amino acid metabolism |
| | Protein Metabolism/ Trans deamination | • Define oxidative deamination. Describe the reaction catalyzed by glutamate dehydrogenase (GDH) along with its significance.<br>• Define transdeamination |
| | Protein Metabolism/ Deamidation | • Define deamidation. Describe deamidation reaction catalyzed by glutaminase and asparaginase along with theirsignificance.<br>• Explain how does L-asparaginase help in the management of certain types ofleukemia.<br>• Elaborate the mechanism for shunting of glutamine from liver to kidneys during acidosis. Give advantage ofshunting. |
| | Protein Metabolism/ Decarboxylation | • Define decarboxylation. Describeimportant decarboxylation reactions along with their significance |
| | Protein Metabolism/ Sources and transport of ammonia | • Give sources of ammonia in humanbody.<br>• Describe how ammonia is transported to liver with special reference to the role ofglutamine and alanine in this transport mechanism |
| | Protein Metabolism/ Urea cycle, ammonia intoxication and its management | • Elaborate the reactions and regulation of urea cycle.<br>• Enlist the inherited and acquired causes of hyperammonemia in each condition. Give the biochemical mechanisms underlying ammoniaintoxication.<br>• Discuss dietary and therapeutic measures for the management of patients with hyperammonemia (phenylbutyrate,lactulose, antibiotics |

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| | Protein Metabolism/ Biosynthesis of NEAA | • Trace the pathways for synthesis of non-essential amino acids (NEAA) (alanine, aspartate, glutamate glutamine, asparagine, proline, serine, glycine, cysteine, andtyrosine |
| | Protein Metabolism/ Degradation of carbon skeleton of amino acids | • Discuss the fate of carbon skeletons of amino acids.<br>• Categorize amino acids intoglucogenic, ketogenic or both depending upon the intermediates produced during their catabolism.<br>• Outline the catabolic pathways of amino acids that yieldoxaloacetate.<br>• Outline the catabolic pathways of aminoacids that yield α-ketoglutarate.<br>• Outline the catabolic pathways of amino acids that yieldpyruvate.<br>• Outline the catabolic pathways of amino acids that yieldfumarate.<br>• Outline the catabolic pathways of amino acids that yield succinylCoA.<br>• Outline the catabolic pathways of aminoacids that yield acetyl CoA or acetoacetyl CoA. |
| | Protein Metabolism/ Inborn errors of amino acid metabolism | • Describe the metabolism of methionine. Discuss cause, Key diagnostics features and management of homocystinuria.<br>• Describe the catabolism of branched chain amino acids.<br>• Discuss cause, key diagnostic features, and management of Maple Syrup Urine disease<br>• Describe the metabolism of tyrosine.<br>• Discuss the cause, key diagnostic features, and management of alkaptonuria, albinism, and type 1tyrosinemia.<br>• Give cause, key diagnostic features, and management of phenylketonuria(PKU)<br>• Elaborate special roles of glycine, tryptophan, Phenylalanine, tyrosine, and methionine. |

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| | Water, pH, Buffers/ Ionization of water | • Describe ionization of water and elaborate its Significance. Discuss water and electrolyte balance in health and disease |
| | Water, pH, Buffers/ pH and pH scale | • Define pH and describe the concept of pH scale. |
| | Water, pH, Buffers/ weak acids and their significance | • Define weak acids and conjugate base. |
| | Water, pH, Buffers/ Ka And pKa | • Define Ka and pKa and give their significance |
| | Water, pH, Buffers/ HH equation and its applications | • Describe Henderson-Hassel bach (HH) equation. (No derivation required) along with its application/use. |
| | Water, pH, Buffers/ HH equation and its applications | • Define buffers.<br>• Enumerate the component of a buffers system and describe their mechanism of action.<br>• Enlist important buffers present in blood, plasma, ECF (Extra Cellular Fluid), ICF (Intra Cellular Fluid) and renal tubular fluid.<br>• Elaborate the working of bicarbonate buffer and phosphate buffer |
| | Acid Base balance and imbalance/ Renal mechanisms for pH regulation | • Elaborate the role of kidneys in the regulation of acid base balance. |
| | Acid Base balance and imbalance/ Defense mechanisms against changes in H+ concentration | • Elaborate the concept of 1st, 2nd and 3rd line of defense against changes in H+ ion concentration. |
| | Acid Base balance imbalance/ Types of acid base disorders | • Define acidosis andalkalosis.<br>• Classify acid basedisorders.<br>• Enlist causes of metabolic acidosis and give its compensation. Enlist causes of respiratory acidosis and give its compensation.<br>• Enlist causes of metabolic alkalosis andgive |

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| | | its compensation. |

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| | | • Enlist causes of respiratory alkalosis andgive its compensation. |
| | Acid Base balance imbalance/ Tetany in alkalosis | • Interpret disorders metabolic and respiratory disorders of acid base balance on basis of sign, symptoms and arterial blood gas (ABG) findings<br>• Give biochemical explanation fortetany associated with alkalosis |

## Pathophysiology and Pharmacotherapeutics

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Pharmacology & Therapeutics** | Diuretics | • Classify diuretics & carbonicanhydrase inhibitor. MOA, clinical uses, and adverseeffects<br>• Describe Thiazide & loop diuretics their Mechanism of Action, clinical uses, and adverseeffects.<br>• Describe Potassium sparing andosmotic diuretics their mechanism of action, clinical uses, and adverse effects. |
| **Pathology** | Renal Stones | • Discuss the etiology and pathogenesis of different types ofstones |
| | Hydronephrosis | • Identify the causes, morphologicalaspect & outcome ofhydronephrosis |
| | UTI causative agents | • Enlist common causative agents of urinary tract infections and describe pathogenesis and clinical featuresof common causative agents of UTI. |
| | Glomerulonephritis | • Define various presentations of glomerulonephritis.<br>• Define nephrotic and nephritic syndrome.<br>• List various risk factors andoutline managementof glomerulonephritis. |

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| | Acute Kidney Injury | • Define AKI (acute kidneyinjury) Identify various risk factors and causes for AKI. Outline management strategies. |
| | Urinary tract infection | • Define UTI (Urinary TractInfection)<br>• Identify various risk factors and causes ofUTI.<br>• Describe signs and symptoms ofUTI.<br>• Outline managementstrategies. |

## Aging

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Aging** | Disease prevention | • To define preventive care in diseases related to urinary system(adults).<br>• Primary, secondary, and tertiaryprevention. |
| | Urinary incontinence | • Define urinaryincontinence.<br>• Outline managementstrategies. |

## Disease Prevention &impact

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Community Medicine and Public Health** | Quality of life | • Discuss the significance of quality of life in disease and treatmentsettings.<br>• Measures of health status.Disability-Adjusted Life Year (DALY) and Quality-Adjusted Life Year (QALY) Life expectancy |
| **Behavioral Sciences** | Dementia, uremic encephalopathy, delusion, muscle paralysis & Societal impact | • To identify the behavioral abnormalities caused by renalfunction.<br>• To identify the cognitiveabnormality.<br>• To identify the dangers for the patient,his family, andsociety. |

## 5.2.2. Skills

**Practical's**

| Topic | Sub Topic | Learning objectives |
|---|---|---|
| **Histology** | Kidney | • Identify and draw and label thehistological structure of kidney and enumerate points of identification |
| | Ureter | • Identify, draw and label the histological structure of ureter and enumerate its pointsof identification |
| | Urinary bladder | • Identify, draw and label the histological structure of urinary bladder and enumerateits points of identification |
| **Biochemistry** | Interpretation of results | • Estimate blood urea level and interpret your results.<br>• Estimate serum creatinine level and interpret your results.<br>• Compare the usefulness of blood urea and serum creatinine in assessment of renal functions.<br>• Determination of proteins in urine bydipstick method and interpret yourresults.<br>• Estimate serum acid phosphatase level and interpret yourresults. |
| **Physiology** | Interpretation of report | • Perform a complete examination of the urine sample URS-10 (using urine reagent-10) and interpret itsreport<br>• Determine the specific gravity ofurine |

## 5.2.3. C-FRC for Renal-1 Module

| RENAL MODULE | | |
|---|---|---|
| **Objectives** | **Skill** | **Miller's Pyramid Level Reflected** |
| Detail the steps of urinary catheterization in females | *Catheterization | Knows how |
| Detail the steps of urinary catheterization in males | *Catheterization | Knows how |

# 5. Attitude

## PERL's for Block-IV

| Code | Domain | Attribute | Specific Learning Outcome | Topic | Portfolio Entry |
|---|---|---|---|---|---|
| PERLs-2-01 | Professionalism | Responsible & Accountable | Develop a dress code for your class | Importance of codes, rules, and regulations in civilized societies<br>Dress codes followed by international medical societies and institutions | Dress Code |
| PERLs-2-02 | | | Demonstrate punctuality in attending classes | Importance of time | Attendance record |
| PERLs-2-03 | | Self-Aware | Demonstrate improvement in one area of weakness identified in the previous year | Setting and tracking milestones in strategic planning | Letter or certificate of accomplishment of a self-reflection |
| PERLs-2-04 | | Team Player | Develop a code of conduct for students in the small group discussions in teams | Group discussion Techniques of focus group discussion<br>Democratic vs consensus-based decision making | Code of Conduct |
| PERLs-2-05 | Ethics | Digital Citizen | Upgrade the portfolio with at least two academic and personal achievements in last one year | e-Portfolio<br>Personal websites | Updated entries |
| PERLs-2-06 | | | Write a blog or a wiki | Different form of digital content<br>Engagement strategies with digital content<br>Structure of a wiki and blogpost | Published wiki or blog |
| PERLs-2-07 | Research | Evidence Based Practitioner | Identify a topic for literature review | What is research<br>What is the scientific method<br>Developing a Literature search strategy | Research topic finalization process record |
| PERLs-2-08 | Leadership | Resilient & Adaptable | Write a report on different coping mechanisms used by you during year 1 | Comparison between coping strategies<br>Choosing the right coping strategy for academic and personal issues<br>Report writing | Report |

# ASSESSMENT POLCIY AND TOS OF UHS

# 7. Teaching & Learning Methodologies

**InteractiveLectures**

Interactive lecturing involves an increased interchange between teachers, students and the lecture content. The use of interactive lectures can promote active learning, heighten attention and motivation, give feedback to the teacher and the student, and increase satisfaction for both.

**Small groupdiscussions**

Small-group discussion is a student-centered methodology that allows students to actively involve and be partners in the teaching-learning process. Students interact with peers and instructors, discussing, and sharing ideas. They develop the ability to build consensus in a group.

**Practical's**

Hands-on performance of skills in laboratory

**Clinical SkillsSession**

Clinical skills are abilities health care professionals use when assessing, diagnosing and caring for patients. Clinical skills also describe applied medical knowledge, such as assessingbloodwork.

**Case basedLearning**

Case-based learning is a student-centered learning approach where students read and discuss complex situations and apply their knowledge to each situation. Students typically examine the case together as a team and address the problems within the realistic scenario to develop a reasonableconclusion.

**Problem BasedLearning**

Problem-based learning (PBL) is a student-centered approach in which students learn about a subject by working in groups to solve an open-ended problem. This problem is what drives the motivation and the learning.

**Self-directedlearning**

Self-directed learning is an instructional strategy where the students with guidance from the teacher decide what and how they will learn. It can be done individually or with group, learning, but the overall concept is that students take honor ship of theirlearning

# 8. AssessmentMethodologies

## 1. Theory

### MCQ's

A multiple-choice question (MCQ) is composed of two parts: a stem that identifies the question or problem, and a set of alternatives or possible answers that contain a key that is the best answer to the question, and a number of distractors that are plausible but incorrect answers to the question.

### SEQ's

It is a type of assessment tool in which a question on a topic is given in test or examination requiring a written analysis and explanation usually of a specified length.

## 2. Practical

### OSPE

"Objectively Structured Practical Examination.", as a tool for the assessment of practical skills of undergraduate Medical Students.

### OSCE

OSCE stands for "Objectively Structured Clinical Examination." OSCEs are very helpful in medical education because they allow a student to practice and demonstrate clinical skills in a standardized medical scenario.

## 3. OSVE

OSVE stands for "Objectively Structured Viva Examination". In the viva you have to answer questions and engage with your examiners.

# 9. Assessment Policy(UHS)

## Statutes

1. The first professional MBBS shall be held at the end of first year MBBS whereas, the second Professional MBBS Examination shall be held at the end of the secondyear.
2. Every candidate shall be required to study contents of Anatomy (including Histology), Physiology, Biochemistry, Behavioral Sciences, Community Medicine & Public Health, Pathology, Pharmacology & Therapeutics, Islamic Studies/Ethics and Pakistan Studies, Clinical skills and Professionalism, Ethics, Research and Leadership. The teaching and assessment shall be done in three modularblocks.
3. There will be three papers in the first professional examination, and four papers in the second professionalexamination

   **First Professional Exam:**

   a) Paper 1 will be based on contents of Block1;
   b) Paper 2 will be based on contents of Block2;
   c) Paper 3 will be based on contents of Block3;

   **Second Professional Exam:**

   a) Paper 1 will be based on contents of Block4;
   b) Paper 2 will be based on contents of Block5;
   c) Paper 3 will be based on contents of Block6;
   d) Paper 4 will be based on contents of Islamic Studies/Civics and PakistanStudies;

4. Each paper will comprise of two components 'Written' and'Oral/Practical/Clinical' examinations.
5. The 'Written' and 'Oral/Practical/Clinical' examinations in each paper will carry 150 marks each, making the total marks of 300 for each paper of papers 1, 2 and 3 (inclusive of internalAssessment).
6. Total marks for the First and Second Professional Examination shall be 900, each. Marks of Islamic Studies/Civics and Pakistan Studies shall not be counted towards total marks of any professional examination and determination of positions or merit of the candidate. However, the candidates shall have to take the examination in the subject in their Second Professional MBBS Examination. Those failing the subject in both annual & supplementary examinations, while passing all the other subjects of Second Professional Examination shall be promoted to the 3rd year MBBS, however they will be allowed two more attempts to clear the subject with professional Examination of the next session, failing which they shall be detained in the 3rd ProfessionalMBBS.
7. Major content areas of the first two professional years shall befrom:
   a. Anatomy includingapplied/clinical/Anatomy
   b. Physiology includingapplied/clinical/Physiology
   c. Biochemistry including applied/clinical/Biochemistry
8. The Applied/Clinical content for the Anatomy, Physiology and Biochemistry shall be based on clinicalcorrelations.

9. Integrated clinical content areas for the both years include Behavioral Sciences, Community Medicine & Public Health, Pathology, Pharmacology & Therapeutics, Clinical Foundation- 1& II and PERLs- 1 &II.

**10. WrittenExamination**

d. The written component of Papers 1, 2, and 3 will consist of 'One-best-type' Multiple Choice Questions (MCQ) and Structured Essay Questions (SEQ) in a ratio of 70:30%.
e. Each MCQ will have five options (one best response and four distractors) and will carry one (01)mark.
f. There will be no negativemarking.
g. There will be no sections within an SEQ, and it will be a structures question with five (05) markseach.
h. SEQ's will only be based on the major content areas of theyear.
i. There will be total of 85 MCQs and 07 SEQs in every written paper in Papers 1, 2 and 3.
j. The duration of each written paper will be 180 minutes (03hours).
k. The MCQ section will be 110 minutes duration and the SEQ section 70minutes.

**11. Oral/Practical/ClinicalExamination**

a. The Oral/Practical/Clinical examination of each Papers 1, 2, and 3 will consist of a total of twelve (12) OSPE/OSCE/OSVE stations in each Oral/Practical/Clinical examination.
b. There will be seven (07) Observed OSPE (Objective Structured Practical Examination) stations from major subject areas. Each OSPE station will have the Practical component and an evaluation of the underlying principle relevant to that practical with a component of appliedknowledge.
c. There will be two (02) Observed OSCE (Objective Structured Clinical Examination) stations, 01 from C-FRC1 and PERLs-1 in each Oral/Practical/Clinicalexamination.
d. There will be three (03) Observed Interactive OSVE (Objective structured Viva Examination) from major subject areas. Each OSVE station will have a structured Viva to assess a practical component along evaluation of the underlying principle relevant to that practical with a component of applied/practical knowledge and related clinicalapplication.
e. Each OSPE/OSCE will carry eight (08)marks.
f. Each OSVE station will carry 16marks
g. The duration of each Oral/Practical/Clinical examination will be 120 minutes (2 hours).
h. Time for each OSPE, OSCE and OSVE station will be eight (08)minutes.

12. Every candidate shall take the examination in the following Blocks (Modules) in First & Second Professional MBBSExamination:

**Year 1**

i. Block 1 (Foundation-I + Hematopoietic &Lymphatic) Marks 300
ii. Block 2 (Musculoskeletal &Locomotion-1) Marks 300
iii. Block 3 (Cardiovascular-lRespiratory-1)Marks 300

**Year 2**

a. Block 4 (Gastrointestinal Tract & Nutrition- Renal-1) Marks 300
b. Block 5 (Endocrinology & Reproduction Head & Neck, Special Senses) Marks 300
c. Block 6 (Neurosciences-1+ Inflammation) Marks 300
d. Islamic Studies Civics Pakistan Studies Marks 100

**A. Block 1 (Foundation- Hematopoietic andLymphatic)**

The examination in Block 1 shall be as follows:

I. One written paper of 120 marks having twoparts
   a. Part I shall have eighty-five Multiple Choice Questions (MCQs) of total 85 marks (01 mark for each MCQ) and the time allotted shall be 110 minutes. There will be no negativemarking.
   b. Part II shall have seven Structured Essay Questions (SEQs) of total 35 marks (05 marks for each SEQ) and the time allotted shall be 70minutes.
II. Oral Practical/Clinical examination shall have 120 marks intotal.
III. The continuous internal assessment through Block Examination conducted by the collegeofenrollmentshallcarry60marks,e20%ofthetotalallocatedmarks (300) for the block The score will be equality distributed to the Written and Oral/Practical Clinical Examinations

**B. Block 2 (Musculoskeletal &Locomotion-1)**

i. One written paper of 120 marks having twoparts
   a. Part I shall have eighty-five Multiple Choice Questions (MCQs) of total 85 marks (01 mark for each MCQ) and the time allotted shall be 110 minutes. There will be no negativemarking.
   b. Part II shall have seven Structured Essay Questions (SEQs) of total 35 marks (05 marks for each SEQ) and the time allotted shall be 70minutes
ii. Oral Practical/Clinical examination shall have 120 marks intotal.

iii. The continuous internal assessment through Block Examination conducted by the collegeofenrollmentshallcarry60marks,e20%ofthetotalallocatedmarks (300) for the block The score will be equality distributed to the Written and Oral/Practical Clinical Examinations

**C. Block 3 (Cardiovascular-l +Respiratory-1)**

I. One written paper of 120 marks having twoparts

a. Part I shall have eighty-five Multiple Choice Questions (MCQs) of total 85 marks (01 mark for each MCQ) and the time allotted shall be 110 minutes. There will be no negativemarking.

b. Part II shall have seven Structured Essay Questions (SEQs) of total 35 marks (05 marks for each SEQ) and the time allotted shall be 70minutes.

II. Oral Practical/Clinical examination shall have 120 marks intotal.

III. The continuous internal assessment through Block Examination conducted by the collegeofenrollmentshallcarry60marks,e20%ofthetotalallocatedmarks (300) for the block the score will be equality distributed to the Written and Oral/Practical Clinical Examinations.

**D. Block 4 (Gastrointestinal & Nutrition-1 +Renal-1)**

The examination in Block 4 shall be as follows

I. One written paper of 120 marks having twoparts

a. Part I shall have eighty-five Multiple Choice Questions (MCQs) of total85 marks (01 mark for each MCQ) and the time allotted shall be 110 minutes. There will be no negativemarking.

b. Part II shall have seven Structured Essay Questions (SEQs) of total 35marks (05 marks for each SEQ) and the time allotted shall be 70minutes.

II. Oral Practical/Clinical examination shall have 120 marks intotal.

III. The continuous internal assessment through Block Examination conducted by the college of enrollment shall carry 60 marks, e 20% of the total allocated marks (300) for the block the score will be equality distributed to the Written and Oral/Practical ClinicalExaminations.

**E. Block 5 (Endocrinology & Reproduction-1 + Head & Neck, SpecialSenses)**

The examination in Block 5 shall be as follows

I. One written paper of 120 marks having twoparts
   a. Part I shall have eighty-five Multiple Choice Questions (MCQs) of total 85 marks (01 mark for each MCQ) and the time allotted shall be 110 minutes. There will be no negativemarking.
   b. Part II shall have seven Structured Essay Questions (SEQs) of total 35 marks(05 marks for each SEQ) and the time allotted shall be 70minutes.

II. Oral Practical/Clinical examination shall have 120 marks intotal.

III. The continuous internal assessment through Block Examination conducted by the college of enrollment shall carry 60 marks, e 20% of the total allocated marks (300) for the block the score will be equality distributed to the Written and Oral/Practical Clinical Examinations.

**F. Block 6 (Neurosciences-1 +Inflammation)**

The examination in Block 6 shall be as follows

I. One written paper of 120 marks having twoparts
   a. Part I shall have eighty-five Multiple Choice Questions (MCQs) of total 85marks (01 mark for each MCQ) and the time allotted shall be 110 minutes. There will be no negativemarking.
   b. Part II shall have seven Structured Essay Questions (SEQs) of total 35 marks(05 marks for each SEQ) and the time allotted shall be 70minutes.

II. Oral Practical/Clinical examination shall have 120 marks intotal.

III. The continuous internal assessment through Block Examination conducted by the college of enrollment shall carry 60 marks, e 20% of the total allocated marks (300) for the block the score will be equality distributed to the Written and Oral/Practical Clinical Examinations.

**G. Islamic Studies/Civics and PakistanStudies**

The examination in Islamic Studies/Civics and Pakistan Studies shall be as follows:

I. One written paper of 100 marks in Islamic Studies/Civics and Pakistan Studieshaving two components:

a. Islamic Studies/Civics component having total 60 marks. There will be three (3) Long Essay Questions (LEQs) to be attempted out of Five (5), having 20 marks each.

| YEAR-2 | | | | | | |
|---|---|---|---|---|---|---|
| **Block 4**<br>**Modules**<br>(GIT & Nutrition-I + Renal-I) | Part I MCQs (85) | 85 Marks | Practical / Clinical Examination | 07 OSPE<br>02 OSCE<br>03 OSVE | Marks<br>56<br>16<br>48 | **300** |
| | Part II SEQS (7) | 35 Marks | | | | |
| | Internal Assessment 10% | 30 Marks | Internal Assessment 10% | 30 Marks | | |
| | Total | **150** | Total | **150** | | |
| **Block 5**<br>**Modules**<br>(Endocrinology & Reproduction-I + Head& Neck, Special Senses) | Part I MCQs (85) | 85 Marks | Practical / Clinical Examination | 07 OSPE<br>02 OSCE<br>03 OSVE | Marks<br>56<br>16<br>48 | **300** |
| | Part II SEQS (7) | 35 Marks | | | | |
| | Internal Assessment 10% | 30 Marks | Internal Assessment 10% | 30 Marks | | |
| | Total | **150** | Total | **150** | | |
| **Block 6**<br>**Modules**<br>(Neurosciences-I + Inflammation) | Part I MCQsPart II SEQS | 85 Marks<br>35 Marks | Practical / Clinical Examination | 120 Marks | | **300** |
| | Internal Assessment | 30 Marks | Internal Assessment | 30 Marks | | |
| | Total | **150** | Total | **150** | | |
| | **Total Marks** | | | | | **900** |
| **Islamic Studies/ Civics and PakistanStudies** | **Islamic Studies/Civics**<br>3 LEQs of 20 marks each | | | 60 Marks | | **100*** |
| | **Pakistan Studies**<br>2 LEQs of 20 marks each | | | 40 Marks | | |
| | Total | | | **100** | | |

b. Pakistan Studies component having total 40 marks. There will be two (2) Long Essay Questions (LEQs) to be attempted out of Four (4), having 20 markseach.

- Total marks for the First and Second Professional Examination shall be 900, each. Marks of Islamic Studies/Civics and Pakistan Studies shall not be counted towards total marks of any professional examination, and determination of position or merit of a candidate. However, the candidate shall have to take the examination in the subject in their Second Professional MBBS Examination. Those failing the subjects in both annual & supplementaryexamination,whilepassingalltheothersubjectsofSecondProfessional

Examination shall be promoted to the 3rd year MBBS, however they will be allowed two more attempts to clear the subject with Second Professional Examination of the next session, failing which they shall be detained in the 3rd Professional MBBS.

13. **No grace marks shall be allowed in any examination or practical under any guise or name.**
14. At least 25% MCQ & 25% SEQ shall be based on applied/case/clinical scenarios to assess high order thinking in the papers set for the students of First and Second Professional MBBSExamination.

# 11. Exam Regulations byUHS

1. Professional examination shall be open to any studentwho:
    a. Has been enrolled/registered and completed one academic year preceding the concerned professional examination in a constituent/affiliated College of the University.
    b. Has his/her name submitted to the Controller of Examinations, for the purpose of examination, by the Principal of the college in which he/she is enrolled & is eligible as per all pre-requisites of theexamination
    c. Has his/her marks of internal assessment in all the Blocks sent to the Controller Examinations by the Principal of the college along with the admissionforms.
    d. Produces the following certificates duly verified by the Principal of his/ her College:
        I. Of goodcharacter;
        II. Of having attended not less than (85%) of the full course of lectures delivered and practical conducted in the particular academic session in each Block, as well as inaggregate.
        III. Certificate of having appeared at the Block Examinations conducted by the college of enrolment with at least 50% cumulative percentage in aggregate of blocks 1, 2 and 3 for the first year and blocks 4, 5 and 6 for the secondyear.
        IV. Candidates falling short of lectures or practical shall not be admitted to the examination but may be permitted to appear at the supplementary examination if they make up the deficiency up to the commencement of the next examination by remaining on the rolls of a college as regular student, subject to fulfillment of all other mandatory requirements to appear at theexamination.
2. The minimum number of marks required to pass this examination for each paper shall be fifty percent (50%) in Written and fifty percent (50%) in the Oral/Practical/Clinical examinations and fifty percent (50%) in aggregate, independently and concomitantly at one and the sametime.
3. Candidates who secure eighty five percent (85%) or above marks in any of the papers shall be declared to have passed **"with distinction"** in that Block subject to having at least 80 % marks in the Written component of that paper, concomitantly. However, no candidate shall be declared to have passed "with distinction" in any paper, who does not pass in all the papers of the First Professional Examination as a whole at one and the sametime.
4. A candidate failing in one or more paper of the annual examination shall be provisionally allowed to join second professional class till the commencement of supplementary examinations. Under no circumstances, a candidate shall be promoted to the second professional class till he/she has previously passed all the papers in the First Professional MBBSExamination.

5. If a student appears in the supplementary examination for the first time as he/she did not appear in the annual examination because of any reason and fails in any paper in the Supplementary Examination, he/she will be detained in the same class and will not be promoted to the nextclass.
6. Any student who fails to clear First Professional Examination in four consecutive attempts, inclusive of both availed as well as un-availed, after becoming eligible for the examination, and has been expelled on that account shall not be eligible for continuation of studies and shall not be eligible for fresh admission as a fresh candidate in either MBBS or BDS. (Ref. UHS Circulars/137-20/2750 dated23-11-2020).
7. The colleges may arrange remedial classes and one re-sit for black examination either with the subsequent block examination or before completion of the block, and before or during preparatory leave in case of the terminal block of the professional year, before issuance of the date sheet for the concerned professional examination, subject to the followingcondition:
    I. At the completion of each block, the principals of the colleges shall submit a detailed report to the university, including cases of students with short attendance poor performance/absence in the block examination along with the reasons and evidence for the same, proposed schedule to remedial classes and re-sit examination.
    II. Competent Authority UHS will have the cause and the submitted evidence evaluated and documented, before permitting the colleges to arrange remedial classes and re-sit examination at the concerned block. No college is allowed to conduct remedial classes or re-sit examination without prior approval of the competent authority
    III. The students can appear in re-sit of a block examination, along with the subsequent block, and before or during preparatory leave for the terminal black of the professional year, once the requirement of attendance is met with However conduct of remedial classes shall be permitted only in the cases of students, who shall have attended at least 50% of total attendance of the concerned block in the firstinstance
    IV. The valid reasons for short attendance in a block or absence from a block examination may include major illness/accident/surgery of the student or death of an immediate relative/being afflicted by a natural calamity ordisaster
8. The application for admission of each candidate for examination shall be submitted to the Controller of Examination, through the Principal of the College, in a prescribed format, as per notified schedule, accompanied by the prescribedfee.
9. The marks of internal assessment and attendance shall be submitted to Controller of Examinations three times, within two weeks of completion of each blockexamination
10. At the end of each block, the colleges are required to submit question papers and keys for the block examination, internal assessment marks and attendance record to the Department of Examinations UHS. Further, parent-teacher meetings shall be arranged by thecollegesaftereveryblockexaminationtosharefeedbackontheprogressofstudents

with their parents, Minutes of parent teacher meetings shall be submitted to the Department of Medical Education UHS.

11. ll is emphasized that fresh internal assessment or a revision of assessment for supplementary examination shall not be permissible. However, a revised internal assessment for the detained students can be submitted. The internal assessment award in a particular year will not be decreased subsequently detrimental to the detainee candidate. A proper record of the continuous internal assessment shall be maintained by the concerned departments in thecolleges.
12. The candidates shall pay their fee through the Principals of their respective colleges who shall forward a bank draft / pay order / crossed cheque in favor of Treasure, university of Health Sciences Lahore, along with their Admission Forms.
13. Only one annual and one supplementary of First and Second Professional MBBS Examinations shall be allowed in a particular academic session. In exceptional situations i.e., national calamities, war or loss of solved answer books in case of accident, special examination may be arranged after having observed due process of law. This will require permission of relevant authorities, i.e., Syndicate and Board ofGovernors.

# 12. Examination RulesDGKMC

- Students must report to examination hall/ venue at least 30 minutes before theexam.
- Exam will start sharp attime.
- Late comers arriving at the examination hall more than 15 minutes after the start of the paper will not be allowed to enter the examinationhall.
- All students should wear Lab coats before appearing in theexam.
- Students are not allowed to take into the examination hall textbooks, notes or manuscript of anykind.
- Students must bring the necessary stationary items for exam with them e.g. pen/pencil/eraser/ball point/sharpener etc.
- Mobile phones and gadgets are strictly prohibited in examination hall. If any student found with Mobile Phone (Silent/Switched off/on) he/she will not be allowed to continue theexam.

## 13. Table of Specification(TOS)

**MBBS 2nd Professional**

**Block-4**

| Theme | Subject | Written Exam | | | Oral/Practical/Clinical Exam | | | |
|---|---|---|---|---|---|---|---|---|
| | | MCQ (1 mark) | SEQ (5 mark each) | Marks | OSPE (8 marks each observed) | OSCE (8 marks each observed) | OSVE (16 marks each observed) | Marks |
| Normal Structure | Anatomy applied/clinical | 23 | 03 | 38 | 03 | - | 01 | 40 |
| Normal Function | Physiology applied/clinical | 16 | 02 | 26 | 02 | - | 01 | 32 |
| | Biochemistry applied/clinical | 20 | 02 | 30 | 02 | - | 01 | 32 |
| Disease Burden & Prevention | Community Medicine & Public Health | 07 | - | 07 | - | - | - | - |
| | Behavioral Sciences | 06 | - | 06 | - | - | - | - |
| Pathophysiology & pharmacotherapeutics | Pathology | 09 | - | 09 | - | - | - | - |
| | Pharmacology | 04 | - | 04 | - | - | - | - |
| CFRC | CF-2-1 | - | - | - | - | 01 | - | 08 |
| PERLs | PERLs-2-1 | - | - | - | - | 01 | - | 08 |
| **Total** | | **85** | **7x5=35** | **120** | **07 stations x 08 = 56** | **02 stations x 08 = 16** | **03 stations x 16=48** | **120** |

# 14. Frame work of Block-4 Module Timetable2024

**DEPARTMENT OF MEDICAL EDUCATION**

**D. G. KHAN MEDICAL COLLEGE DERA GHAZI KHAN**

TIME TABLE FOR 2nd YEAR MBBS (BLOCK-4)

w.e.f. (04-03-2024 TO 25-05-2024) --- 10 weeks

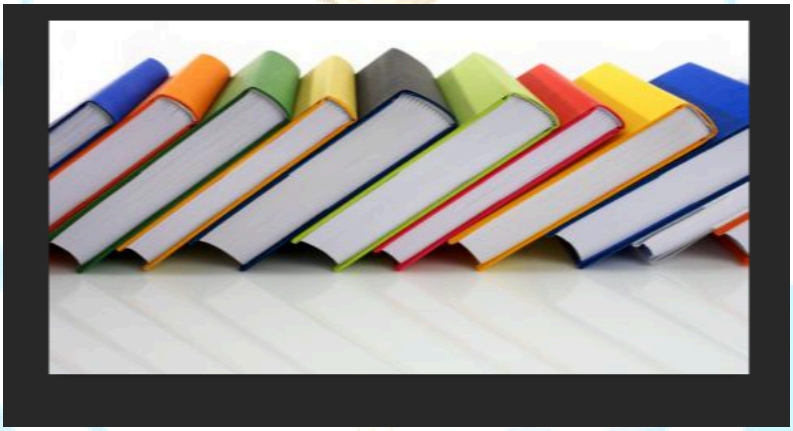
| Day | 08:00 AM to 09:30 AM | 09:30 AM to 10:00 AM | 10:00 AM to 10:50 AM | 10:50 AM to 11:40 AM | 11:40 AM to 01:10 PM | | 1:10 PM to 02:00 PM |
|---|---|---|---|---|---|---|---|
| Monday | Anatomy practical (A)<br>Physiology practical (B)<br>Biochemistry practial (C) | Break | Biochemistry | Physiology | Gross Anatomy | | PERLs |
| Tuesday | Anatomy practical (B)<br>Physiology practical (C)<br>Biochemistry practial (A) | | Biochemistry | Physiology | Gross Anatomy | | Behavioral Sciences/ Community Medicine |
| Wednesday | Anatomy practical (C)<br>Physiology practical (A)<br>Biochemistry practial (B) | | Anatomy (INTEGRATION) | Physiology | Gross Anatomy | | Biochemistry |
| Thursday | SGD<br>Anatomy | | Anatomy | Physiology | 11.40-12.25pm<br>Physiology (Integration) | 12.25-1.10pm<br>PATHOLOGY (INTEGRATION | SDL<br>Physiology |
| Friday | SGD<br>Physiology | | Anatomy | ISL/PAK. STD | 11.00 to.12.00<br>Biochemistry Integration | | |
| Saturday | SGD<br>Biochemistry | | Biochemistry | Physiology | Pharmacology / Pathology | 12.20-2.00pm<br>CSIM | |

**Block 4 Exam: 29th May-1st June**

**DIRECTOR**

Medical Education Department
D.G.Khan Medical College
Dera Ghazi Khan

# RESOURCE BOOKS



# 10. LearningResources

| | |
|---|---|
| Anatomy | • Snell's Clinical Anatomy 10thed.<br>• Langman's Medical Embryology 12thed<br>• Medical Histology by Laiq Hussain Siddiqui 8thed.<br>• General Anatomy by Laiq Hussain Siddiqui 6thed. |
| Physiology | • Guyton AC and Hall JE. Textbook of MedicalPhysiology, W.B. Saunders & Co. Philadelphia<br>• Essentials of Medical Physiology by MushtaqAhmad |
| Biochemistry | • Harpers illustrated Biochemistry 32nd edition. Rodwell.V.WMCGrawHillpublishers.<br>• Lippincott illustrated Review 8th editionKluwer.W.<br>• Essentials of Medical Biochemistry vol 1&2 by Mushtaq Ahmed. |
| Community Medicine | • Parks TextBook of Preventive and Social Medicine, K. Park(Editor)<br>• Public Health and Community Medicine IlyasAnsari(Editors) |
| Pharmacology | • Basic and clinical Pharmacology by Katzung.McGraw-Hill<br>• Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins |
| Pathology | • Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WBSaunders.<br>• Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbinsand<br>• Cotran, Pocket Companion to Pathologic basis of diseases. SaunderHarcourt.<br>• Walter and Israel. GeneralPathology.<br>• ChurchillLivingstone. |
| Medicine | • Davidson's Principles and Practice ofMedicine |
| Surgery | • Bailey & Love Short Practice ofSurgery |
| Islamiyat | • Standard Islamiyat (compulsory) for B.A, B.Sc, MA, Msc, MBBS by Prof. M SharifIslahi<br>• IlmiIslamiyat (compulsory) mfor B.A, B.sc &equilent. |
| Behavioral Sciences | • Handbook of Behaioural Sciences by Prof. Mowadat H. Rana, 3rdEdition.<br>• Medical and Psychosocial Aspects of Chronic illness and Disability Sixth Edition Donna R. Falvo, PHD Beverley E. Holland, PHD RN. |