

STUDY GUIDE

Block - 5

Endocrinology & Reproduction - I
+
Head & Neck, Special Senses Module

2nd Year MBBS



Department of Medical Education
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Faisalabad

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1. List of Abbreviations

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
CO ₂	Carbon dioxide
COPD	Chronic obstructive pulmonary disease
COX	cyclooxygenase
CPR	Cardio pulmonary Resuscitation
CT	Computed tomography
CV	Cardiovascular

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

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 2k23 Framework

YEAR	MODULES
YEAR 1	<ul style="list-style-type: none"> • Foundation-1 • Hematopoietic & Lymphatic <p>Block 1</p>
	<ul style="list-style-type: none"> • Musculoskeletal & Locomotion-1 <p>Block 2</p>
	<ul style="list-style-type: none"> • Cardiovascular-1 • Respiratory-1 <p>Block 3</p>
	<ul style="list-style-type: none"> • PERLs 1 • Quran-1 • Islamiyat & Pak Studies <p>Will be taught throughout the year</p>
	<ul style="list-style-type: none"> • Clinical Skills Foundation <p>C-FRC 1 (Clinical – Foundation, Rotation, Clerkships)</p>
YEAR 2	<ul style="list-style-type: none"> • GIT & Nutrition • Renal • Endocrinology & Reproduction • Neurosciences • Head & Neck, Special Senses • Inflammation • PERLs - 2 • Quran-2 • Islamiyat & Pak Studies
	<ul style="list-style-type: none"> • Clinical Skills Foundation <p>C-FRC 2 (Clinical – Foundation, Rotation, Clerkships)</p>
YEAR 3	<ul style="list-style-type: none"> • Foundation-2 • Infectious Diseases • Neoplasia • Musculoskeletal & Locomotion-2 • Hematopoietic, Immunity & Transplant-2

	<ul style="list-style-type: none"> • Cardiovascular-2 • Respiratory-2 • Forensic medicine • Community Medicine & family Health-1 • PERLs - 3 • Quran-3
	<ul style="list-style-type: none"> • Clinical Rotations C-FRC 3 (Clinical – Foundation, Rotation, Clerkships)
YEAR 4	<ul style="list-style-type: none"> • Renal-2 • Endocrine & Reproduction-2 • GIT & Nutrition-2 • Neurosciences-2 • Maternal & Child Health • Ophthalmology • Otorhinolaryngology • Community Medicine & family Health-2 • Psychiatry & Behavioral Sciences • PERLs - 4 • Quran-4 • Electives • BLS workshop
	<ul style="list-style-type: none"> • Clinical Rotations C-FRC 4 (Clinical – Foundation, Rotation, Clerkships)
YEAR 5 (Clerkships)	<ul style="list-style-type: none"> • Gynecology & Obstetrics • Pediatrics • Medicine • Surgery <p>Clinical Clerkships C-FRC 5 (Clinical – Foundation, Rotation, Clerkships)</p>

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.



4. Block-5 Module Committee

BASIC HEALTH SCIENCES	CLINICAL SCIENCES
Anatomy: Prof. Dr. Quddus Ur Rehman	Medicine: Prof. Dr. Ghulam Abbas Sheikh
Physiology: Prof. Dr. Qamar Mehboob	Surgery: Prof. Dr. Asrar Ahmad
Biochemistry: Prof. Dr. Shakeel Ahmad	Radiology: Asst. Prof. Dr. Shemona
Community Medicine: Prof. Dr. Humayun Suqrat	Gynecology: Prof. Dr. Nazia Musarrat
Pathology: Prof. Dr. Kashif Baig	
Pharmacology: Dr. Sarwat Jahan	
Behavioral Sciences: Dr. Yawar	
Medical Education: Dr. Ayesha Sadiq	

Block Coordinator	Dr. Aneeqa
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Principal AFMDC	Prof. Dr. Ghulam Abbas Sheikh
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Atimah Medical & Dental



ENDOCRINOLOGY & REPRODUCTION-1 MODULE



5. Introduction of Endocrinology & Reproduction-1 Module

Welcome to the study guide for the Endocrinology and Reproduction module. This guide is designed to assist you in navigating the intricate and fascinating world of endocrine physiology and reproductive biology. As you embark on this learning journey, you will delve into the complex systems that regulate hormones and reproductive functions, gaining insights into their critical roles in maintaining homeostasis and ensuring species continuity.

Endocrinology, the study of hormones and their actions, explores the diverse and powerful chemical messengers that influence almost every aspect of our physiology. From growth and metabolism to mood and reproductive cycles, hormones orchestrate a symphony of bodily functions that are essential for health and well-being. This module will provide a comprehensive overview of endocrine glands, hormone biosynthesis, mechanisms of hormone action, and the regulatory feedback loops that maintain hormonal balance.

Reproduction, a fundamental biological process, involves the intricate interplay of hormones, organs, and behaviors that lead to the creation of new life. This segment of the module will cover the anatomy and physiology of the male and female reproductive systems, the hormonal regulation of reproductive processes, and the clinical aspects of reproductive health. You will explore topics such as gametogenesis, fertilization, pregnancy, and childbirth, as well as common reproductive disorders and their treatments.

We hope this study guide will be a valuable resource as you explore the dynamic and vital fields of endocrinology and reproduction. Prepare to be amazed by the intricate systems that sustain life and the remarkable processes that allow for the continuation of species.

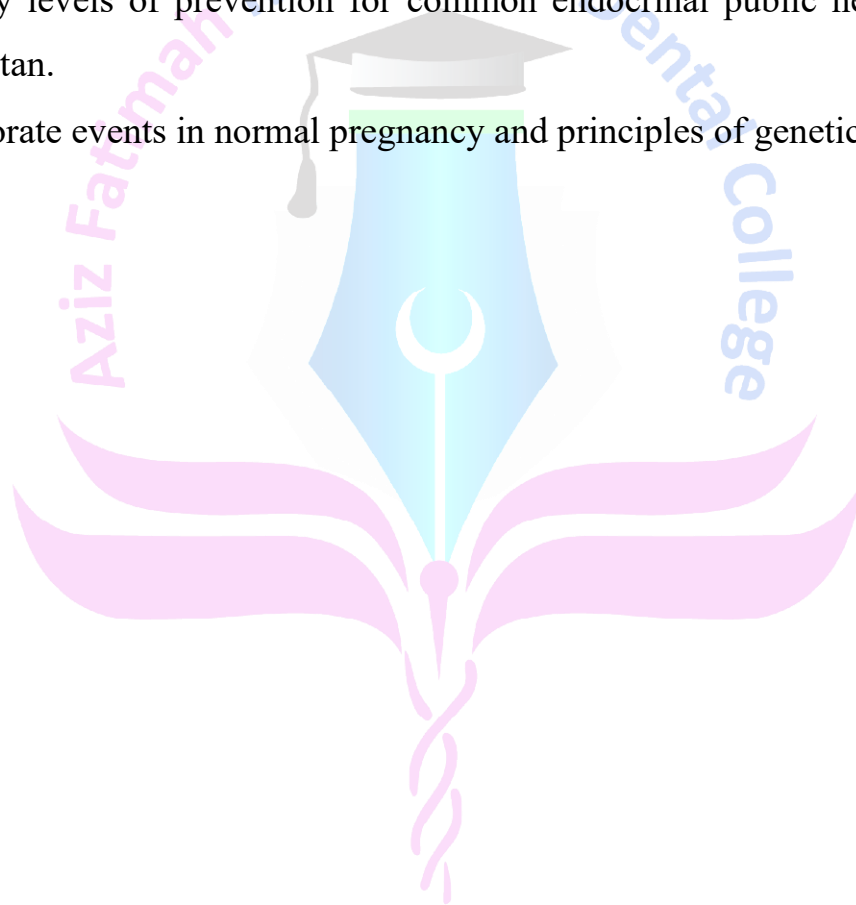
5.1. Module Rationale

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.



5.2. 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.



5.3. Learning Objectives

5.3.1. Knowledge

➤ Anatomy

Topic	Sub Topic	Learning objectives
Gross Anatomy	Diencephalon (Endocrinology)	<ul style="list-style-type: none"> Describe the location, anatomy blood supply and functions of pituitary gland
	Thyroid & Parathyroid gland	<ul style="list-style-type: none"> Describe the Thyroid, Parathyroid with their type, Relations, blood supply, and nerve supply. Explain the anatomical basis for surgical removal of the glands of neck with special emphasis on the complications that can be encountered Identify the Thyroid with their type, relations, blood supply, and nerve supply
	Testis	<ul style="list-style-type: none"> Describe the structure, fascia, coverings, blood and nerve supply of testis
	Accessory Male reproductive organs	<ul style="list-style-type: none"> Describe the gross anatomical features and neurovasculature of epididymis and vas deferens, Seminal vesicles, Bulbourethral gland
	Prostate	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Describe the anatomical basis and manifestations of the following conditions: <ol style="list-style-type: none"> Hydrocele of spermatic cord and/or testes Hematocele of testes Torsion of the spermatic cord Varicocele Vestigial remnants of embryonic genital duct Describe the anatomical basis of vasectomy, & metastasis of cancer of testis and scrotum
	Suprarenal Gland	<ul style="list-style-type: none"> Describe shape, relations blood supply & nerve supply of suprarenal gland Explain the anatomical causes of Adrenal Abnormalities
	Pelvic Girdle	<ul style="list-style-type: none"> Define Bony Pelvis (Girdle) and describe the

		<p>structures forming it.</p> <ul style="list-style-type: none"> Describe the bones and salient anatomical features of Bony pelvis (girdle)
	Sacroiliac Joint	<ul style="list-style-type: none"> Describe the type, articulations and mechanics of movements {axes and planes} of the following joints: <ol style="list-style-type: none"> Sacro-Iliac Pubic Symphysis Lumbosacral Sacrococcygeal
	Bony Pelvis (Girdle)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Describe the anatomical basis of pelvic fractures and their consequences Describe the topographical anatomy of pelvic walls and its components Describe the mechanics of changes occurring in pelvic ligaments and joint mobility in late pregnancy
	Pelvic floor	<ul style="list-style-type: none"> Describe the topographical anatomy of pelvic floor Describe origin, insertion, nerve supply and actions of muscle forming pelvic floor
	Pelvic Muscles	<ul style="list-style-type: none"> Tabulate the attachments, innervations and actions of muscles forming the pelvic walls and floor
	Pelvic Girdle	<ul style="list-style-type: none"> Describes injury to pelvic floor during child birth and its complications
	Peritoneum peritoneal cavity of pelvis	<ul style="list-style-type: none"> Describe the peritoneal reflections in the male and female pelvis
	Sacrum	<ul style="list-style-type: none"> Describe the gross anatomical features of Sacrum
	Pelvic Fascia	<ul style="list-style-type: none"> Describe the gross anatomical features of pelvic fascia
	Pelvic outlet and inlet	<ul style="list-style-type: none"> Describe the boundaries of pelvic outlet and inlet Enumerate the structures passing through the pelvic inlet and pelvic outlet
	Peritoneal Reflection in Pelvis	<ul style="list-style-type: none"> Tabulate the differences in peritoneal reflections in male and female pelvis

	Pelvic Vessels	<ul style="list-style-type: none"> • Describe the origin, course, branches and distribution of common iliac artery • Describe the origin, course, branches and distribution of external and internal iliac arteries • Describe the origin, course, tributaries and area of drainage of pelvic veins
	Pelvic Lymph Nodes	<ul style="list-style-type: none"> • Describe the location, afferents and efferent of pelvic lymph nodes
	Pelvic Vessels & Pelvic nerves	<ul style="list-style-type: none"> • Tabulate the origin, course, distribution and anastomosis of arteries of the pelvis • Describe the origin, root value, course, relations, branches and distribution of Pelvic nerves • Describe the anatomical basis and clinical picture for ligation of internal iliac artery and collateral circulation in pelvis • Describe the clinical picture and anatomical basis for the injury to pelvic nerves • Give anatomical justification for pelvic nerve blocks
	Pelvis	<ul style="list-style-type: none"> • Describe the morphological features of Urethra (male and female) • Tabulate the parts of the male urethra with their location and salient features • Describe the clinical picture and anatomical justification for Ureteric Caliculi, Cystocele, Suprapubic Cystotomy, Rupture of Bladder • Describe the clinical picture and anatomical justification for Hypertrophy of Prostate • Describe the gross anatomical features of Ovaries and Fallopian Tubes with their relations, blood supply, nerve supply and lymphatic drainage • Describe related clinical conditions: <ol style="list-style-type: none"> 1) Positions of ovaries 2) Cysts of ovaries 3) Ectopic pregnancy 4) Tubal ligation 5) Salpingitis • Describe the gross anatomical features, parts, peritoneal ligaments, blood supply, nerve supply & lymphatic & clinical aspects of Uterus and Vagina • Describe related clinical conditions

		<ol style="list-style-type: none"> 1. Prolapse of uterus 2. Vaginal trauma 3. culdocentesis <ul style="list-style-type: none"> • Describe, identify, justify and demonstrate the supports of uterus
	Perineum	<ul style="list-style-type: none"> • Describe the gross anatomical features of Boundaries & divisions of perineum • Draw and label the boundaries of perineum • List the contents of perineum • Tabulate the differences between the Male and female perineum • Describe the attachments of the perineal membrane and list its relations • Discuss the formation of Superficial and Deep Perineal Pouches • List the contents of Superficial and Deep Perineal Spaces • Tabulate the attachments, actions and nerve supply of muscles of perineum • Describe the topographical anatomy and neurovasculature of Penis • Tabulate the muscles forming the perineal body with their attachments and nerve supply
	Pelvis	<ul style="list-style-type: none"> • Describe the clinical presentation and anatomical justification for: <ol style="list-style-type: none"> 1) Hypospadias 2) Phimosis 3) Circumcision 4) Erectile Dysfunction 5) Internal Hernias 6) Suprapubic Cystotomy 7) Rupture Of Bladder 8) Rectal Examination 9) Disposition Of Uterus
	Mammary Gland	<ul style="list-style-type: none"> • Describe the extent, structure, vascular supply, lymphatic drainage of Breast (Mammary Glands) • Demonstrate palpation of breast and define its relation to the Fibrous septa in Carcinoma of Breast • Explain the anatomical basis of position adopted for breast examination and mammography.
		<ul style="list-style-type: none"> • Describe the contributing factors, histogenesis and sequence of events of the development of

Embryology & Post-Natal Development	Development of Thyroid gland	<p>Thyroid gland</p> <ul style="list-style-type: none"> • Explain the embryological basis of the Thyroglossal Cyst • Draw a concept map highlighting the development of thyroid gland
	Development Of Parathyroid gland	<ul style="list-style-type: none"> • Describe the development of para-thyroid glands • Draw a concept map highlighting the development of para-thyroid gland
	Development of Thyroid, Parathyroid	<ul style="list-style-type: none"> • Anatomically justify the clinical presentation of: <ol style="list-style-type: none"> 1. Ectopic Parathyroid 2. Aberrant Thyroid
	Development of Pituitary Gland	<ul style="list-style-type: none"> • Describe the development of pituitary gland • Describe the embryological basis for the congenital anomalies of pituitary development
	Development Of Adrenal Gland	<ul style="list-style-type: none"> • Describe the contributing factors, histogenesis and the development of adrenal gland • Draw a concept map for the development of adrenal gland • Describe the embryological basis for the congenital anomalies of adrenal development
	Adrenal Gland	<ul style="list-style-type: none"> • Identify the stages in the development of the adrenal gland
	Development of the Reproductive system	<ul style="list-style-type: none"> • Describe the indifferent gonads • List and describe the Factors influencing the differentiation of gonads • Evaluate the role of the factors influencing Sex determination and differentiation • Describe the Development and descent of testis
	Testis	<ul style="list-style-type: none"> • Describe the embryological basis and locations of undescended testes
	Development of Reproductive	<ul style="list-style-type: none"> • Draw a concept map highlighting the development of testis • Explain the Development and descent of ovaries • Draw a concept map highlighting the development of ovaries Anatomy • Describe the anatomical basis for indifferent gonads, Klinefelter, Turner syndrome & androgen insufficiency • Describe the Formation of Genital Ducts In different stage (paramesonephric and

	system	<p>mesonephric ducts)</p> <ul style="list-style-type: none"> Describe the development of female genital ducts and glands, Development of uterus & Vagina. Describe related clinical anomalies: <ol style="list-style-type: none"> 1) Uterus Arcuatus 2) Uterus septus 3) Uterus Bicornis Bicolis 4) Uterus Bicornis Unicollis 5) Uterus Unicornis 6) Atresia of vagina 7) Double vagina 8) Imperforate hymen Describe the development of male genital ducts and glands Discuss the Development of male external genitalia Describe the Development of female external genitalia Explain the anatomical basis for the Associated congenital anomalies of male and female external genitalia (Hyposidiasis, Epispidiasis) Describe the development of inguinal canal and descent of testis and embryological basis for Cryptorchidism, Ectopic Testis, Congenital Inguinal Hernia, Hydrocele Klinefelter, turner syndromes & androgen insufficiency Describe the embryological basis for the coverings of testis
Microscopic Anatomy (Histology & Pathology)	Stomach	<ul style="list-style-type: none"> Describe the histological basis and manifestation of Gastric Carcinoid Tumors Classify the principal Enteroendocrine Cells on the basis of type, location, hormone produced and Actions
	Pituitary Gland	<ul style="list-style-type: none"> Describe microscopic structure of Pituitary gland. Classify pituitary gland on the basis of cell type, hormone produced and functions Explain the histological basis and manifestation of Pituitary Adenomas
	Adrenal Gland	<ul style="list-style-type: none"> Describe the light microscopic structure of Adrenal Gland Explain the histological basis and manifestation of Addison disease

Pancreas	<ul style="list-style-type: none"> Describe the light microscopic structure of endocrine pancreas Classify the pancreatic islets on the basis of cell type, hormone produced and functions Explain the histological basis and manifestation of Diabetes Mellitus Explain the components and functions of neuroendocrine system
Thyroid Gland	<ul style="list-style-type: none"> Describe the light microscopic structure of Thyroid Gland Describe the light microscopic structure of Parathyroid Gland Describe the light microscopic structure of Pineal gland
Testes	<ul style="list-style-type: none"> Describe the light and ultramicroscopic structure of Testes, structure & function of Sertoli cells. Describe Blood testes Barrier Describe the histological basis and manifestation of Orchitis, Cryptorchidism
Epididymis	<ul style="list-style-type: none"> Describe the light microscopic structure of Epididymis
Vas deferens	<ul style="list-style-type: none"> Describe the light microscopic structure of vas deferens
Seminal Vesicle	<ul style="list-style-type: none"> Describe the light microscopic structure of seminal vesicle
Prostate gland	<ul style="list-style-type: none"> Describe the light microscopic structure of Prostate Describe the lobes of prostate and correlate with the pathologies of prostate Gland
Ovaries	<ul style="list-style-type: none"> Describe the light microscopic structure of ovaries Describe the light microscopic structure of ovarian follicles in different stages of menstrual cycle. Describe the histological basis and manifestation of Polycystic Ovary Syndrome
Uterus	<ul style="list-style-type: none"> Discuss the light microscopic structure of uterus Describe the light microscopic structure of different stages of Menstrual cycle Describe the histological basis and manifestation of Endometriosis
Fallopian Tube	<ul style="list-style-type: none"> Describe the light microscopic structure of Fallopian Tube.
	<ul style="list-style-type: none"> Describe the light microscopic structure of

	Cervix	<p>Cervix</p> <ul style="list-style-type: none"> Describe the histological basis and manifestation of Cervical Carcinoma
	Vagina	<ul style="list-style-type: none"> Describe the light microscopic structure of Vagina
	Mammary Gland	<ul style="list-style-type: none"> Describe light microscopic structure of mammary gland (inactive, during pregnancy, after lactation) Discuss histological basis of Breast cancer

➤ **Physiology**

Topic	Sub Topic	Learning objectives
Medical Physiology	Introduction to Endocrinology	<ul style="list-style-type: none"> Define different chemical messengers. Enlist endocrine organs and hormones of the body. Enlist the hormones on the basis of chemical nature. Discuss the feedback control of hormone secretion. Explain the up and down regulation of receptors. Enlist the location of hormone receptors Explain the mechanism of intracellular signaling after hormone receptor activation. Name the hormones that use enzyme-linked hormone receptors signaling. Explain the mechanism of enzyme linked receptors. Enlist second messenger mechanisms for mediating intracellular hormonal functions. Define second messenger system. Explain the adenylyl cyclase– cAMP Second Messenger System. Enumerate the hormones that use the adenylyl cyclase– cAMP Second Messenger System. Explain the cell membrane phospholipid second messenger System. Enumerate the hormones that use cell membrane phospholipid second messenger system. Explain the mechanism of calcium Calmodulin system

	<p>Hypothalamus / Pituitary Gland</p>	<ul style="list-style-type: none"> • Name the hormones/ factors of hypothalamus. • Name the hormones of anterior pituitary. • Name the hormones of posterior pituitary. • Describe the functional relationship between hypothalamus, anterior and posterior pituitary gland. • Explain the significance of hypothalamic-hypophysial portal circulation. • Explain the hypothalamic pituitary tract. • Explain the mechanism of action of growth hormone. • Explain the actions of Growth hormone on Carbohydrate. • Discuss the actions of Growth hormone on protein metabolism. • Describe the actions of Growth hormone on fat metabolism. • Explain the effect of growth hormone on skeletal growth and age. • Explain the significance of somatomedins in mediating the actions of growth hormone. • Describe the regulation of Growth Hormone. • Describe the causes and features and treatment of panhypopituitarism in adults and childhood. • Define Sheehan's syndrome. • Enlist the types of dwarfism according to cause. • Explain the pathophysiology and features of gigantism and acromegaly. • Explain the mechanism of action of antidiuretic hormone. • Discuss the actions of antidiuretic hormone. Regulation of antidiuretic hormone production. • Elaborate the mechanism of action of oxytocin. • Discuss the actions of oxytocin.
		<ul style="list-style-type: none"> • Discuss the transport of thyroid hormone • Discuss the mechanism of action of thyroid hormone • Explain the actions of thyroid hormone on carbohydrate metabolism • Discuss the actions of thyroid hormone on protein metabolism

	Thyroid gland	<ul style="list-style-type: none"> • Explain the actions of thyroid hormones on fat metabolism • Explain the non-metabolic functions of thyroid hormone • Explain the regulation of thyroid hormone • Enumerate antithyroid substances and explain their mechanism of action • Enumerate the causes of hyperthyroidism • Explain the features, pathophysiology and treatment of thyrotoxicosis/ grave's disease • Explain the thyroid function test to investigate hypo and hyperthyroidism Enlist the causes of hypothyroidism • Explain the pathophysiology of Hashimoto hypothyroidism • Discuss the features and pathophysiology and treatment of myxedema • Explain the pathophysiology and features of endemic colloid goiter • Discuss the pathophysiology and features of nontoxic colloid goiter • Enlist the causes of cretinism • Discuss the features and pathophysiology of cretinism
	Adreno cortical hormones	<ul style="list-style-type: none"> • Name the hormones of adrenal cortex. • Explain the physiological anatomy of adrenal cortex. • Explain the cellular mechanism of Aldosterone action. • Explain the effects of mineralocorticoid hormone. • Discuss the regulation of aldosterone secretion. • Discuss the metabolic and non-metabolic functions of cortisol • Explain the interconversion of active cortisol and inactive cortisone by the 2, 11 beta hydroxysteroid dehydrogenase isoform. • Explain the mechanism for regulation of glucocorticoid secretion by hypothalamus and pituitary • Name adrenal androgens and enlist the functions of adrenal androgens. • Discuss the causes, features, pathophysiology and treatment of hypoadrenalism (Addison's disease). • Enlist the causes of hyperadrenalism.

		<ul style="list-style-type: none"> • Explain the features, pathophysiology and treatment of Cushing's syndrome. Differentiate between Cushing's syndrome and Cushing's disease • Explain the clinical importance of dexamethasone suppression test to diagnose Cushing's syndrome. • Discuss the features, pathophysiology and treatment of Conn's syndrome. • Enlist the cause, features and pathophysiology of congenital adrenal hyperplasia/ Androgenital syndrome
	Pancreatic hormones	<ul style="list-style-type: none"> • Enumerate the types of pancreatic cells with their hormones. • Explain the mechanism of action of insulin. • Discuss the synthesis and mechanism of release of insulin. • Explain the effects of insulin on carbohydrate, protein and lipid metabolism. • Enlist the actions of insulin on liver, adipose tissue and skeletal muscle. • Enlist the factors and conditions that increase or decrease insulin secretion • Explain the role of insulin (and other hormones) in "switching" between carbohydrate and lipid metabolism. • Discuss the effects of glucagon on carbohydrate and lipid metabolism. • Explain the factors that regulate the secretion of glucagon. • Explain the 24-hour regulation of glucose. • Discuss the importance of blood glucose regulation. • Explain the actions of somatostatin
	Abnormalities of Glucose regulation	<ul style="list-style-type: none"> • Enlist the types of diabetes mellitus • Explain the causes of Type I and type II diabetes mellitus • Discuss the features and pathophysiology of diabetes mellitus • Explain the role of insulin resistance, obesity and metabolic syndrome in developing type II diabetes mellitus • Explain how to diagnose the diabetes mellitus • Explain the treatment of type I and type II diabetes mellitus

		<ul style="list-style-type: none"> • Explain the features, cause of insulinoma
	Parathyroid hormones	<ul style="list-style-type: none"> • Discuss the physiological anatomy of parathyroid gland • Explain the rapid and slow mechanism of resorption of bone by parathyroid hormone • Discuss the actions of parathyroid • Explain the control of parathyroid secretion by calcium ion concentration
	Regulation of calcium in body	<ul style="list-style-type: none"> • Discuss the effects of Vitamin D • Discuss the effects of calcitonin on calcium • Discuss the regulation of calcium (the first & second line of defense) • Explain the causes and features of hypoparathyroidism • Explain the causes and the features of primary and secondary hyperparathyroidism • Enumerate the causes and features of osteoporosis
	Adreno medullary hormones	<ul style="list-style-type: none"> • Enlist the functions of adrenal medullary hormones and explain pheochromocytoma
	Spermatogenesis Capacitation & Acrosome reaction	<ul style="list-style-type: none"> • Describe the hormonal factors that affect spermatogenesis • Explain the maturation and storage of sperm in epididymis • Discuss the structure and physiology of a mature sperm • Describe the composition of semen • Discuss the functions of prostate & seminal vesicles in the formation of semen • Explain the phenomenon of capacitation and its significance • Describe the acrosome Reaction and its significance • Discuss the role of pineal gland in reproduction
	Testosterone	<ul style="list-style-type: none"> • Discuss the site of secretion of testosterone • Name the active form of testosterone • Explain the production of estrogen in males • Describe the basic intracellular mechanism of action of testosterone • Explain the functions of testosterone in intrauterine life and after birth • Discuss the regulation of male sexual functions by hormones from the hypothalamus and anterior pituitary gland
		<ul style="list-style-type: none"> • Enumerate and explain the phases of ovarian cycle along with the hormonal changes

	Menstrual cycle	<ul style="list-style-type: none"> • Explain the postulated mechanism of ovulation • Explain the formation and involution of Corpus luteum Endometrial cycle • Explain the structural and hormonal changes of endometrial cycle • Explain the regulation of female monthly cycle • Discuss the role of progesterone on female sexual organs
	Female sexual hormones	<ul style="list-style-type: none"> • Enumerate the ovarian hormones • Discuss the synthesis of estrogen and progesterone • Describe the interaction of follicular theca and granulosa cells for production of estrogens with the help of a diagram • Explain the functions of the estrogens on different organs • Discuss the role of progesterone on female sexual organs
	Puberty, menarche & menopause	<ul style="list-style-type: none"> • Explain the physiological basis of puberty, menarche • Define menopause • Explain the cause of menopause • Discuss the physiological changes in the function of the body at the time of menopause
	Normal Pregnancy	<ul style="list-style-type: none"> • Explain the non-hormonal functions of placenta • Explain the hormonal factors in pregnancy/ hormones of placenta • Explain the changes in non- placental hormones during pregnancy Response of the mother's body to pregnancy • Explain the mechanical and hormonal factors that increase uterine contractility during parturition
	Lactation	<ul style="list-style-type: none"> • Explain the physiology of lactation • Discuss the actions of prolactin • Justify the suppression of ejection of milk during pregnancy • Discuss the physiological basis of suppression of the female ovarian cycles in nursing mothers for many months after delivery

➤ **Medical Biochemistry**

Topic	Sub Topic	Learning objectives
Medical Biochemistry	Introduction to Endocrinology	<ul style="list-style-type: none"> • Define different chemical messengers. • Enlist endocrine organs and hormones of the body. • Enlist the hormones on the basis of chemical nature. • Discuss the feedback control of hormone secretion. • Explain the up and down regulation of receptors. • Enlist the location of hormone receptors. • Explain the mechanism of intracellular signaling after hormone receptor activation. • Name the hormones that use enzyme-linked hormone receptors signaling. • Explain the mechanism of enzyme linked receptors. • Explain the mechanism of hormones that receptors present in cytoplasm and nucleus (act on genetic machinery). • Enlist second messenger mechanisms for mediating intracellular hormonal functions. • Define second messenger system. • Explain the adenylyl cyclase– cAMP Second Messenger System. • Enumerate the hormones that use the adenylyl cyclase– cAMP Second Messenger System. • Explain the cell membrane phospholipid second messenger System. • Enumerate the hormones that use cell membrane phospholipid second messenger system. • Explain the mechanism of calcium Calmodulin system
	Signal Transduction	<ul style="list-style-type: none"> • Describe the features of Signal transduction • Describe different types of receptors
	Classification of hormones	<ul style="list-style-type: none"> • Discuss the classification of hormones
	Second messengers	<ul style="list-style-type: none"> • Describe different types of second messengers • Differentiate the G protein and non-G protein mediated pathways of signal transduction

		<ul style="list-style-type: none"> • Discuss the hormones which act through: Cyclic AMP (Adenosine monophosphate) • Discuss the hormones which act through: Cyclic GMP (guanosine monophosphate) • Discuss the hormones which act through calcium phosphoinositol • Describe the Receptor tyrosine kinase pathway of signal transduction • Explain the Serine threonine kinase pathway of signal transduction • Discuss the Nuclear Receptor mediated pathway of signal transduction • Describe the Receptor coupled to Jak Stat pathway of signal transduction • Explain the control and negative feedback mechanism of hormone regulation • Discuss the biosynthesis, secretion, mechanism of action and metabolic functions of Insulin, glucagon, epinephrine, cortisol, thyroid and growth hormone with special reference to carbohydrate, protein and lipid metabolism • Interpret disorders of hormones on the basis of sign, symptoms and given data
	Synthesis of Hormones	<ul style="list-style-type: none"> • Explain the synthesis, secretion, transport and clearance of steroid and protein hormone
	Synthesis of ACTH & adrenocortical	<ul style="list-style-type: none"> • Enlist the steps in the synthesis of adrenocortical hormone. • Explain the synthesis and secretion of ACTH (Adrenocorticotrophic hormone) in association with melanocyte-stimulating hormone, lipotropin, and endorphin
	Synthesis of testosterone, progesterone and estrogen	<ul style="list-style-type: none"> • Explain the structure, biosynthesis, secretion, transport, regulation, catabolism, mechanism of action and biochemical role of testosterone, progesterone and estrogen
	Steroid in infertility	<ul style="list-style-type: none"> • Discuss the role of steroid hormones in oral contraception, Infertility
	Nomenclature of genetics	<ul style="list-style-type: none"> • Define the following terms: chromosome, allele (dominant and recessive), gene, locus, heterozygote, homozygote, hemizygous, autosome, genotype, phenotype, haploid and diploid number of chromosomes, aneuploidy, proband, proposita, pedigree, propositus, penetrance, codominance and polygenic

Genes	<ul style="list-style-type: none"> Discuss the structures of genes, how they are organized and regulated.
Mendelian laws	<ul style="list-style-type: none"> Describe Mendelian Law of Segregation and Law of Independent Assortment.
Patterns of inheritance	<ul style="list-style-type: none"> Describe the patterns of inheritance characteristic of autosomal dominant, autosomal recessive, X- linked dominant, X-linked recessive and mitochondrial traits.
Pedigrees	<ul style="list-style-type: none"> Interpret genetic symbols as they appear in pedigrees
Mode of inheritance	<ul style="list-style-type: none"> Analyze pedigree to determine the mode of inheritance of following traits: <ol style="list-style-type: none"> X-linked recessive (Duchenne Muscular dystrophy) X-linked dominant (Rickets) Autosomal recessive (Xeroderma Pigmentosum) Autosomal dominant (Huntington's Disease)) Mitochondrial disorder (Mitochondrial diabetes)
Chromosomal abnormalities	<ul style="list-style-type: none"> Discuss different structural and numerical chromosomal abnormalities
Karyotypes	<ul style="list-style-type: none"> Interpret the normal human karyotype in terms of number and structure of chromosomes
Mutations	<ul style="list-style-type: none"> Describe the effect of the following chromosomal mutations on a segment of DNA: point mutation, frameshift mutation, deletion, insertion, inversion, Robertsonian Translocation and mosaicism.
Central dogma	<ul style="list-style-type: none"> Discuss the concept of central dogma from gene to protein
Prokaryotic DNA replication	<ul style="list-style-type: none"> Describe in detail all the steps in prokaryotic DNA replication with emphasis on: Different proteins required, Primers, DNA polymerase; their different components and functions, Initiation, elongation and termination of replication, Topoisomerases
Eukaryotic DNA replication	<ul style="list-style-type: none"> Describe in detail all the steps in Eukaryotic DNA replication with emphasis on differences between Pro and Eukaryote
Telomeres and Telomerase	<ul style="list-style-type: none"> Discuss telomeres and Telomerase and their clinical significance
DNA Repair	<ul style="list-style-type: none"> Describe DNA repair, mutation and cancers Interpret Xeroderma pigmentosa on basis of

		sign /symptoms and data
	Transcription in prokaryotes	<ul style="list-style-type: none"> Explain the transcription in prokaryotes focusing on the following key points; RNA polymerase, its components and functions, Initiation, elongation and termination of transcription.
	Transcription in Eukaryotes	<ul style="list-style-type: none"> Illustrate the transcription in eukaryotes focusing on the differences between pro- and eukaryotic replication
	Post transcriptional modifications	<ul style="list-style-type: none"> Discuss post transcriptional modifications
	Wobble hypothesis	<ul style="list-style-type: none"> Describe the role of Wobble hypothesis in codon recognition by tRNA
	Translation	<ul style="list-style-type: none"> Interpret the translation focusing on the following key points: Initiation, elongation and termination
	Post translational modification	<ul style="list-style-type: none"> Describe post-translational modification of proteins Illustrate RNA dependent synthesis of RNA and DNA
	Gene Expression	<ul style="list-style-type: none"> Discuss the gene expression especially Lac operon and Tryptophan operon Discuss the regulation of eukaryotic gene expression with special emphasis on iron metabolism and RNA interference
	Techniques	<ul style="list-style-type: none"> Discuss the following Recombinant DNA techniques with reference to their principles, procedures and application: <ol style="list-style-type: none"> 1) PCR (Polymerase Chain Reaction) 2) RFLP (Restriction Fragment Length Polymorphism) 3) Cloning 4) Human Genome Project 5) Blotting Techniques 6) DNA (Deoxyribose Nucleic Acid) sequencing

➤ **Aging**

Topic	Sub Topic	Learning objectives
Aging	Menopause	<ul style="list-style-type: none"> Enlist the changes that occur in female body after menopause.

➤ Pathophysiology and Pharmacotherapeutics

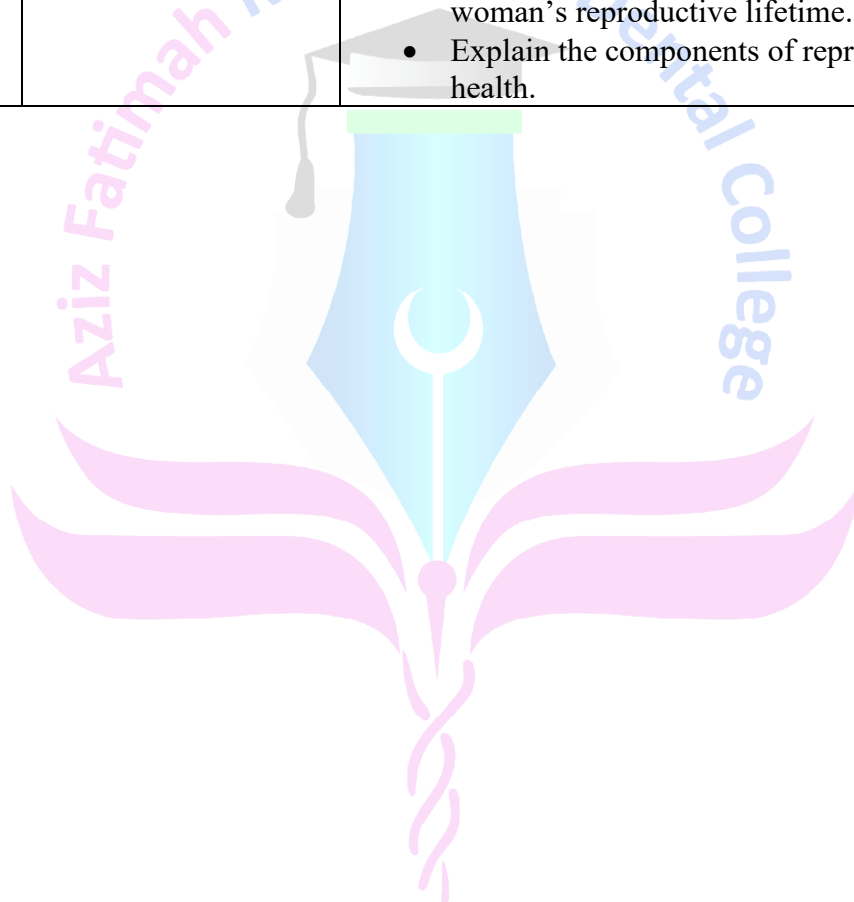
Topic	Sub Topic	Learning objectives
Pharmacology	Anti-thyroid substance & MOA, uses, effects	<ul style="list-style-type: none"> • Explain the mechanism of action of thyroxine • Explain Clinical uses and potential adverse effects with use of Thyroxine.
Pathology	Pathology of Anterior Pituitary Gland	<ul style="list-style-type: none"> • Enumerate clinical manifestations along with hormone levels of anterior pituitary • Classification of pituitary adenomas
	Pathology of Posterior Pituitary Gland	<ul style="list-style-type: none"> • Enumerate and describe posterior pituitary syndromes (inappropriate ADH (Anti Diuretic Hormone) secretion, diabetes insipidus)
	Thyroiditis	<ul style="list-style-type: none"> • Define thyroiditis • Describe salient morphological features of clinically significant subtypes of thyroiditis <ol style="list-style-type: none"> i. Hashimoto Thyroiditis ii. Granulomatous Thyroiditis
	Grave's Disease	<ul style="list-style-type: none"> • Describe the pathogenesis & salient morphological features of Grave's Disease • Describe the pathogenesis & salient morphological features of Diffuse and Multinodular goiter
	Pathology of Thyroid Gland	<ul style="list-style-type: none"> • Enumerate causes of hypo and hyperthyroidism along with levels of thyroid hormones
	Pathology of Parathyroid Gland	<ul style="list-style-type: none"> • Enumerate causes of hypercalcemia, hyper and hypoparathyroidism • Describe the histopathological features of parathyroid hyperplasia
	Pathology of Endocrine Pancreas Gland	<ul style="list-style-type: none"> • Give etiological Classification of DM (Diabetes Mellitus) • Differentiating features of DM-I and DM-II on the basis of pathogenesis, clinical features, diagnosis and complications
	Pathology of Adrenal Gland	<ul style="list-style-type: none"> • Enumerate causes of Cushing syndrome with lab investigations • Causes and clinical features of adrenocortical insufficiency (Addison disease)
	Breast	<ul style="list-style-type: none"> • Describe the morphological features of inflammatory disorders of breast.
Female	<ul style="list-style-type: none"> • Enumerate causes of lower genital tract 	

	Reproductive Pathology	<p>infections and PIDs along with lab investigations</p> <ul style="list-style-type: none"> • Enumerate causes of infertility in females along with hormonal investigations • Causes of dysfunctional uterine bleeding with histopathological features • Pathophysiology and lab diagnosis of eclampsia and preeclampsia • Causes of placental implantations (ectopic pregnancy)
	Male Reproductive Pathology	<ul style="list-style-type: none"> • Enumerate causes of inflammation of male genital tract • Causes of male infertility with semen analysis • Describe pathological features of testicular torsion

➤ **Disease Prevention & Impact**

Topic	Sub Topic	Learning objectives
Behavioral Sciences	Sexual difficulties and Medical Practices	<ul style="list-style-type: none"> • Discuss common sexual dysfunctions and their prevalence, with emphasis on culture bound syndromes. • Identify the various biological, psychological, and relational factors that can contribute to sexual difficulties. • Discuss barriers to seek help. • Discuss the importance of person centered and nonjudgmental approach when discussing sexual health concerns. • Explain the ethical obligations of healthcare professionals in respecting patient confidentiality and informed consent when addressing sexual health issues.
Community Medicine	Diabetes	<ul style="list-style-type: none"> • Define Diabetes Mellitus according to WHO (World Health Organization) criteria • Classify types of Diabetes Mellitus • Describe epidemiological risk factors for Diabetes • Epidemiological distribution & statistics of DM • Screening of community for Diabetes • Apply levels of prevention for control of Diabetes

	Genetics	<ul style="list-style-type: none"> • Classify types of genetic disorders common in community. Describe health promotional measures to control genetic diseases. • Describe screening programs for community to prevent genetic disorders. • Apply levels of preventive and social measures for control of genetic abnormalities
	Reproductive health	<ul style="list-style-type: none"> • Define women health and life cycle approach for health related events. • Highlight statistics related to human reproductive health issues. • Enumerate health related problems across a woman's reproductive lifetime. • Explain the components of reproductive health.



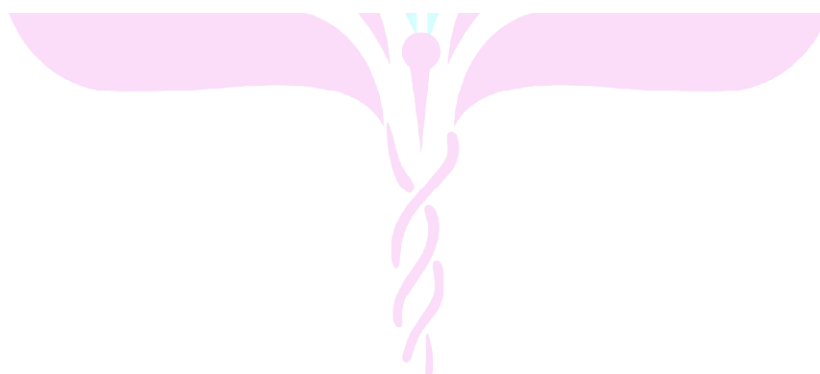
5.3.2. Skills

➤ Practical

Topic	Sub Topic	Learning objectives
Histology	Pituitary gland	<ul style="list-style-type: none"> Identify draw & Label the Pituitary gland under light microscope
	Thyroid & Parathyroid	<ul style="list-style-type: none"> Identify draw & label the Thyroid & Parathyroid glands under light microscope
	Adrenal Gland	<ul style="list-style-type: none"> Identify draw & Label the Adrenal gland under light microscope
	Testes Epididymis Vas Deferens	<ul style="list-style-type: none"> Identify draw & Label Testes, Epididymis & Vas deferens under the light Microscope
	Seminal Vesicle Prostate Gland	<ul style="list-style-type: none"> Identify draw & label the seminal vesicle & prostate gland under light Microscope
	Ovaries	<ul style="list-style-type: none"> Identify, draw and label the ovaries under light microscope
	Uterus	<ul style="list-style-type: none"> Identify, draw and label the slide of different phases of uterus under light microscope
	Fallopian Tube	<ul style="list-style-type: none"> Identify, draw and label the fallopian tube under light microscope
	Cervix	<ul style="list-style-type: none"> Identify, draw and label the cervix under light microscope
	Vagina	<ul style="list-style-type: none"> Identify, draw and label the vagina under light microscope
	Mammary gland	<ul style="list-style-type: none"> Identify, draw and label the mammary gland (different stages) under light microscope
Biochemistry	DNA	<ul style="list-style-type: none"> Demonstrate DNA extraction
	Electrophoresis	<ul style="list-style-type: none"> Demonstrate Electrophoresis
	PCR	<ul style="list-style-type: none"> Demonstrate PCR
	ELISA	<ul style="list-style-type: none"> Demonstrate ELISA (enzyme-linked immunoassay) to measure concentration of hormones
Physiology	Pregnancy test	<ul style="list-style-type: none"> Perform Pregnancy test

5.3.3. C-FRC for Endocrinology & Reproduction-1 Module

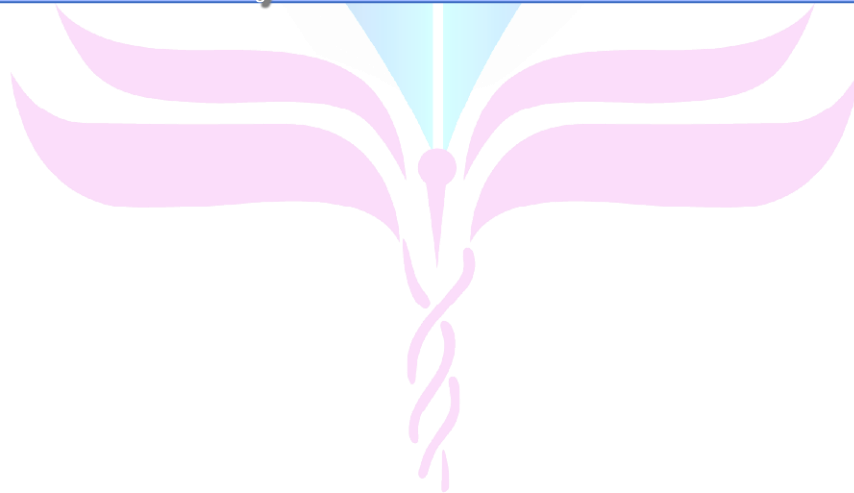
ENDOCRINOLOGY & REPRODUCTION-1 MODULE		
Objectives	Skill	Miller's Pyramid Level Reflected
Examination of the thyroid gland	Thyroid examination	Shows
Examination for Acromegaly	Examination for acromegaly	Shows
Measurement of blood glucose levels	Blood sugar measurement	Shows
Suturing	Suturing	*Knows how



Al-Fatihah Medical & Dental



HEAD & NECK, SPECIAL SENSES MODULE



6. Introduction of Head & Neck, Special Senses Module

Welcome to the study guide for the Head & Neck and Special Senses module. This comprehensive guide is crafted to support your exploration of the intricate anatomy, physiology, and clinical aspects of the head, neck, and the special senses. As you embark on this educational journey, you will delve into the complexities of these regions, gaining a profound understanding of their critical functions and the ways in which they contribute to our daily lives.

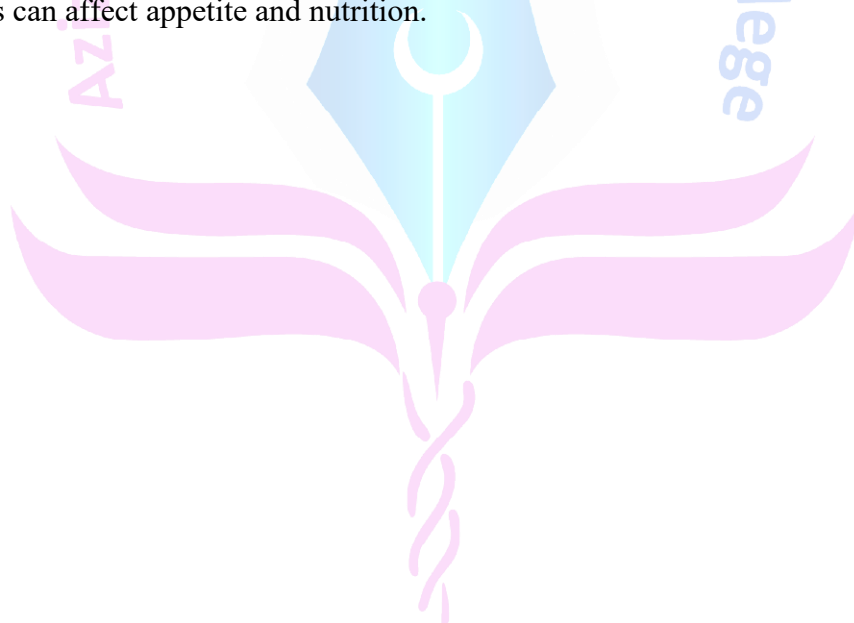
The head and neck region houses a multitude of vital structures, including the brain, cranial nerves, major blood vessels, and the upper respiratory and digestive tracts. This module will provide an in-depth examination of the anatomy and physiology of these areas, emphasizing their roles in maintaining essential bodily functions. You will explore the structural intricacies and the interconnected systems that support movement, sensation, communication, and more.

The special senses—vision, hearing, taste, smell, and balance—are our primary means of interacting with the environment. This segment of the module will cover the anatomy and physiology of the sensory organs and pathways, elucidating how we perceive and interpret sensory information. Topics such as the visual and auditory systems, olfactory and gustatory pathways, and the vestibular system will be thoroughly examined, providing insights into their complex mechanisms and functions.

We hope this study guide will serve as a valuable resource as you explore the fascinating anatomy and physiology of the head and neck, along with the extraordinary capabilities of the special senses. Prepare to be captivated by the complexity and precision of these systems, and the crucial roles they play in our interactions with the world. Happy studying!

6.1. 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, 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.



6.2. 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.

6.3. Learning Objectives

6.3.1. Knowledge

➤ Thorax

Topic	Sub Topic	Learning objectives
Gross Anatomy	Vision	<ul style="list-style-type: none"> • Define the boundaries and openings of orbital cavity. List orbital contents and structures traversing these openings. • In a tabulated manner list the extraocular and intraocular muscles of eyeball giving their nerve supply and actions • List and define the movements of eyeball with special reference to orbital and visual axis • Describe the functional modalities, course, distribution, branches of oculomotor, Trochlear and Abducent nerve. • Describe the location, roots and distribution of ciliary ganglion. • Describe the course and distribution of optic nerve in reference to visual pathway. • Give the effects of its lesions. Give the clinical correlates of nerves supplying the eyeball and its muscles. • Give anatomical justification for Horner's syndrome. • Describe the course and branches of ophthalmic artery mentioning its origin and termination. • Describe the structure of eyelids, conjunctiva and tarsal glands with their neurovascular supply • List the parts of lacrimal apparatus

		<p>giving their location and anatomical features.</p> <ul style="list-style-type: none"> • Describe the nerve supply of lacrimal gland. • Describe the location, roots and distribution of pterygopalatine ganglia • Give the anatomical structure of eyeball emphasizing on its three coats and their neurovascular supply
	<p>Nasal cavity and the paranasal sinuses</p>	<ul style="list-style-type: none"> • Describe the boundaries of nasal cavity: nasal septum, lateral wall of nose, roof and floor. • Give their anatomical features and neurovascular supply. • Describe the anatomical features and neurovascular supply of external nose • List the paranasal sinuses giving their locations, openings, neurovascular supply and clinical significance. • Describe the course and distribution of olfactory nerve in reference to olfactory pathway. Give the effects of its lesions. • Describe the anatomical features and neurovascular supply of external ear
	<p>Hearing</p>	<ul style="list-style-type: none"> • Describe the boundaries, contents, neurovascular supply and communications of middle ear cavity. • Describe the parts, anatomical features and neurovascular supply of internal ear. • Describe the course and distribution of vestibulocochlear nerve mentioning the effects of its lesion. • Describe auditory pathway.

	Taste	<ul style="list-style-type: none"> • Describe the anatomical features of tongue with emphasis on its mucosa, attachments, musculature, vascular supply and lymphatic drainage. • Describe the nerve supply of tongue (general sensory, special sensory and motor) with reference to their lesions and embryological basis. • List taste buds mentioning their structure, location and nerve supply. Describe the taste pathway. • Discuss lesions of motor and sensory nerves supplying the tongue. Discuss the anatomical correlates of lingual carcinoma in reference to lymphatic drainage of tongue.
	Skull	<ul style="list-style-type: none"> • Describe the features of Norma Frontalis, Norma Verticalis, Norma Parietalis, Norma occipitalis and Norma Basalis • Describe the features of Norma lateralis: temporal, infratemporal & pterygopalatine fossae giving their boundaries, contents and communications. • Discuss the sutures and fontanelles of skull, their age changes and clinical significance.
	Scalp	<ul style="list-style-type: none"> • List the layers of scalp and describe the anatomical features with neurovascular supply and lymphatic drainage of scalp • Give anatomical justification of spread of scalp infections, profuse bleeding in superficial scalp lacerations, gaping of scalp wounds and black eye
	Muscles of facial expressions	<ul style="list-style-type: none"> • Enlist in tabulated manner the muscles of facial expression and mastication, giving their nerve supply and actions. • Define modiolus.
	Neurovascular supply of face	<ul style="list-style-type: none"> • Describe the functional modalities, course, branches, and distribution of cranial nerves innervating the face

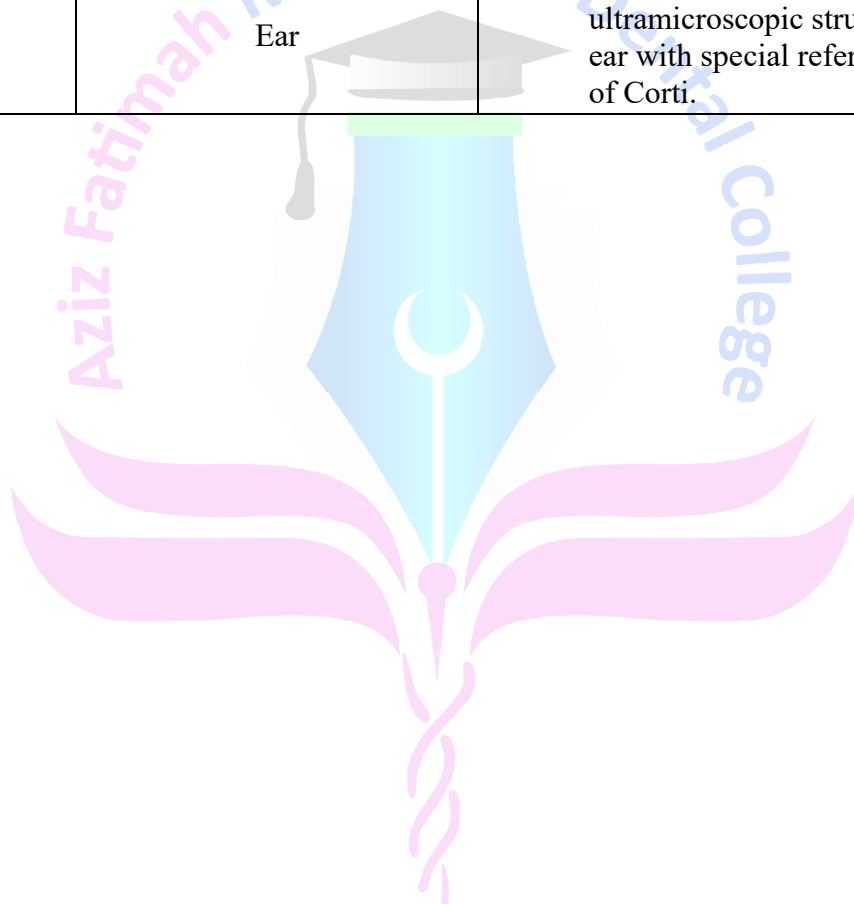
		<p>(sensory and motor): trigeminal and facial nerves</p> <ul style="list-style-type: none"> • Describe the vascular supply and lymphatic drainage of face. • Draw a diagram to illustrate cutaneous innervation of face. • Discuss anastomoses of facial artery with contralateral vessels and branches of internal carotid artery with their clinical significance
	The danger area of face	<ul style="list-style-type: none"> • Describe the danger area of face with its clinical significance. Define the routes of spread of infection from face and scalp to intracranially.
	Mandible.	<ul style="list-style-type: none"> • Describe the bony features and muscle attachment of mandible. • Classify temporomandibular joint mentioning its ligaments, relations, nerve supply and movements (with their mechanics and muscles producing them).
	Parotid gland	<ul style="list-style-type: none"> • Describe anatomical features, relations and neurovascular supply of parotid gland and its duct, mentioning the structures entering and exiting the gland • Discuss the clinical correlates of parotid gland: parotiditis, Mumps, Frey's syndrome, parotid duct stones and parotid tumor surgery with its complications
	Waldeyers' ring	<ul style="list-style-type: none"> • Describe the parts and boundaries of oral cavity and give its relation to the Waldeyers' ring.
	Hard and soft palate	<ul style="list-style-type: none"> • Describe the anatomical features of hard and soft palate with their neurovascular supply.
	Submandibular and Sublingual glands	<ul style="list-style-type: none"> • Describe anatomical features, relations and neurovascular supply of submandibular and sublingual glands with their ducts.
	Otic and Submandibular ganglia	<ul style="list-style-type: none"> • Describe the location, roots and distribution of otic and submandibular ganglia

	Hyoid bone	<ul style="list-style-type: none"> Describe the anatomical features of Hyoid bone and give attachments on the bone.
	Cervical vertebrae	<ul style="list-style-type: none"> Enumerate the types of cervical vertebrae and list the differences between them. Describe the anatomical features and attachments on cervical vertebrae. Classify the joints of cervical vertebrae mentioning their ligaments, movements with muscle producing them and neurovascular supply
	Prevertebral muscles	<ul style="list-style-type: none"> List the prevertebral muscles of cervical region. Describe their attachments, actions and innervation.
	Deep cervical fascia	<ul style="list-style-type: none"> Enumerate parts of deep cervical fascia with their respective extents, attachments, relations and contents.
	Facial spaces	<ul style="list-style-type: none"> Describe the facial spaces in head and neck mentioning their communications and their relation to spread of infection.
	Infrahyoid and suprahyoid muscles	<ul style="list-style-type: none"> Describe the attachments, actions and nerve supply of infrahyoid and suprahyoid muscles of neck.
	Ansa cervicalis.	<ul style="list-style-type: none"> Describe the location, formation and distribution of ansa cervicalis.
	Sternocleidoma stoid and trapezius	<ul style="list-style-type: none"> Describe the attachments, actions and nerve supply of sternocleidomastoid and trapezius
	Triangles of neck	<ul style="list-style-type: none"> Describe the boundaries and contents of suboccipital, anterior and posterior triangles of neck
	Trachea and esophagus	<ul style="list-style-type: none"> Describe the cervical part of trachea and esophagus with their neurovascular supply.
	Thyroid, Parathyroid glands	<ul style="list-style-type: none"> Describe the location, anatomical features and vascular supply of thyroid and parathyroid glands. List the variations in location of parathyroid glands

	Carotid arteries	<ul style="list-style-type: none"> Describe the carotid arteries mentioning their origin, course, branches, distribution and termination.
	Carotid body	<ul style="list-style-type: none"> Describe carotid body and carotid sinus and give their clinical significance.
	Head & Neck venous drainage	<ul style="list-style-type: none"> Give the venous drainage of Head and Neck region. Describe the formation, tributaries and area of drainage of vessels constituting jugular venous system.
	Lymphatics of head and neck	<ul style="list-style-type: none"> Name the superficial and deep cervical lymph nodes and give their location and drainage areas
	Cervical plexus	<ul style="list-style-type: none"> Describe the location, formation, branches, distribution and lesions of cervical plexus
	Pharynx	<ul style="list-style-type: none"> Name the parts of pharynx giving their extent, anatomical features, structure and neurovascular supply. Name the pharyngeal constrictor muscles defining their attachments, innervation and structure traversing the gaps between adjacent muscles.
	Larynx	<ul style="list-style-type: none"> Name the parts of larynx giving their extent, anatomical features, musculoskeletal framework and neurovascular supply.
	Tonsils	<ul style="list-style-type: none"> Discuss the location, anatomical features, relations and vascular supply of tonsils: nasopharyngeal, palatine and lingual
Embryology & Post-Natal Development	Pharyngeal apparatus and pharyngeal arches	<ul style="list-style-type: none"> List the components of pharyngeal apparatus. Describe the development of pharyngeal arches, grooves, pouches and membrane and give derivatives and fate of each of them.

	Auditory tube, tympanic cavity, tonsils, thymus and parathyroid	<ul style="list-style-type: none"> Describe the development and histogenesis of auditory tube, tympanic cavity, tonsils, thymus and parathyroid
	Congenital anomalies of pharyngeal arches	<ul style="list-style-type: none"> Discuss the embryological basis of congenital anomalies related to the development of pharyngeal arches, pharyngeal clefts and pharyngeal pouches: cervical sinus/fistula/cyst, 1st arch syndrome, DiGeorge syndrome, congenital malformations of thymus and parathyroid glands
	Face and nasolacrimal duct	<ul style="list-style-type: none"> Describe the development of face and nasolacrimal duct and their respective congenital anomalies
	Nose	<ul style="list-style-type: none"> Describe the development of nasal cavity and paranasal sinuses. Give the associated congenital anomalies
	Lips and palate	<ul style="list-style-type: none"> Describe the development of lip and palate and their associated congenital malformations. Explain the types and embryologic basis of cleft lip and cleft palate
	Eye & ear	<ul style="list-style-type: none"> Describe the development of optic vesicle and retina. Describe the development of cornea, sclera, choroid, iris, ciliary body and lens and relate it to their respective congenital anomalies. Describe the development of internal ear and give the embryological basis of associated congenital anomalies.
Microscopic Structure Histology	Tongue	<ul style="list-style-type: none"> Describe the light and electron microscopic structure of tongue mentioning the histological structure of lingual papillae and taste buds.
	Glands	<ul style="list-style-type: none"> Describe the histological structure of parotid, submandibular and sublingual glands. Compare and contrast the histological structures of parotid, submandibular and sublingual glands

	Head & Neck	<ul style="list-style-type: none"> • Differentiate between serous and mucous acini. • Describe the structure and location of serous demilunes. • Describe the serous and mucous acini and give histological differences between the two
	Eye	<ul style="list-style-type: none"> • Describe the histological structure of layers of eyeball, eyelid and retina. • Describe the light and electron microscopic structure of cornea.
	Ear	<ul style="list-style-type: none"> • Describe the histological and ultramicroscopic structure of internal ear with special reference to Organ of Corti.



➤ **Physiology**

Topic	Sub Topic	Learning objectives
Medical Physiology	Visual Acuity	<ul style="list-style-type: none"> • Define and describe the visual acuity • Define Emmetropia • Enlist the errors of refraction • Explain the cause, features, physiological basis, and correction of Hyperopia • Explain the cause, features, physiological basis, and correction of myopia • Explain the cause, features, physiological basis, and correction of astigmatism • Describe the pathophysiology and treatment of cataract
	Refractive Errors	<ul style="list-style-type: none"> • Interpret common treatment modalities for Refractive errors
	Fluid systems of the Eye	<ul style="list-style-type: none"> • Describe the mechanism of formation and outflow of aqueous humor • Describe normal value of intraocular pressure and its regulation • Describe the method for measuring the intraocular pressure • Describe the causes and features and pathophysiology of glaucoma
	Glaucoma	<ul style="list-style-type: none"> • Discuss the clinical features of Open Angle and Angle Closure Glaucoma
	Retina	<ul style="list-style-type: none"> • Describe the physiological anatomy and function of structural elements of retina • Enlist different layers of retina • Explain the significance of melanin pigment in retina. • Describe macula and foveal region of retina and their significance • Describe the structure of rods and cones • Comment on the location of optic disc and its significance

		<ul style="list-style-type: none"> Describe the cause, features, and treatment of retinal detachment Enlist the current investigations for Retinal Diseases
	Photochemistry of vision	<ul style="list-style-type: none"> Describe the rhodopsin-retinal visual cycle Describe the mechanism of excitation of rods/ rods receptor potential Describe the causes and treatment of night blindness
	Adaptation	<ul style="list-style-type: none"> Define and describe different mechanisms of light adaptation Define and describe different mechanisms of dark adaptation Enumerate the diseases leading to Night Blindness and retinal detachment
	Color vision	<ul style="list-style-type: none"> Explain the tri color mechanism of color determination Define term protanopes, deuteranopes, tritanopes Enlist the types of color blindness and their causes Enlist clinical features of Color vision deficiencies
	Visual Pathways	<ul style="list-style-type: none"> Trace the visual pathway Enlist and describe the abnormalities of visual pathway & visual field Explain the effect of removal of primary visual cortex
	Field of vision	<ul style="list-style-type: none"> Define the physiological blind spot and describe its location Define scotoma/ pathological blind spot and enlist causes
	Visual fields	<ul style="list-style-type: none"> Illustrate the abnormalities of field of vision
	Eye movements	<ul style="list-style-type: none"> Describe the muscular and neural control of eye movements

	Strabismus	<ul style="list-style-type: none"> Define and enlist the types of Strabismus
	Accommodation	<ul style="list-style-type: none"> Explain the mechanism of accommodation Enlist the components of near response in accommodation Describe the neural pathway for accommodation reflex Describe the regulation of accommodation Enlist the clinical features of Presbyopia
	Pupillary light reflex	<ul style="list-style-type: none"> Trace the neural pathway for pupillary light reflex Explain the pupillary light reflexes or reactions in CNS diseases Describe the cause and features of Horner syndrome Illustrate the differential diagnosis of Anisocoria
	Sense of hearing	<ul style="list-style-type: none"> Describe the physiological anatomy of outer and middle ear Enlist the functions of middle ear Discuss clinical features and treatment of impacted wax Define causes and clinical features of Otomycosis Describe the mechanism of impedance matching and its significance Describe the mechanism of attenuation reflex and its significance
	Inner Ear/ Cochlea	<ul style="list-style-type: none"> Describe the physiological anatomy of inner ear. Describe the mechanism of transmission of sound waves in cochlea
	Organ of Corti	<ul style="list-style-type: none"> Describe the physiological anatomy and function of organ of Corti Describe the mechanism of generation of endocochlear potential and its significance
	Determination of sound frequency	<ul style="list-style-type: none"> Write down the normal range of frequency for hearing. Describe the role of place principle in

		<p>determination of sound frequency</p> <ul style="list-style-type: none"> Describe the role of volleys principle in determination of sound frequency
	Determination of Loudness	<ul style="list-style-type: none"> Discuss determination of loudness of sound
	Auditory pathway	<ul style="list-style-type: none"> Trace the normal auditory nervous pathway Describe the types of deafness Discuss the clinical features and investigations of Congenital and Acquired hearing loss
	Sense of Taste	<ul style="list-style-type: none"> Enlist the primary taste sensations Define and explain the term taste blindness Describe the physiological anatomy and location of taste buds
	Excitation of Taste buds	<ul style="list-style-type: none"> Describe the mechanism of stimulation of taste buds/ receptor potential Trace the pathway of taste sensation
	Abnormalities of Taste sensations	<ul style="list-style-type: none"> Define and explain the terms: Ageusia, Hypergeusia, Hypogeusia and dysgeusia Describe the senile changes in taste buds
	Taste preference and aversion	<ul style="list-style-type: none"> Explain the terms: Taste preference and taste aversion
	Sense of smell	<ul style="list-style-type: none"> Enlist the primary sensations of smell Describe the physiological anatomy and location of olfactory membrane
	Rhinitis	<ul style="list-style-type: none"> Enlist the causes and clinical features of Rhinitis Differentiate between viral and allergic Rhinitis

➤ **Medical Biochemistry**

Topic	Sub Topic	Learning objectives
Medical Biochemistry	Metabolism of mono and disaccharides	<ul style="list-style-type: none"> • Discuss the metabolism of mono and disaccharides • Interpret Hereditary fructose intolerance, fructosuria, galactosemia and lactose intolerance, in relevance to the clinical findings • Explain the Polyol pathway and effect of hyperglycemia on sorbitol pathway • Discuss the sources, metabolically active forms, biochemical role and clinical correlation of Vit-A with vision

➤ **Pathophysiology and Pharmacotherapeutics**

Topic	Sub Topic	Learning objectives
Pathology	Eye/Ear infection	<ul style="list-style-type: none"> • Enlist the common causative agents of Eye, Ear infections • Discuss the pathogenesis and clinical features of common pathogens

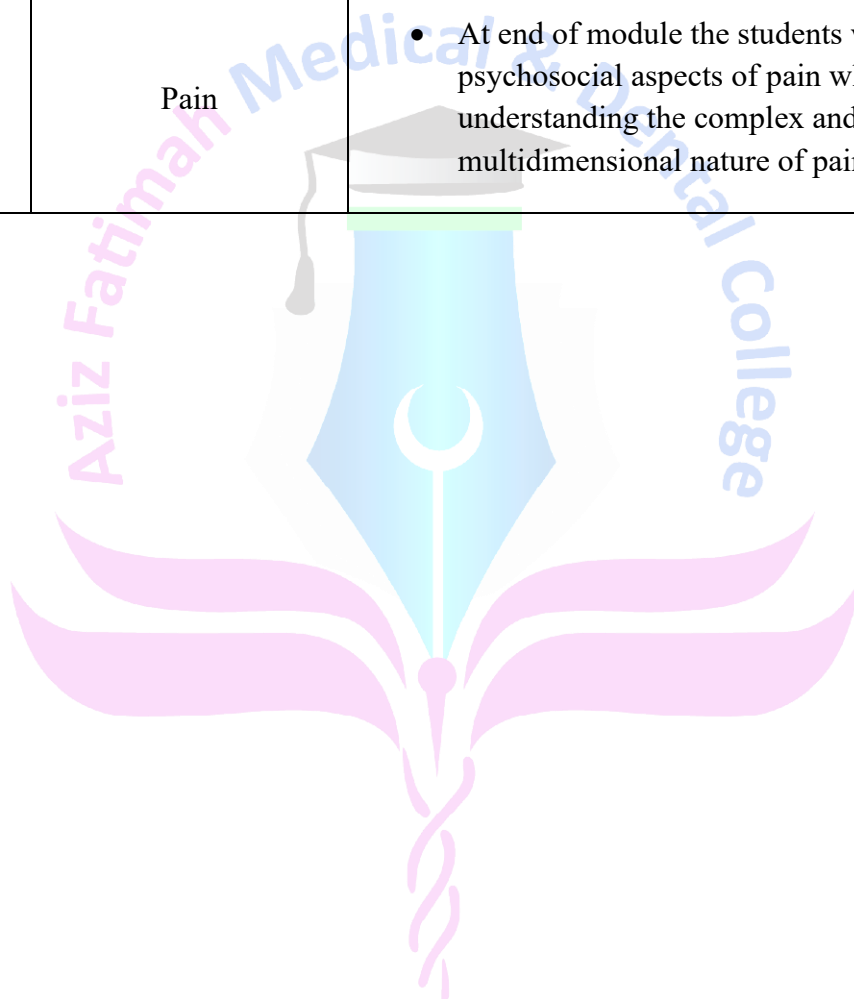
➤ **Aging**

Topic	Sub Topic	Learning objectives
Aging	Deafness	<ul style="list-style-type: none"> • Familiarize with the age-related hearing loss
	Head & Neck	<ul style="list-style-type: none"> • Discuss the age changes of mandible

➤ **Disease Prevention & impact**

Topic	Sub Topic	Learning objectives
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Community Medicine and Public Health	Hearing Lose	<ul style="list-style-type: none">• Identify factors leading to noise pollution
	Blindness	<ul style="list-style-type: none">• Describe the common causes of blindness in community• Describe risk factors and preventive strategies for blindness at community level
Behavioral Sciences	Pain	<ul style="list-style-type: none">• At end of module the students will learn the psychosocial aspects of pain which will help in understanding the complex and multidimensional nature of pain.

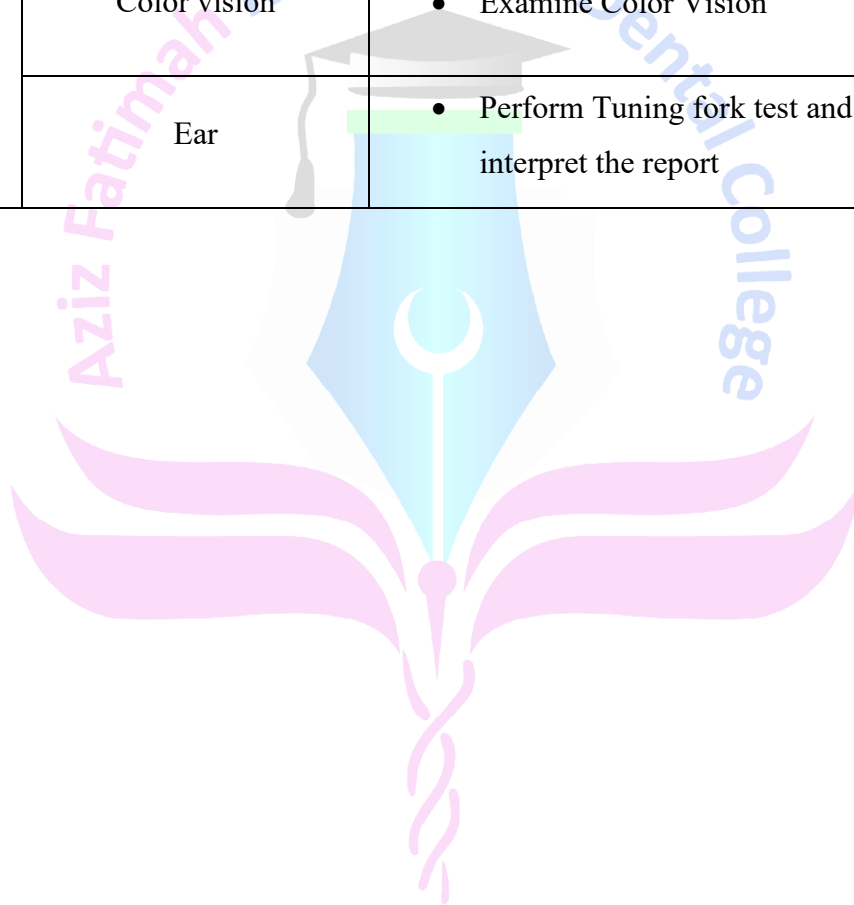


6.3.2. Skills

➤ Practical's

Topic	Sub Topic	Learning objectives
Histology	Tongue	<ul style="list-style-type: none"> Identify, draw and label diagrams to show histological structure of tongue, lingual papillae and taste buds.
	Head & Neck	<ul style="list-style-type: none"> Draw and label diagrams to show histological structure of serous demilunes, serous and mucous acini.
	Eye	<ul style="list-style-type: none"> Draw and label diagrams to show histological structure of eyelid and cornea. Draw and label a diagram to show histological structure of retina. List its histological layers and their respective components
	Ear	<ul style="list-style-type: none"> Draw and label a diagram to show histological structure of internal ear.
Biochemistry	Interpretation of results	<ul style="list-style-type: none"> Interpretation of insulin and C peptide
	HbA1C	<ul style="list-style-type: none"> Perform HbA1C
	Abnormal constituents in urine	<ul style="list-style-type: none"> Detect abnormal constituents in urine by chemical methods
Physiology	Cranial Nerves	<ul style="list-style-type: none"> Examine the Second, Third, Fourth & Sixth Cranial Nerves
	Light reflex	<ul style="list-style-type: none"> Examination of Light Reflex

	Vision	<ul style="list-style-type: none">• Determine the Visual Acuity for Far and Near vision
	Ophthalmoscopy	<ul style="list-style-type: none">• Perform Ophthalmoscopy
	Visual field	<ul style="list-style-type: none">• Examine Field of Vision and interpretation of visual field plotted
	Color vision	<ul style="list-style-type: none">• Examine Color Vision
	Ear	<ul style="list-style-type: none">• Perform Tuning fork test and audiometry, interpret the report



6.3.3. C-FRC for Head and Neck, Special Senses Module

HEAD AND NECK, SPECIAL SENSES MODULE		
Objectives	Skill	Miller's Pyramid Level Reflected
Examination of the nose	Nasal examination	Shows
Examination of neck lumps	Neck lump examination	Shows



7. Attitude

➤ PERL's for Block-V

ENDOCRINOLOGY & REPRODUCTION-I				
*Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				Total Hours = 09
Code	Domain	Topic	Specific Learning Objectives	Proposed Portfolio Entry
	Professionalism	Task Management & Productivity	<ul style="list-style-type: none"> Discuss the principles of effective task management and productivity, focusing on setting priorities, managing workloads, and maintaining efficiency in both academic and clinical settings. Create a task list for an academic week, prioritizing tasks based on deadlines and importance, and reflecting on strategies to enhance productivity and efficiency. 	Submit a weekly task management plan, detailing how you organized and prioritized your tasks to maximize productivity. Reflect on how this approach helped improve your efficiency and ability to meet academic or clinical deadlines.
	Research	Literature Search Strategy	<ul style="list-style-type: none"> Discuss the principles of developing a literature search strategy, including identifying relevant databases, using appropriate keywords, and refining search criteria to gather evidence for research purposes. Design and implement a literature search strategy for a given medical topic, selecting appropriate databases and refining search terms to find relevant articles. 	Submit a summary of your literature search strategy, including the databases used, search terms, and filters applied. Reflect on how you refined your search to gather the most relevant and high-quality articles for your research.
	Research	Literature Summary	<ul style="list-style-type: none"> Discuss steps for summarizing research findings and effectively organizing literature 	Submit a completed literature matrix that includes a summary of key studies related

			<p>using a literature matrix, enabling better comparison and synthesis of information across studies.</p> <ul style="list-style-type: none"> • Create a literature matrix for a selected topic, summarizing key findings, methodologies, and conclusions from relevant articles to facilitate analysis and comparison. 	<p>to your chosen topic. Include columns for author, year, study design, findings, and relevance.</p>
	Leadership	Taking Evidence based Informed Consent	<ul style="list-style-type: none"> • Discuss principles of taking informed consent in a manner that incorporates evidence-based information, ensuring patients are fully informed about their treatment options, risks, and benefits. • Practice taking informed consent from a simulated patient, using evidence-based information to explain the procedure, risks, benefits, and alternatives, ensuring the patient's understanding and comfort 	<p>Submit a reflection on a simulated informed consent session. Discuss how you communicated evidence-based information to the patient, how you ensured their understanding, and the importance of respecting their autonomy in the decision-making process</p>
	Professionalism	Respect Diversity for	<ul style="list-style-type: none"> • Appreciate the importance of respecting diversity in healthcare, including sensitivity and responsiveness to patients' culture, age, gender, and disabilities, while applying principles of inclusion and equity. 	<p>Create a simple poster or a one-page reflection outlining key strategies for respecting diversity in patient care. Include examples of how to communicate effectively with patients from different backgrounds and</p>

				ensure that care is inclusive and equitable.
	Leadership	Conflict Resolution	<ul style="list-style-type: none"> Discuss the principles and strategies of effective conflict resolution focusing on communication, negotiation, and collaboration to achieve positive outcomes. Participate in a role-playing exercise to navigate a conflict scenario, practicing conflict resolution techniques such as active listening, empathy, and problem-solving. 	Submit a reflection on the conflict resolution exercise. Discuss the strategies you used, how effective communication played a role, and what you learned about resolving conflicts in a healthcare environment.

HEAD AND NECK & SPECIAL SENSES

**Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block*

Total Hours = 06

Code	Domain	Topic	Specific Learning Objectives	Proposed Portfolio Entry
	Research	Literature Reviews	<ul style="list-style-type: none"> Discuss the purpose and methodology of conducting a literature review, including how to synthesize existing research, identify gaps in the literature, and establish a framework for future research. Conduct a literature review on a specific medical topic, summarizing key findings, identifying trends, and highlighting gaps in current research. 	Submit a poster showing steps in conducting literature review.

			<p>work-life balance, focusing on strategies for managing personal well-being while fulfilling professional commitments to ensure optimal mental and physical health.</p> <ul style="list-style-type: none"> • Create a personal plan that outlines strategies for achieving work-life balance, including time management, self-care practices, and setting boundaries between personal and professional life 	<p>specific strategies you intend to implement to manage stress and maintain your well-being while meeting your academic and professional responsibilities.</p>
	Professionalism	Digital representation	<ul style="list-style-type: none"> • Discuss principles of digital representation in a professional context, focusing on how to effectively present an e-portfolio, wiki page, or blog page that reflects one's skills, experiences, and professional identity. • Create and present a digital representation of their professional achievements, utilizing platforms such as e-portfolios, wiki pages, or blogs to showcase their skills, projects, and reflections. 	<p>Submit a link to your e-portfolio, wiki page, or blog page along with a brief reflection on the choices you made in its design and content. Discuss how this digital representation aligns with your professional goals and identity.</p>
	Ethics	Patient autonomy in sensory disabilities	<ul style="list-style-type: none"> • Discuss the ethical principles surrounding patient autonomy, particularly in the context of individuals with sensory disabilities, focusing on their right to make informed decisions about their healthcare. • Analyze a case study involving a patient with 	<p>Create a presentation or infographic that highlights key strategies for supporting patient autonomy in individuals with sensory disabilities. Include information on effective</p>



ASSESSMENT POLICY AND TOS OF UHS

8. Teaching & Learning Methodologies

➤ **Interactive Lectures**

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 group discussions**

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 Skills Session**

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

➤ **Case based Learning**

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 reasonable conclusion.

➤ **Problem Based Learning**

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-directed learning**

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 their learning

9. Assessment Methodologies

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.

10. 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 second year.
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 modular blocks.
3. There will be three papers in the first professional examination, and four papers in the second professional examination

First Professional Exam:

- a) Paper 1 will be based on contents of Block 1;
- b) Paper 2 will be based on contents of Block 2;
- c) Paper 3 will be based on contents of Block 3;

Second Professional Exam:

- a) Paper 1 will be based on contents of Block 4;
 - b) Paper 2 will be based on contents of Block 5;
 - c) Paper 3 will be based on contents of Block 6;
 - d) Paper 4 will be based on contents of Islamic Studies/Civics and Pakistan Studies;
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 175 marks each, making the total marks of 350 for each paper of papers 1, 2 and 3 (inclusive of internal Assessment).
 6. Total marks for the First and Second Professional Examinations shall be 1050, 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 candidates failing in the subject of Islamic Studies/Civics & Pakistan Studies, while passing other subjects of 2nd professional examination, may not

be subjected to detention, as the subject has no contribution towards total marks of any professional examination, and determination of position or merit. The students may rather be allowed to pass the examination in the subject, before appearing in their final professional MBBS examination, and in case of their failure to clear the subject they may not be allowed to take their final professional MBBS examination

7. Major content areas of the first two professional years shall be from:
 - a. Anatomy including applied/clinical/Anatomy
 - b. Physiology including applied/clinical/Physiology
 - c. Biochemistry including applied/clinical/ Biochemistry
8. The Applied/Clinical content for the Anatomy, Physiology and Biochemistry shall be based on clinical correlations.
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. Written Examination

- 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 65:35 %.
- e. Each MCQ will have five options (one best response and four distractors) and will carry one (01) mark.
- f. There will be no negative marking.
- g. There will be no sections within an SEQ, and it will be a structures question with five (05) marks each.
- h. SEQ's will only be based on the major content areas of the year.
- 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 195 minutes (03 hours & 15 minutes).
- k. The MCQ section will be 95 minutes duration and the SEQ section 100 minutes.

11. Oral/Practical/Clinical Examination

- a. The Oral/Practical/Clinical examination of each Papers 1, 2, and 3 will consist of a total of twelve (18) OSPE/OSCE/OSVE stations in each Oral/Practical/Clinical examination.
 - b. There will be seven (11) 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 applied knowledge.
 - c. There will be two (02) Observed OSCE (Objective Structured Clinical Examination) stations, 01 from C-FRC1 and PERLs-1 in each Oral/Practical/Clinical examination.
 - 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 clinical application.
 - e. Each OSPE station will carry eight (08) marks.
 - f. Each OSCE from C-FRC-1 and PERLs-1 will carry eight (05) marks.
 - g. Each OSVE station will carry 14 marks
 - h. The duration of each Oral/Practical/Clinical examination will be 100 minutes.
 - i. Time for each OSPE, OSCE and OSVE station will be eight (06) minutes.
12. Every candidate shall take the examination in the following Blocks (Modules) in First & Second Professional MBBS Examination:

Year 1

- | | |
|---|-----|
| i. Block 1 (Foundation-I + Hematopoietic & Lymphatic) Marks | 350 |
| ii. Block 2 (Musculoskeletal & Locomotion-1) Marks | 350 |
| iii. Block 3 (Cardiovascular-1 Respiratory-1) Marks | 350 |

Year 2

- | | |
|---|-----|
| a. Block 4 (Gastrointestinal Tract & Nutrition- Renal-1) Marks | 350 |
| b. Block 5 (Endocrinology & Reproduction Head & Neck, Special Senses) Marks | 350 |
| c. Block 6 (Neurosciences-1+ Inflammation) Marks | 350 |

d. Islamic Studies Civics Pakistan Studies Marks

100

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

The examination in Block 4 shall be as follows

- I. One written paper of 140 marks having two parts
 - a. Part I shall have ninety (90) Multiple Choice Questions (MCQs) of total 90 marks (01 mark for each MCQ) and the time allotted shall be 95 minutes. There will be no negative marking.
 - b. Part II shall have ten Structured Essay Questions (SEQs) of total 50 marks (05 marks for each SEQ) and the time allotted shall be 100 minutes.
- II. Oral Practical/Clinical examination shall have 140 marks in total.
- III. The continuous internal assessment through Block Examination conducted by the college of enrollment shall carry 70 marks, e 20% of the total allocated marks (350) for the block The score will be equality distributed to the Written and Oral/Practical Clinical Examinations

B. Block 5 (Endocrinology & Reproduction-1 + Head & Neck, Special Senses)

The examination in Block 5 shall be as follows

- IV. One written paper of 140 marks having two parts
 - c. Part I shall have ninety (90) Multiple Choice Questions (MCQs) of total 90 marks (01 mark for each MCQ) and the time allotted shall be 95 minutes. There will be no negative marking.
 - d. Part II shall have ten Structured Essay Questions (SEQs) of total 50 marks (05 marks for each SEQ) and the time allotted shall be 100 minutes.
- V. Oral Practical/Clinical examination shall have 140 marks in total.
- VI. The continuous internal assessment through Block Examination conducted by the college of enrollment shall carry 70 marks, e 20% of the total allocated marks (350) for the block The score will be equality distributed to the Written and Oral/Practical Clinical Examinations

C. Block 6 (Neurosciences-1 + Inflammation)

The examination in Block 6 shall be as follows

- VII. One written paper of 140 marks having two parts

- e. Part I shall have ninety (90) Multiple Choice Questions (MCQs) of total 90 marks (01 mark for each MCQ) and the time allotted shall be 95 minutes. There will be no negative marking.
- f. Part II shall have ten Structured Essay Questions (SEQs) of total 50 marks (05 marks for each SEQ) and the time allotted shall be 100 minutes.
- VIII. Oral Practical/Clinical examination shall have 140 marks in total.
- IX. The continuous internal assessment through Block Examination conducted by the college of enrollment shall carry 70 marks, e 20% of the total allocated marks (350) for the block The score will be equality distributed to the Written and Oral/Practical Clinical Examinations

D. Islamic Studies/Civics and Pakistan Studies

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 Studies having two components:
- 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.
 - 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 marks each.

YEAR-2						
Block 4 Modules (GIT & Nutrition-I + Renal-I)	Part I MCQs (90)	90 Marks	Practical /Clinical Examination	11 OSPE	Marks 88	350
	Part II SEQs (10)	50 Marks		02 OSCE	10	
	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	175	Total	175		
Block 5 Modules (Endocrinology & Reproduction-I +	Part I MCQs (90)	90Marks	Practical /Clinical Examination	11 OSPE	Marks 88	350
	Part II SEQs (10)	50Marks		02 OSCE	10	
				03 OSVE	42	

Head& Neck, Special Senses)	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks	
	Total	175	Total	175	
Block 6 Modules (Neurosciences-I + Inflammation)	Part I MCQs (90)	90 Marks	Practical /Clinical Examination	11 OSPE 02 OSCE 03 OSVE	Marks 88 10 42
	Part II SEQs (10)	50 Marks			
	Internal Assessment	35 Marks	Internal Assessment	35 Marks	
	Total	175	Total	175	
Total Marks:					1050
Islamic Studies/ Civics and Pakistan Studies	Islamic Studies/Civics 3 LEQs of 20 marks each		60 Marks		100*
	Pakistan Studies 2 LEQs of 20 marks each		40 Marks		
	Total		100		

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 MBBS Examination.

11. Exam Regulations by UHS

1. Professional examination shall be open to any student who:
 - 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 the examination.
 - 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 admission forms.
 - d. Produces the following certificates duly verified by the principal of his/ her college:
 - I. of good character;
 - II. of having attended not less than cumulative 85% of the full course of lectures delivered and practical conducted in the academic session, while maintaining 75 % attendance in each block,
 - III. Certificate of having appeared at the Block Examinations conducted by the college of enrolment with at least 55 % cumulative percentage in aggregate of blocks 1,2 and 3 for the 1st Year and 4,5, and 6 for the Second year;
 - IV. Candidates falling short of block/s attendance shall not be admitted to the annual examination unless they take remedial classes to complete the requirement
2. The minimum number of marks required to pass this examination for each paper shall be fifty percent (55%) in Written and fifty percent (55%) in the Oral/Practical/Clinical examinations and fifty percent (50%) in aggregate, independently and concomitantly at one and the same time.
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 whole at one and the same time.
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 MBBS Examination.

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 next class.
6. The colleges may arrange remedial classes and one re-sit for block examination after approval from the competent authority.
7. The remedial classes and re-sit examination can be conducted during summer vacation/weekends, before or during preparatory leave, for the concerned professional examination, subject to the following conditions:

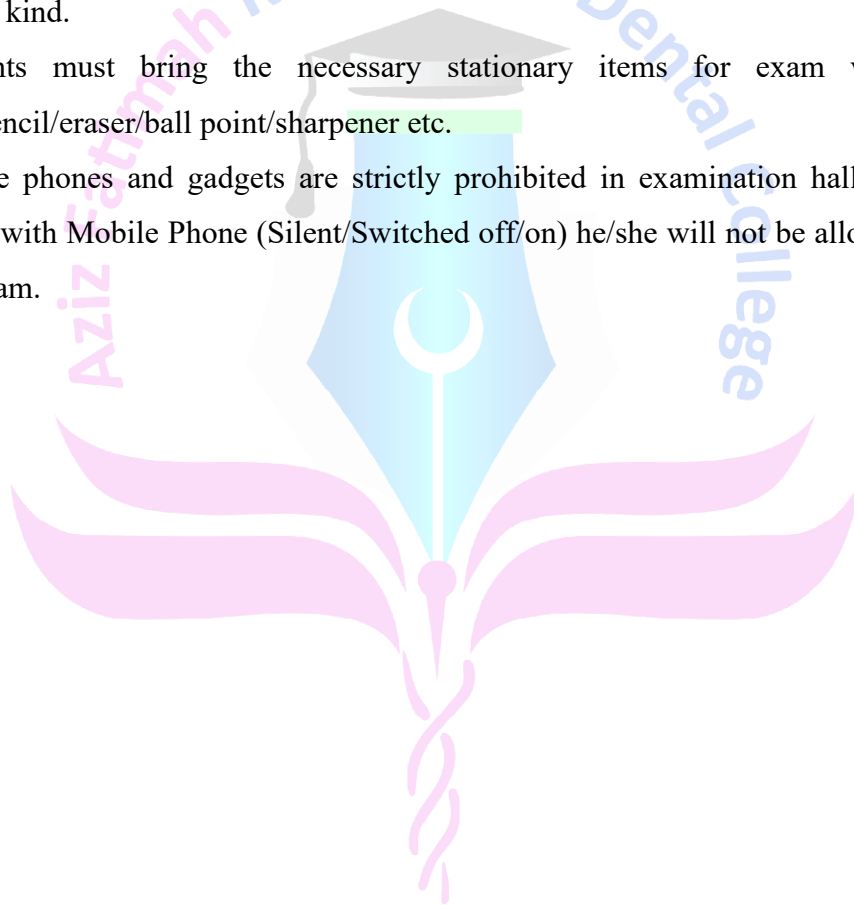
At the completion of each block, the principals of the colleges shall submit a detailed report to the university, including cases of students with short attendance poor performance/absence in the block examination along with the reasons and evidence for the same, proposed schedule to remedial classes and re-sit examination.

- I. 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
- II. 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 block 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 first instance
- III. 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 or disaster
However, in special circumstances a student can be allowed to attend the 'remedial classes' for a certain block, with the permission of the Competent Authority, to complete his/her requirement of attendance, even if the block attendance is less than 50%. In such cases, the evidence of reason will be provided by the college after the Principal has endorsed the case.
 - b. The students who have attained a cumulative attendance of 85% directly or with remedial classes, can appear in the 'annual' professional examination.
 - c. 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 sickness / death of an immediate relative/being afflicted by a natural/manmade calamity or disaster or detained students (missed the first block of the year) or UHS permitted late admission students

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 prescribed fee.
9. The marks of internal assessment and attendance shall be submitted to Controller of Examinations three times, within two weeks of completion of each block examination
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 the colleges after every block examination to share feedback on the progress of students with their parents, Minutes of parent teacher meetings shall be submitted to the Department of Medical Education UHS.
11. It 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 the colleges.
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 of Governors.

12. Examination Rules AFMDC

- Students must report to examination hall/ venue at least 30 minutes before the exam.
- Exam will start sharp at time.
- Late comers arriving at the examination hall more than 15 minutes after the start of the paper will not be allowed to enter the examination hall.
- All students should wear Lab coats before appearing in the exam.
- Students are not allowed to take into the examination hall textbooks, notes or manuscript of any kind.
- 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 the exam.



13. Table of Specification (TOS)

MBBS 2nd Professional

Block-5

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (5 marks each observed)	OSVE (14 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	30	04	50	04	-	01	46
	Physiology applied/clinical	20	04	40	03	-	01	38
Normal Function	Biochemistry applied/clinical	14	01	19	01	-	01	22
Disease Burden & Prevention	Community Medicine & Public Health	07	-	07	-	-	-	0
	Behavioral Sciences	04	-	04	-	-	-	0
Pathophysiology & pharmacotherapeutics	Pathology	13	01	18	2	-	-	16
	Pharmacology	02	-	02	1	-	-	08
CFRC	CF-2	-	-	-	-	01	-	05
PERLs	PERLs-2	-	-	-	-	01	-	05
Total		90	10x5=50	140	11 stations x 08 = 88	02 stations x 05 = 10	03 stations x 14=42	140

14. Frame work of Block-5 Module Timetable 2024-25



AZIZ FATIMAH MEDICAL & DENTAL COLLEGE FAISALABAD

TIME TABLE 2nd YEAR MBBS CLASS SESSION 2024-25 Framework GIT, Nutrition Modules (Block IV)

DAY	1	2	3	4	5	6
Monday	08:00 am - 08:45 am Dissection	08:45 am - 09:30 am Dissection	09:30 am - 10:30 am Physiology	10:30 am - 11:20 am Biochemistry	11:20 am - 12:10 pm Anatomy	12:10 pm - 13:00 pm Biochemistry
Tuesday		Dissection	Physiology	Anatomy	Biochemistry	Pathology
Wednesday		Dissection	Biochemistry	Practical/SGD A: Biochemistry B: Physiology C: Anatomy Islamiyat		
Thursday		Dissection	Physiology	Practical/SGD B: Biochemistry C: Physiology A: Anatomy BS		
Friday	08:00 am - 08:50 am Biochemistry	08:50 am - 09:40 am Anatomy	09:40 am - 10:20 am Physiology	10:20 am - 11:10 am Islamiyat	11:10 am - 1:00 pm Practical/SGD C: Biochemistry A: Physiology B: Anatomy	Jumamah Prayers
Saturday		Dissection	Physiology	Biochemistry	Anatomy	Community Medicine



RESOURCE BOOKS

15. Learning Resources

Anatomy	<ul style="list-style-type: none"> • Snell's Clinical Anatomy 10th ed. • Langman's Medical Embryology 12th ed • Medical Histology by Laiq Hussain Siddiqui 8th ed. • General Anatomy by Laiq Hussain Siddiqui 6th ed.
Physiology	<ul style="list-style-type: none"> • Guyton AC and Hall JE. Textbook of Medical Physiology, W.B. Saunders & Co. Philadelphia • Essentials of Medical Physiology by Mushtaq Ahmad
Biochemistry	<ul style="list-style-type: none"> • Harpers illustrated Biochemistry 32nd edition. Rodwell.V.W MCGrawHill publishers. • Lippincott illustrated Review 8th edition Kluwer.W. • Essentials of Medical Biochemistry vol 1&2 by Mushtaq Ahmed.
Community Medicine	<ul style="list-style-type: none"> • Parks TextBook of Preventive and Social Medicine, K. Park(Editor) • Public Health and Community Medicine Ilyas Ansari(Editors)
Pharmacology	<ul style="list-style-type: none"> • Basic and clinical Pharmacology by Katzung. McGraw-Hill • Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins
Pathology	<ul style="list-style-type: none"> • Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders. • Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and • Cotran, Pocket Companion to Pathologic basis of diseases. Saunder Harcourt. • Walter and Israel. General Pathology. • Churchill Livingstone.
Medicine	<ul style="list-style-type: none"> • Davidson's Principles and Practice of Medicine
Surgery	<ul style="list-style-type: none"> • Bailey & Love Short Practice of Surgery
Islamiyat	<ul style="list-style-type: none"> • Standard Islamiyat (compulsory) for B.A, B.Sc, MA, Msc, MBBS by Prof. M Sharif Islahi • Ilmi Islamiyat (compulsory) mfor B.A, B.sc & equilent.
Behavioral Sciences	<ul style="list-style-type: none"> • Handbook of Behaioural Sciences by Prof. Mowadat H. Rana, 3rd Edition. • Medical and Psychosocial Aspects of Chronic illness and Disability Sixth Edition Donna R. Falvo, PHD Beverley E. Holland, PHD RN.