LAHORE
MEDICAL & DENTAL
COLLEGE

BLOCK-5

SECOND YEAR MBBS

STUDY GUIDE 2025

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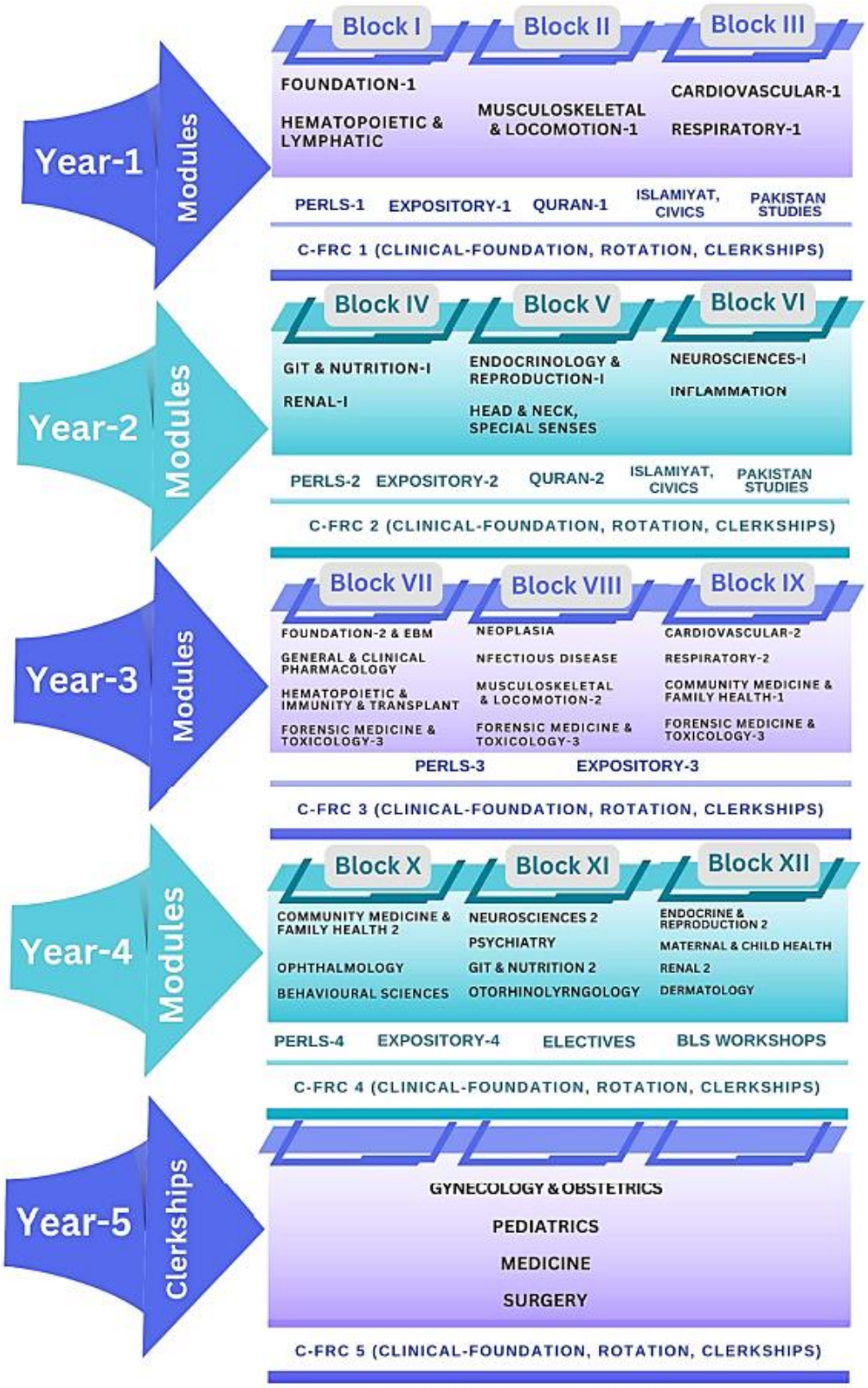
CURRICULUM FRAMEWOR



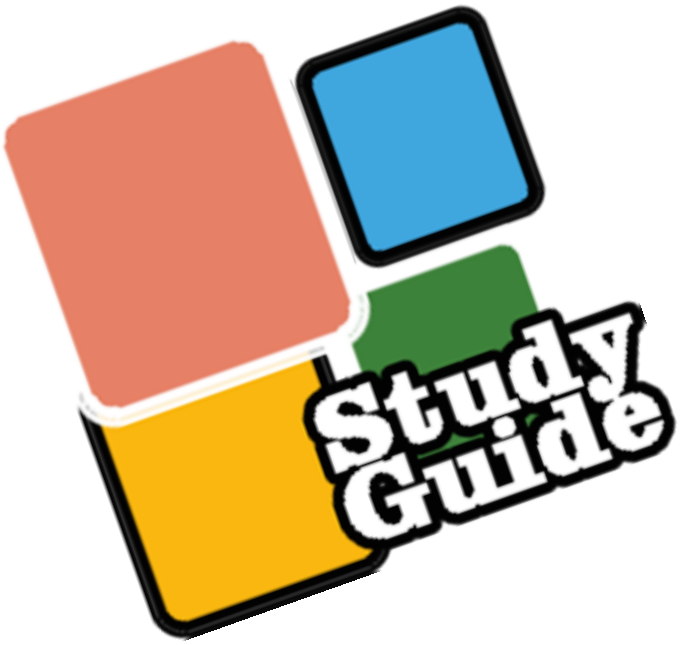
INTRODUCTION TO STUDY GUIDE

What is study guide?

The study guide is an important academic tool that aids students for different educational activities they are engaged in. It provides pertinent details on the module's structure, assisting students in planning their academic activities accordingly. Another purpose of study guide is to guide students about different rules and regulations as well as teaching and assessment techniques.

Purpose of study guide:

- Conveys details about the organization and management of the module.
- Helps the learners about departmental representatives who can be contacted in case of difficulty.
- Define the learning objectives that should be accomplished by the end of the module.
- Identifies learning methodologies such as lectures, small group discussion, practical that will be implemented during the module.
- Provide a list of learning resource to maximize their learning
- Includes information on the assessment methods and examination related rules and regulations



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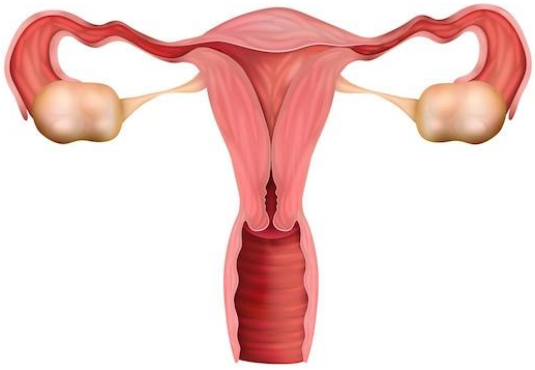
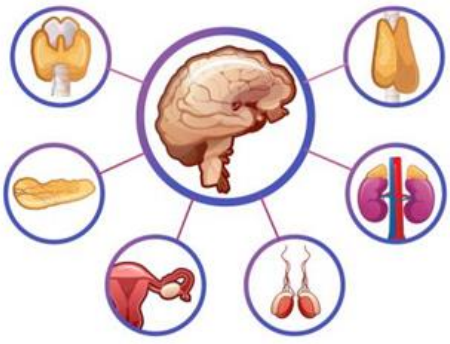
LAHORE
MEDICAL & DENTAL
COLLEGE

ENDOCRINOLOGY
& REPRODUCTION-1 MODULE

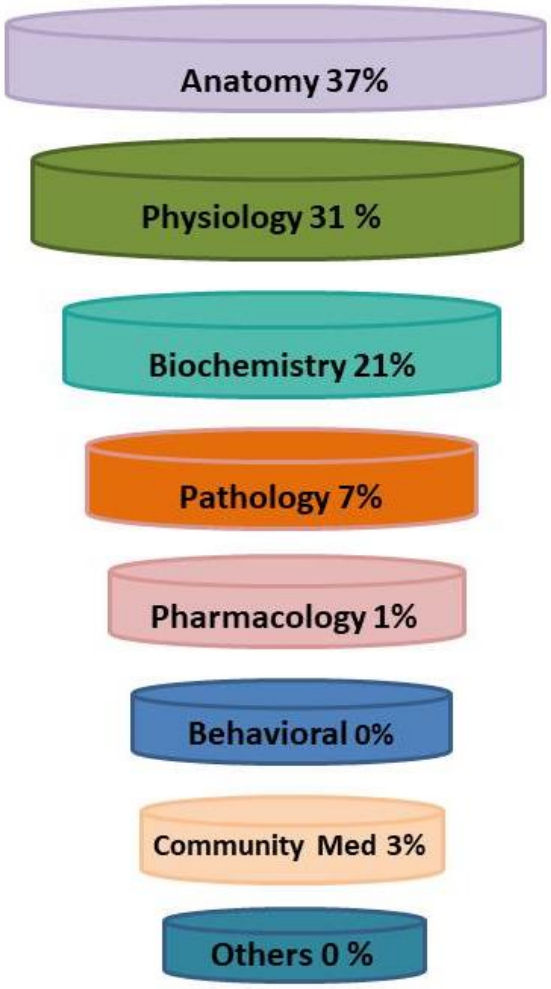




INTRODUCTION TO MODULE

Program	MBBS
Year	Two
Module No.	08
Module Title	Endocrinology & Reproduction-1 Module
Module weeks	07
Recommended minimum hours	197

Integrated Disciplines of Endocrinology & Reproduction module



MODULE DESCRIPTION

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.

MODULE OUTCOME

- 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.

THEMES

- Introduction to Endocrinology, Mechanism of action, Second messenger, measurements
- Pituitary gland
- Thyroid Gland & Parathyroid Gland
- Adrenal glands
- Pancreatic Hormones
- Reproduction & Genetics

CLINICAL RELEVANCE

- Diabetes
- Hypothyroidism & Hyperthyroidism
- Cushing Syndrome & Addison’s disease
- Dysfunctional Uterine Bleeding, Infertility

TIMETABLE

Lahore Medical & Dental College
Canal Bank North, Tulspura, Lahore
Phone No. 0346-4418891-98
No. LMDC/6203-26 /2025, Dated: 02-06-25

2nd YEAR M.B.B.S TIMETABLE SESSION 2023-2024 w.e.f. 09-06-2025

BLOCK – 5 (ENDOCRINOLOGY & REPRODUCTION – 1 MODULE)

DAYS & TIME	08:00 a.m. to 08:45 a.m.	08:45 a.m. to 09:30 a.m.	09:30 a.m. to 10:15 a.m.	10:15 a.m. to 11:00 a.m.	11:00 a.m. to 11:15 a.m.	11:15 a.m. to 12:15 p.m.	12:15 p.m. to 01:00 p.m.	01:00 p.m. to 03:00 p.m.	
MONDAY	Physiology Lecture Theater No. 10	Biochemistry Lecture Theater No. 10	Anatomy Lecture Theater No. 10	Biochemistry Lecture Theater No. 10		Anatomy Dissection Dissection Hall	*Pharma/Path Lecture Theater No. 2	**Histo Pract/ Physio Pract (A+B+C+D) ***Biochem Pract/ CFRC (E+F+G) Physiology tutorial (H+I+J)	
TUESDAY	Physiology Lecture Theater No. 10	Biochemistry Lecture Theater No. 10	Anatomy Lecture Theater No. 10	Biochemistry Lecture Theater No. 10	Break	Anatomy Dissection Dissection Hall	SDL Lecture Theater No. 2	**Histo Pract/ Physio Pract (H+I+J) ***Biochem Pract/ CFRC (A+B+C+D) Physiology tutorial (E+F+G)	
WEDNESDAY	Biochemistry Lecture Theater No. 10	Physiology Lecture Theater No. 10	Anatomy Lecture Theater No. 10	Physiology Lecture Theater No. 10		Anatomy Dissection Dissection Hall	Pathology Lecture Theater No. 2	**Histo Pract/ Physio Pract (E+F+G) ***Biochem Pract/ CFRC (H+I+J) Physiology tutorial (A+B+C+D	
THURSDAY	08:00 a.m. to 08:50 a.m.	08:50 a.m. to 09:40 a.m.	09:40 a.m. to 10:30 a.m.	10:30 a.m. to 11:20 a.m.	11:20 a.m. to 11:30 a.m.	11:30 a.m. to 12:30 p.m.	12:30 p.m. to 01:20 p.m.	01:20 p.m. to 02:10 p.m.	02:10 p.m. to 03:00 p.m.
	Anatomy Lecture Theater No. 10	Physiology Lecture Theater No. 10	Biochemistry Lecture Theater No. 10	Physiology Lecture theatre No. 2	Break	Anatomy Dissection Dissection Hall	Physiology Lecture Theatre No. 2	**** Disease Prev & Impact Lecture Theatre No. 2	Islamiyat/Pak Studies Lecture Theatre No. 2
FRIDAY	08:00 a.m. to 08:45 a.m.	08:45 a.m. to 09:30 a.m.	09:30 a.m. to 10:30 a.m.	10:30 a.m. to 10:45 a.m.	10:45 a.m. to 11:30 a.m.		11:30 a.m. to 12:15 p.m.	12:15 p.m. to 01:00 p.m.	
	Biochemistry Lecture Theater No. 10	Anatomy Lecture Theater No. 10	Anatomy Dissection Dissection Hall	Break	Physiology Lecture Theater No. 2		Physiology Lecture Theater No. 2	*****PERL / Aging / Biochem Lecture Theater No. 2	

CC:-
1. Principal, LMDC
2. Vice Principal, LMDC
3. Heads of All concerned Departments, LMDC/GTTH
4. HOD Medical Education, LMDC
5. Chief Administrative Officer / Director F&A, LMDC
6. Director Skills Lab, LMDC
7. Director IT, LMDC
8. Medical Superintendent, GTTH
9. Chairperson Timetable Committee, LMDC
10. Transport Incharge, LMDC
11. Manager Audio Video (Lecture Theatre Incharge), LMDC
12. Warden / Assistant Warden Hostels (Boy/Girl)
13. Security Supervisor, LMDC
14. Class Representative (Boy/Girl)
15. M/s Ali Tours, LMDC
16. Notice Board

* 1st three weeks Pharmacology & last four weeks Pathology.
** 1st six weeks Histology Practical & last week Physiology Practical.
*** 1st four weeks Biochemistry Practical & last three weeks CFRC.
**** 1st six weeks Community Medicine & last week Behavioral Sciences.
***** 1st four weeks PERL, next two weeks Aging & last week Biochemistry.

- *Clinical Foundation Rotation Clerkship (CFRC) will be held in Skill Lab/ WARD. In ward time of CFRC, students should be relieved 15 min before time to travel back to LMDC.*
- SDL lecture will be managed by Anatomy/Physiology/Biochemistry
- SDL for 1-hour practical time.
- Expository writing will be managed by Anatomy/Physiology/Biochemistry.

MAJ. GEN. (R) PROF. DR. NAEEM NAQI
PRINCIPAL

SUBJECT WISE TIME ALLOCATION

Subject	Time allocated (Hours)	Discipline
Anatomy (74 hours)		**Anatomy**
Gross Anatomy	**35**	
Embryology & post-natal development	**14**	
Microscopic structure	**14**	
Histology Practical	**11**	
Medical Physiology (61 hours)		**Physiology**
Theory	**59**	
Practical	**2**	
Medical Biochemistry (41 hours)		**Biochemistry**
Theory	**35**	
Practical	**6**	
Pathophysiology & Pharmacotherapeutics (14 hours)		
Theory	**2**	**Pharmacology**
	12	**Pathology**
Disease prevention & impact (6 hours)		
Theory	**5**	**Community medicine & public health**
	1	**Behavioral sciences**
Aging (1 total hour)	**1**	**Gynae/OBS**

LEARNING OBJECTIVES

NORMAL STRUCTURE			
THEORY			
	GROSS ANATOMY	**TOTAL HOURS = 35**	
CODE	**SPECIFIC LEARNING OUTCOMES**	**DISCIPLINE**	**TOPIC**
EnR-A-001	Describe the location, anatomy blood supply and functions of pituitary gland	Anatomy	Diencephalon (Endocrinology)
EnR-A-002	Describe the Thyroid, Parathyroid with their type, Relations, blood supply, and nerve supply.	Anatomy	Thyroid & Parathyroid gland
	Explain the anatomical basis for surgical removal of the glands of neck with special emphasis on the complications that can be encountered	Anatomy	
	Identify the Thyroid with their type, relations, blood supply, and nerve supply.	Anatomy	
EnR-A-003	Describe the structure, fascia, coverings, blood and nerve supply of testis	Anatomy	Testis
EnR-A-004	Describe the gross anatomical features and neuro-vasculature of epididymis and vas deferens, Seminal vesicles, Bulbourethral gland	Anatomy	Accessory Male organs
EnR-A-005	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		Prostate

EnR-A-006	Describe the anatomical basis and manifestations of the following conditions: 1) Hydrocele of spermatic cord and/or testes 2) Hematocele of testes 3) Torsion of the spermatic cord 4) Varicocele 5) Vestigial remnants of embryonic genital duct Describe the anatomical basis of vasectomy, & metastasis of cancer of testis and scrotum	Anatomy	Testis clinical conditions
EnR-A-007	Describe shape, relations blood supply & nerve supply of suprarenal gland	Anatomy	Supra-Renal Gland
	Explain the anatomical causes of Adrenal Abnormalities	Anatomy	
EnR-A-008	Define Bony Pelvis (Girdle) and describe the structures forming it.	Anatomy	Pelvic Girdle
	Describe the bones and salient anatomical features of Bony pelvis (girdle)	Anatomy	
EnR-A-009	Describe the type, articulations and mechanics of movements {axes and planes} of the following joints: 1) Sacro-Iliac 2) Pubic Symphysis 3) Lumbosacral 4) Sacrococcygeal	Anatomy	Sacroiliac- Joint
EnR-A-010	List the contents of True and False Pelvis	Anatomy	Bony Pelvis (Girdle)
	Tabulate the differences between male and female pelvis	Anatomy	
	Describe different types of pelvises	Anatomy	
	Describes different diameters of pelvis and their application in obstetric practice	Anatomy	
EnR-A-011	Describe the anatomical basis of pelvic fractures and their consequences	Anatomy	Pelvis (Girdle)

	Describe the topographical anatomy of pelvic walls and its components	Anatomy	
	Describe the mechanics of changes occurring in pelvic ligaments and joint mobility in late pregnancy	Anatomy	
EnR-A-012	Describe the topographical anatomy of pelvic floor.	Anatomy	Pelvic Floor
	Describe origin, insertion, nerve supply and actions of muscle forming pelvic floor	Anatomy	
EnR-A-013	Tabulate the attachments, innervations and actions of muscles forming the pelvic walls and floor	Anatomy	Pelvic Muscles
EnR-A-014	Describes injury to pelvic floor during child birth and its complications	Anatomy (Obs & Gynae)	Pelvic Girdle
EnR-A-015	Describe the peritoneal reflections in the male and female pelvis	Anatomy	Peritoneum peritoneal cavity of pelvis
EnR-A-016	Describe the gross anatomical features of Sacrum	Anatomy	Sacrum
EnR-A-017	Describe the gross anatomical features of pelvic fascia	Anatomy	Pelvic Fascia
EnR-A-018	Describe the boundaries of pelvic outlet and inlet	Anatomy	Pelvic Outlet and inlet
	Enumerate the structures passing through the pelvic inlet and pelvic outlet	Anatomy	
EnR-A-019	Tabulate the differences in peritoneal reflections in male and female pelvis	Anatomy	Peritoneal Reflection in Pelvis
EnR-A-020	Describe the origin, course, branches and distribution of common iliac artery	Anatomy	Pelvic Vessels
	Describe the origin, course, branches and distribution of external and internal iliac arteries	Anatomy	
	Describe the origin, course, tributaries and area of drainage of pelvic veins	Anatomy	
EnR-A-021	Describe the location, afferents and efferent of pelvic lymph nodes	Anatomy	Pelvic Lymph Nodes

EnR-A-022	Tabulate the origin, course, distribution and anastomosis of arteries of the pelvis	Anatomy	Pelvic vessels & pelvic nerves
	Describe the origin, root value, course, relations, branches and distribution of Pelvic nerves	Anatomy	
	Describe the anatomical basis and clinical picture for ligation of internal iliac artery and collateral circulation in pelvis	Anatomy	
	Describe the clinical picture and anatomical basis for the injury to pelvic nerves	Anatomy	
	Give anatomical justification for pelvic nerve blocks	Anatomy	
EnR-A-023	Describe the morphological features of urethra (male and female)	Anatomy	Pelvis
	Tabulate the parts of the male urethra with their location and salient features	Anatomy	
	Describe the clinical picture and anatomical justification for Ureteric Caliculi, Cystocele, Suprapubic Cystotomy, Rupture of Bladder	Anatomy	
	Describe the clinical picture and anatomical justification for Hypertrophy of Prostate	Anatomy	
	Describe the gross anatomical features of Ovaries and Fallopian Tubes with their relations, blood supply, nerve supply and lymphatic drainage Describe related clinical conditions: 1) Positions of ovaries 2) Cysts of ovaries 3) Ectopic pregnancy 4) Tubal ligation 5) Salpingitis	Anatomy	
	Describe the gross anatomical features, parts, peritoneal		

	ligaments, blood supply, nerve supply & lymphatic & clinical aspects of Uterus and Vagina Describe related clinical conditions 1. Prolapse of uterus 2. Vaginal trauma 3. culdocentesis	Anatomy	
	Describe, identify, justify and demonstrate the supports of uterus		
EnR-A-024	Describe the attachments of the perineal membrane and list its relations	Anatomy	Perineum
	Discuss the formation of Superficial and Deep Perineal Pouches	Anatomy	
	List the contents of Superficial and Deep Perineal Spaces	Anatomy	
	Tabulate the attachments, actions and nerve supply of muscles of perineum	Anatomy	
	Describe the topographical anatomy and neuro- vasculature of Penis	Anatomy	
	Tabulate the muscles forming the perineal body with their attachments and nerve supply	Anatomy	
EnR-A-025	Describe the clinical presentation and anatomical justification for: 1) Hypospadias 2) Phimosis 3) Circumcision 4) Erectile Dysfunction 5) Internal Hernias 6) Suprapubic Cystotomy 7) Rupture Of Bladder 8) Rectal Examination	Anatomy	Pelvis

	9) Disposition Of Uterus		
EnR-A-026	Describe the extent, structure, vascular supply, lymphatic drainage of Breast (Mammary Glands)	Integrate with Medicine	Mammary Gland
	Demonstrate palpation of breast and define its relation to the fibrous septa in Carcinoma of Breast	Integrate with Surgery	
	Explain the anatomical basis of position adopted for breast examination and mammography.	Integrate with Radiology	
CODES	**EMBRYOLOGY & POST-NATAL DEVELOPMENT**	**TOTAL HOURS=14**	
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPIC**
EnR-A-027	Describe the contributing factors, histogenesis and sequence of events of the development of Thyroid gland	Anatomy	Development of Thyroid gland
	Explain the embryological basis of the thyroglossal Cyst	Anatomy	
EnR-A-028	Describe the development of para-thyroid glands	Anatomy	Development Of Parathyroid glands
	Draw a concept map highlighting the development of para-thyroid gland	Anatomy	
EnR-A-029	Anatomically justify the clinical presentation of: 1. Ectopic Parathyroid 2. Aberrant Thyroid	Anatomy	Development of Thyroid, Parathyroid
EnR-A-030	Describe the development of pituitary gland Describe the embryological basis for the congenital anomalies of pituitary development	Anatomy	Development of Pituitary Gland
EnR-A-031	Describe the contributing factors, histogenesis and the development of adrenal gland	Anatomy	Development of Adrenal Gland
	Draw a concept map for the development of adrenal gland	Anatomy	

	Describe the embryological basis for the congenital anomalies of adrenal development	Anatomy	
EnR-A-032	Identify the stages in the development of the adrenal gland	Anatomy	Adrenal Gland
EnR-A-033	Describe the indifferent gonads	Anatomy	Development of Reproductive system
	List and describe the Factors influencing the differentiation of gonads	Anatomy	
	Evaluate the role of the factors influencing sex determination and differentiation	Anatomy	
	Describe the Development and descent of testis	Anatomy	
EnR-A-034	Describe the embryological basis and locations of undescended testes	Anatomy	Testes
EnR-A-035	Draw a concept map highlighting the development of testis	Anatomy	Development of Reproductive system
	Explain the Development and descent of ovaries	Anatomy	
	Draw a concept map highlighting the development of ovaries	Anatomy	
	Describe the anatomical basis for indifferent gonads, Klinefelter, turner syndromes & androgen insufficiency	Anatomy	
	Describe the Formation of Genital Ducts In different stage (paramesonephric and mesonephric ducts)	Anatomy	
	Describe the development of female genital ducts and glands, Development of uterus & Vagina. Describe related clinical anomalies: 1) Uterus Arcuatus 2) Uterus septus 3) Uterus Bicornis Bicollis 4) Uterus Bicornis Unicollis	Anatomy	

	5) Uterus Unicornis 6) Atresia of vagina 7) Double vagina 8) Imperforate hymen		
	Describe the development of male genital ducts and glands	Anatomy	
	Discuss the Development of male external genitalia	Anatomy	
	Describe the Development of female external genitalia	Anatomy	
	Explain the anatomical basis for the Associated congenital anomalies of male and female external genitalia (Hyposidiasis, Epispidiasis)	Anatomy	
	Describe the development of inguinal canal and descent of testis and embryological basis for Cryptorchidism, Ectopic Testis, Congenital Inguinal Hernia, Hydrocele	Anatomy	
	Klinefelter, turner syndromes & androgen insufficiency Describe the embryological basis for the coverings of testis	Anatomy	
CODES	**MICROSCOPIC STRUCTURE (HISTOLOGY & PATHOLOGY)**	**TOTAL HOURS =14**	
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPICS**
EnR-A-036	Describe the histological basis and manifestation of Gastric Carcinoid Tumors	Anatomy	Stomach
	Classify the principal Enteroendocrine Cells on the basis of type, location, hormone produced and Actions	Anatomy	
EnR-A-037	Describe microscopic structure of Pituitary gland.	Anatomy	Pituitary gland
	Classify pituitary gland on the basis of cell type, hormone produced and functions	Anatomy	

	Explain the histological basis and manifestation of Pituitary Adenomas	Anatomy	
EnR-A-038	Describe the light microscopic structure of Adrenal Gland	Anatomy	Adrenal gland
	Explain the histological basis and manifestation of Addison disease	Anatomy	
EnR-A-039	Describe the light microscopic structure of endocrine pancreas	Anatomy	Pancreas
	Classify the pancreatic islets on the basis of cell type, hormone produced and functions	Anatomy	
	Explain the histological basis and manifestation of Diabetes Mellitus	Anatomy	
	Explain the components and functions of neuroendocrine system	Anatomy	
EnR-A-040	Describe the light microscopic structure of Thyroid Gland	Anatomy	Thyroid and parathyroid glands
	Describe the light microscopic structure of Parathyroid Gland	Anatomy	
	Describe the light microscopic structure of Pineal gland	Anatomy	
EnR-A-041	Describe the light and ultramicroscopic structure of Testes, structure & function of Sertoli cells. Describe Blood testes Barrier	Anatomy	Testes
	Describe the histological basis and manifestation of Orchitis, Cryptorchidism	Anatomy	
EnR-A-042	Describe the light microscopic structure of Epididymis	Anatomy	Epididymis
EnR-A-043	Describe the light microscopic structure of vas deferens	Anatomy	vas deferens
EnR-A-044	Describe the light microscopic structure of seminal vesicle	Anatomy	Seminal vesicle

EnR-A-045	Describe the light microscopic structure of Prostate Gland	Anatomy	Prostate
	Describe the lobes of prostate and correlate with the pathologies of prostate	Anatomy pathology	
EnR-A-046	Describe the light microscopic structure of ovaries	Anatomy	Ovaries
	Describe the light microscopic structure of ovarian follicles in different stages of menstrual cycle.	Anatomy	
	Describe the histological basis and manifestation of Polycystic Ovary Syndrome	Anatomy pathology	
EnR-A-047	Discuss the light microscopic structure of uterus	Anatomy	Uterus
	Describe the light microscopic structure of different stages of Menstrual cycle	Anatomy	
	Describe the histological basis and manifestation of Endometriosis	Anatomy (Obs & Gynae)	
EnR-A-048	Describe the light microscopic structure of Fallopian Tube.	Anatomy	Fallopian Tube
EnR-A-049	Describe the light microscopic structure of Cervix	Anatomy	Cervix
	Describe the histological basis and manifestation of Cervical Carcinoma	Anatomy Pathology	
EnR-A-050	Describe the light microscopic structure of Vagina	Anatomy	Vagina
EnR-A-051	Describe light microscopic structure of mammary gland (inactive, during pregnancy, after lactation) Discuss histological basis of Breast cancer	Anatomy pathology	Mammary Gland

PRACTICAL			
CODES	**HISTOLOGY**	**TOTAL HOURS = 11**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPICS**
EnR-A-052	Identify draw & Label the Pituitary gland under light microscope	Anatomy	Pituitary gland
EnR-A-053	Identify draw & label the Thyroid & Parathyroid glands under light microscope	Anatomy	Thyroid & Parathyroid gland
EnR-A-054	Identify draw & Label the Adrenal gland under light microscope	Anatomy	Adrenal Gland
EnR-A-055	Identify draw & Label Testes, Epididymis & Vas deferens under the light Microscope	Anatomy	Testes Epididymis Vas Deferens
EnR-A-056	Identify draw & Label the seminal vesicle & prostate gland under the light Microscope	Anatomy	Seminal Vesicle, Prostate gland
EnR-A-057	Identify, draw and label the ovaries under light microscope	Anatomy	Ovaries
EnR-A-058	Identify, draw and label the slide of different phases of uterus under light microscope	Anatomy	Uterus
EnR-A-059	Identify, draw and label the fallopian tube under light microscope	Anatomy	Fallopian Tube
EnR-A-060	Identify, draw and label the cervix under light microscope	Anatomy	Cervix
EnR-A-061	Identify, draw and label the vagina under light microscope	Anatomy	Vagina
EnR-A-062	Identify, draw and label the mammary gland (different stages) under light microscope	Anatomy	Mammary gland

NORMAL FUNCTION			
THEORY			
CODES	**MEDICAL PHYSIOLOGY**	**TOTAL HOURS = 59**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPICS**
EnR-P-001	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.	Physiology	Introduction to Endocrinology

EnR-P-002	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- hypophyseal 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.	Physiology	Hypothalamus and Pituitary Gland

EnR-P-003	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 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 hyperthyroidisms 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	Physiology	Thyroid gland
	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		

EnR-P-004	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. 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	Physiology & pathology	Adreno cortical hormones
	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		

EnR-P-005	and lipid metabolism.	Physiology	Pancreatic hormones
	Enlist the actions of insulin on liver, adipose tissue and skeletal muscle.		
	Enlist the factors and conditions that increase or decrease insulin		
	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		
	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 Explain the features, cause of insulinoma	Physiology	Abnormalities of glucose regulation
EnR-P-006	Discuss the physiological anatomy of parathyroid gland Explain the rapid and slow mechanism of resorption of bone by parathyroid hormone	Physiology	Parathyroid hormones

	Discuss the actions of parathyroid Explain the control of parathyroid secretion by calcium ion concentration		
EnR-P-007	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	Physiology	Regulation of calcium in body
EnR-P-008	Enlist the functions of adrenal medullary hormones and explain pheochromocytoma	Physiology	Adreno medullary hormones
EnR-P-009	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	Physiology	Spermatogenesis,Capacitation & Acrosome reaction

EnR-P-010	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	Physiology	Testosterone
EnR-P-011	Enumerate and explain the phases of ovarian cycle along with the hormonal changes 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	Physiology	Menstrual cycle
EnR-P-012	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	Physiology	Female sexual hormones
EnR-P-013	Explain the physiological basis of puberty, menarche Define menopause	Physiology	Puberty, menarche &

	Explain the cause of menopause Discuss the physiological changes in the function of the body at the time of menopause		menopause
EnR-P-014	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	Physiology	Normal pregnancy
EnR-P-015	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	Physiology	Lactation
CODE	**MEDICAL BIOCHEMISTRY**	**TOTAL HOURS =35**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPICS**
EnR-B-001	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	Biochemistry	Introduction to Endocrinology

	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		Introduction to Endocrinology
EnR-B-002	Describe the features of Signal transduction Describe different types of receptors	Biochemistry	Signal Transduction
EnR-B-003	Discuss the classification of hormones	Biochemistry	Classification of hormones
	Describe different types of second messengers Differentiate the G protein and non-G protein mediated pathways of signal transduction Discuss the hormones which act through: Cyclic AMP (Adenosine monophosphate) Discuss the hormones which act through: Cyclic GMP (guanosine monophosphate)		

EnR-B-004	Discuss the hormones which act through calcium phosphoinositol Describe the Receptor tyrosine kinase pathway of signal transduction	Biochemistry	Second messengers
	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	Biochemistry	
	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	Biochemistry	
	Interpret disorders of hormones on the basis of sign, symptoms and given data	Biochemistry	
EnR-B-005	Explain the synthesis, secretion, transport and clearance of steroid and protein hormones.	Biochemistry	Synthesis of Hormones
EnR-B-006	Enlist the steps in the synthesis of adrenocortical hormone. Explain the synthesis and secretion of ACTH (Adrenocorticotropic hormone) in association with melanocyte-stimulating hormone, lipotropin, and endorphin.	Biochemistry	Synthesis of ACTH & adrenocortical
EnR-B-007	Explain the structure, biosynthesis, secretion, transport, regulation, catabolism, mechanism of action and biochemical role of testosterone, progesterone and estrogen	Biochemistry	Synthesis of testosterone, progesterone and estrogen

EnR-B-008	Discuss the role of steroid hormones in oral contraception, Infertility	Biochemistry	Steroid in infertility
EnR-B-009	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	Biochemistry	Nomenclature of genetics
EnR-B-010	Discuss the structures of genes, how they are organized and regulated.	Biochemistry	Genes
EnR-B-011	Describe Mendelian Law of Segregation and Law of Independent Assortment.	Biochemistry	Mendelian laws
EnR-B-012	Describe the patterns of inheritance characteristic of autosomal dominant, autosomal recessive, X- linked dominant, X-linked recessive and mitochondrial traits.	Biochemistry	Patterns of inheritance
EnR-B-013	Interpret genetic symbols as they appear in pedigrees.	Biochemistry	Pedigrees
EnR-B-014	Analyze pedigree to determine the mode of inheritance of following traits: 1) X-linked recessive (Duchenne Muscular dystrophy) 2) X-linked dominant (Rickets) 3) Autosomal recessive (Xeroderma Pigmentosum) 4) Autosomal dominant (Huntington's Disease)) 5) Mitochondrial disorder (Mitochondrial diabetes)	Biochemistry	Mode of inheritance

EnR-B-015	Discuss different structural and numerical chromosomal abnormalities.	Biochemistry	Chromosomal abnormalities
EnR-B-016	Interpret the normal human karyotype in terms of number and structure of chromosomes.	Biochemistry	Karyotypes
EnR-B-017	Describe the effect of the following chromosomal mutations on a segment of DNA: point mutation, frameshift mutation, deletion, insertion, inversion, Robertsonian Translocation and mosaicism.	Biochemistry	Mutations
EnR-B-018	Discuss the concept of central dogma from gene to protein (replication, transcription and translation)	Biochemistry	Central dogma (Overview)
EnR-B-019	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.	Biochemistry	Prokaryotic DNA replication
EnR-B-020	Describe in detail all the steps in Eukaryotic DNA replication with emphasis on differences between pro- and Eukaryotes	Biochemistry	Eukaryotic DNA replication
EnR-B-021	Discuss telomeres and their clinical significance		Telomeres and telomerase
EnR-B-022	Describe DNA repair, mutation and cancers		DNA Repair
	Interpret Xeroderma pigmentosa on basis of sign/symptoms and data		
EnR-B-023	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 prokaryotes

EnR-B-024	Illustrate the transcription in eukaryotes focusing on the differences between pro- and eukaryotic replication	Biochemistry	Transcription in Eukaryotes
EnR-B-025	Discuss post transcriptional modifications		Post transcriptional modifications
EnR-B-026	Describe the role of Wobble hypothesis in codon recognition by tRNA		Wobble hypothesis
EnR-B-027	Interpret the translation focusing on the following key points: Initiation, elongation and termination		Translation
EnR-B-028	Describe Post-translational modification of proteins Illustrate RNA dependent synthesis of RNA and DNA	Biochemistry	Post- translational modification
EnR-B-029	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	Biochemistry	Gene Expression
EnR-B-030	Discuss the following Recombinant DNA techniques with reference to their principles, procedures and application: 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	Biochemistry	Techniques

PRACTICAL			
CODES	BIOCHEMISTRY	TOTAL HOURS=06+02=08	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPICS
EnR-B-031	Perform DNA extraction	Biochemistry	DNA
EnR-B-032	Perform Electrophoresis	Biochemistry	Electrophoresis
EnR-B-033	Perform PCR	Biochemistry	PCR
EnR-B-034	Demonstrate ELISA (enzyme-linked immunoassay) to measure concentration of hormones	Biochemistry	ELISA
EnR-P-035	Perform Pregnancy test	Physiology	Pregnancy test
CODES	PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS	TOTAL HOURS =02	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPICS
EnR-Ph-001	Explain the mechanism of action of thyroxine Explain Clinical uses and potential adverse effects with use of Thyroxine	Pharmacology	Anti-thyroid substance & MOA, uses, effects
CODES	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS =12	
		DISCIPLINE	TOPICS
EnR-Pa-001	Enumerate clinical manifestations along with hormone levels of anterior pituitary Classification of pituitary adenomas	Pathology	Pathology of Anterior Pituitary Gland

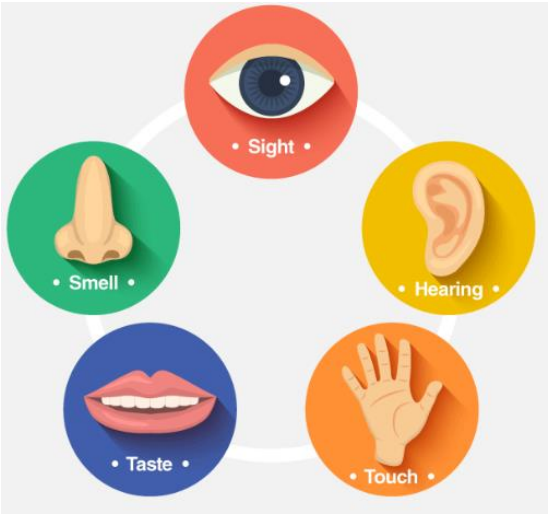
EnR-Pa-002	Enumerate and describe posterior pituitary syndromes (inappropriate ADH (Anti Diuretic Hormone) secretion, diabetes insipidus)	Pathology	Pathology of Posterior Pituitary Gland
EnR-Pa-003	Define thyroiditis Describe salient morphological features of clinically significant subtypes of thyroiditis i. Hashimoto Thyroiditis ii. Granulomatous Thyroiditis	Pathology	Thyroiditis
EnR-Pa-004	Describe the pathogenesis & salient morphological features of Grave's Disease Describe the pathogenesis & salient morphological features of Diffuse and Multinodular goiter	Pathology	Grave's Disease
EnR-Pa-005	Enumerate causes of hypo and hyperthyroidism along with levels of thyroid hormones	Pathology	Pathology of Thyroid Gland
EnR-Pa-006	Enumerate causes of hypercalcemia, hyper and hypoparathyroidism	Pathology	Pathology of Parathyroid Gland
EnR-Pa-007	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	Pathology of Endocrine Pancreas Gland
EnR-Pa-008	Enumerate causes of Cushing syndrome with lab investigations Causes and clinical features of adrenocortical insufficiency (Addison disease)	Pathology	Pathology of Adrenal Gland
EnR-Pa-009	Describe the morphological features of inflammatory disorders of breast.	Pathology	Breast
	Enumerate causes of lower genital tract infections and PIDs along with lab investigations Enumerate causes of infertility in females along with		

EnR-Pa-010	hormonal investigations Causes of dysfunctional uterine bleeding with histopathological features Pathophysiology and lab diagnosis of eclampsia and preeclampsia Causes of placental implantations (ectopic pregnancy)	Pathology	Female Reproductive Pathology
EnR-Pa-011	Enumerate causes of inflammation of male genital tract Causes of male infertility with semen analysis Describe pathological features of testicular torsion	Pathology	Male Reproductive Pathology
CODES	**DISEASE PREVENTION AND IMPACT**	**TOTAL HOURS = 05**	
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPICS**
EnR-CM-001	Define Diabetes Mellitus according to WHO (World Health Organization) criteria Classify types of Diabetes Mellitus	Community Medicine and Public Health	Diabetes
	Describe epidemiological risk factors for Diabetes Epidemiological distribution & statistics of DM Screening of community for Diabetes Apply levels of prevention for control of Diabetes.	Community Medicine and Public Health	
EnR-CM-002	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.	Community Medicine	Genetics

EnR-CM-003	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.	Community Medicine	Reproductive health
CODES	**BEHAVIORAL SCIENCES**	**TOTAL HOURS =01**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPICS**
EnR-BhS-001	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.	Behavioral Sciences	Sexual difficulties and Medical Practices
AGING			
CODES	**THEORY**	**TOTAL HOURS =01**	
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPICS**
EnR-Ag-001	Enlist the changes that occur in female body after menopause.	Gynae/ OBS	Menopause

LAHORE
MEDICAL & DENTAL
COLLEGE

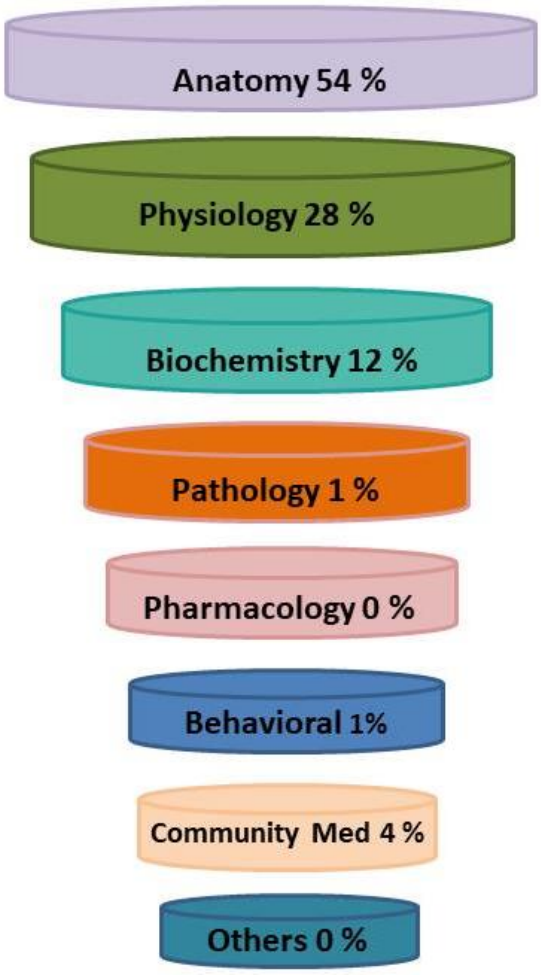
HEAD & NECK, SPECIAL SENSES MODULE



INTRODUCTION TO MODULE

Program	MBBS
Year	Two
Module No.	09
Module Title	Head & Neck, special senses Module
Module weeks	05
Recommended minimum hours	158

Integrated Disciplines of Head & Neck, special senses module



MODULE DESCRIPTION

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.

MODULE OUTCOME

- 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, 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

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.

THEMES

- Vision
- Hearing
- Taste
- Olfaction
- Head & Neck

CLINICAL RELEVANCE

- Glaucoma
- Cataract
- Night Blindness
- Conjunctivitis
- Impacted Wax
- Otitis Media
- Otomycosis
- Glue Ear
- Rhiniti

TIME TABLE

SUBJECT WISE TIME ALLOCATION

Subject	Time allocated (Hours)	Discipline
Anatomy (88)		**Anatomy**
Gross Anatomy	**56**	
Embryology & post natal development	**15**	
Microscopic structure	**8**	
Histology Practical	**9**	
Medical Physiology (46)		**Physiology**
Theory	**30**	
Practical	**16**	
Medical Biochemistry (12)		**Biochemistry**
Theory	**7**	
Practical	**5**	
Pathophysiology & Pharmacotherapeutics	**3**	**Pathology**
Disease prevention & impact	**6**	**Community medicine. otorhinolaryngology, Behavioral sciences**
Aging	**3**	**otorhinolaryngology, Anatomy**

LEARNING OBJECTIVES

NORMAL STRUCTURE			
THEORY			
CODE	**GROSS ANATOMY**	**TOTAL HOURS = 56**	
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPIC**
HNSS-A-001	Define the boundaries and openings of orbital cavity. List orbital contents and structures traversing these openings.	Human Anatomy	Vision
	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, brnaches 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 giving their location and anatomical features. Describe the nerve supply of lacrimal gland	Human Anatomy	

	Describe the location, roots and distribution of pterygopalatine ganglia.	Anatomy	Vision
	Give the anatomical structure of eyeball emphasizing on its three coats and their neurovascular supply	Human Anatomy	
HNSS-A-002	Describe the boundaries of nasal cavity: nasal septum, lateral wall of nose, roof and floor. Give their anatomical features and neurovascular supply.	Human Anatomy	Olfaction
	Describe the anatomical features and neurovascular supply of external nose	Human Anatomy	
	List the paranasal sinuses giving their locations, openings, neurovascular supply and clinical significance.	Human Anatomy	
	Describe the course and distribution of olfactory nerve in reference to olfactory pathway. Give the effects of its lesions.	Human Anatomy	
	Describe the anatomical features and neurovascular supply of external ear	Human Anatomy	
HNSS-A-003	Describe the boundaries, contents, neurovascular supply and communications of middle ear cavity.	Human Anatomy	Hearing
	Describe the parts, anatomical features and neurovascular supply of internal ear.	Human Anatomy	
	Describe the course and distribution of vestibulocochlear neve mentioning the effects of its lesion. Describe auditory pathway.	Human Anatomy	

HNSS-A-004	Describe the anatomical features of tongue with emphasis on its mucosa, attachments, musculature, vasculature and lymphatic drainage.	Human Anatomy	Taste
	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.	Human Anatomy	
	Discuss lesions of motor and sensory nerve supplying the tongue. Discuss the anatomical correlates of lingual carcinoma in reference to lymphatic drainage of tongue	Human Anatomy	
HNSS-A-005	Describe the features of Norma Frontalis, Norma Verticalis, Norma Parietalis, Norma occipitalis and Norma Basalis	Human Anatomy	Skull
	Describe the features of Norma lateralis: temporal, infratemporal & pterygopalatine fossae giving their boundaries, contents and communications.	Human Anatomy	
	Discuss the sutures and fontanelles of skull, their age changes and clinical significance.	Human Anatomy	
	List the layers of scalp and describe the anatomical features with neurovascular supply and lymphatic drainage of scalp.	Human Anatomy	

HNSS-A-006	Give anatomical justification of spread of scalp infections, profuse bleeding in superficial scalp lacerations, gaping of scalp wounds and black eye.	Human Anatomy	Scalp
HNSS-A-007	Enlist in tabulated manner the muscles of facial expression and mastication, giving their nerve supply and actions. Define modiolus.	Human Anatomy	Muscles of facial expressions
HNSS-A-008	Describe the functional modalities, course, branches, and distribution o0f cranial nerves innervating the face (sensory & motor) trigeminal and facial nerves	Human Anatomy	Neurovascular supply of face
	Describe the vascular supply and lymphatic drainage of face.	Human Anatomy	
	Draw a diagram to illustrate cutaneous innervation of face.	Human Anatomy	
	Discuss anastomoses of facial artery with contralateral vessels and branches of internal carotid artery with their significance.	Human Anatomy	
HNSS-A-009	Describe the danger area of face with it its clinical significance. Define the routes of spread of infection from face and scalp to intracranially.	Human Anatomy	Danger area
HNSS-A-010	Describe the bony features and muscle attachment of mandible.	Human Anatomy	Mandible

	Classify temporomandibular joint mentioning its ligaments, relations, nerve supply and movements (with their mechanics and muscles producing them).	Human Anatomy	
HNSS-A-011	Describe anatomical features, relations and neurovascular supply of parotid gland and its duct, mentioning the structures entering and exiting the gland	Human Anatomy	Parotid gland
	Discuss the clinical correlates of parotid gland: parotiditis, Mumps, Frey's syndrome, parotid duct stones and parotid tumor surgery with its complications	Human Anatomy	
HNSS-A-012	Describe the parts and boundaries of oral cavity and give its relation to the Waldeyers' ring.	Human Anatomy	Waldeyers' ring
HNSS-A-013	Describe the anatomical features of hard and soft palate with their neurovascular supply.	Human Anatomy	Hard and soft palate
HNSS-A-014	Describe anatomical features, relations and neurovascular supply of submandibular and sublingual glands with their ducts.	Human Anatomy	Submandibular Sublingual glands
HNSS-A-015	Describe the location, roots and distribution of otic and submandibular ganglia.	Human Anatomy	Otic and Submandibular ganglia
HNSS-A-016	Describe the anatomical features of Hyoid bone and give attachments on the bone.	Human Anatomy	Hyoid bone

HNSS-A-017	Enumerate the types of cervical vertebrae and list the differences between them.	Human Anatomy	Cervical vertebrae
	Describe the anatomical features and attachments on cervical vertebrae	Human Anatomy	
	Classify the joints of cervical vertebrae mentioning their ligaments, movements with muscle producing them and neurovascular supply.	Human Anatomy	
HNSS-A-018	List the prevertebral muscles of cervical region. Describe their attachments, actions and innervation.	Human Anatomy	Prevertebral muscles
HNSS-A-019	Enumerate parts of deep cervical fascia with their respective extents, attachments, relations and contents.	Human Anatomy	Deep cervical fascia
HNSS-A-020	Describe the facial spaces in head and neck mentioning their communications and their relation to spread of infection.	Human Anatomy	Facial spaces
HNSS-A-021	Describe the attachments, actions and nerve supply of infrahyoid and suprahyoid muscles of neck.	Human Anatomy	Infrahyoid and suprahyoid muscles
HNSS-A-022	Describe the location, formation and distribution of ansa cervicalis.	Human Anatomy	**A**nsa cervicalis.
HNSS-A-023	Describe the attachments, actions and nerve supply of sternocleidomastoid and trapezius.	Human Anatomy	Sternocleidoma - stoid and trapezius

HNSS-A-024	Describe the boundaries and contents of suboccipital, anterior and posterior triangles of neck.	Human Anatomy	Triangles of neck
HNSS-A-025	Describe the cervical part of trachea and esophagus with their neurovascular supply.	Human Anatomy	Trachea and esophagus
HNSS-A-026	Describe the location, anatomical features and vascular supply of thyroid and parathyroid glands. List the variations in location of parathyroid glands.	Human Anatomy	Thyroid, Parathyroid glands
HNSS-A-027	Describe the carotid arteries mentioning their origin, course, branches, distribution and termination.	Human Anatomy	Carotid arteries
HNSS-A-28	Describe carotid body and carotid sinus and give their clinical significance.	Human Anatomy	Carotid body
HNSS-A-029	Give the venous drainage of Head and neck region. Describe the formation, tributaries and area of drainage of vessels constituting jugular venous system.	Human Anatomy	Head & Neck venous supply
HNSS-A-030	Name the superficial and deep cervical lymph nodes and give their location and drainage areas	Human Anatomy	Lymphatics
HNSS-A-031	Describe the location, formation, branches, distribution and lesions of cervical plexus	Human Anatomy	Cervical plexus

HNSS-A-032	Name the parts of pharynx giving their extent, anatomical features, structure and neurovascular supply.	Human Anatomy	Pharynx
	Name the pharyngeal constrictor muscles defining their attachments, innervation and structure traversing the gaps between adjacent muscles.	Human Anatomy	
HNSS-A-033	Name the parts of larynx giving their extent, anatomical features, musculoskeletal framework and neurovascular supply.	Human Anatomy	Larynx
HNSS-A-034	Discuss the location, anatomical features, relations and vascular supply of tonsils: nasopharyngeal, palatine and lingual.	Human Anatomy	Tonsils
CODE	**EMBRYOLOGY & POST-NATAL DEVELOPMENT**	**TOTAL HOURS = 15**	
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPIC**
HNSS-A-035	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.	Embryology	Pharyngeal apparatus pharyngeal arches
HNSS-A-036	Describe the development and histogenesis of auditory tube, tympanic cavity, tonsils, thymus and Parathyroid	Embryology	Auditory tube, tympanic cavity, tonsils, thymus and parathyroid

HNSS-A-037	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	Embryology	Congenital anomalies
HNSS-A-038	Describe the development of face and nasolacrimal duct and their respective congenital anomalies.	Embryology	Face and nasolacriml duct
HNSS-A-039	Describe the development of nasal cavity and paranasal sinuses. Give the associated congenital anomalies.	Embryology	Nose
HNSS-A-040	Describe the development of lip and palate and their associated congenital malformations.	Embryology	Lips and palate
	Explain the types and embryologic basis of cleft lip and cleft palate.	Embryology	
HNSS-A-041	Describe the development of optic vesicle and Retina	Embryology\	Eye & ear
	Describe the development of cornea, sclera, choroid, iris, ciliary body and lens and relate it to their respective congenital anomalies.	Embryology	
	Describe the development of internal ear and give the embryological basis of associated congenital anomalies	Embryology	

HNSS-A-041	Describe the development of cornea, sclera, choroid, iris, ciliary body and lens and relate it to their respective congenital anomalies.	Embryology	Eye & ear
	Describe the development of internal ear and give the embryological basis of associated congenital anomalies.	Embryology	
CODE	**MICROSCOPIC ANATOMY (HISTOLOGY & PATHOLOGY)**	**TOTAL HOURS = 08**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**
HNSS-A-042	Describe the light and electron microscopic structure of tongue mentioning the histological structure of lingual papillae and taste buds.	Histology	Tongue
HNSS-A-043	Describe the histological structure of parotid, submandibular and sublingual glands.	Histology	Glands
	Compare and contrast the histological structures of parotid, submandibular and sublingual glands	Histology	
HNSS-A-044	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.	Histology	Head & Neck
HNSS-A-045	Describe the histological structure of layers of eyeball, eyelid and retina.	Histology	Eye
	Describe the light and electron microscopic structure of cornea	Histology	

HNSS-A-046	Describe the histological and ultramicroscopic structure of internal ear with special reference to Organ of Corti.	Histology	Ear
PRACTICAL			
CODE	**HISTOLOGY**	**TOTAL HOURS = 09**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**
HNSS-A-049	Identify, draw and label diagrams to show histological structure of tongue, lingual papillae and taste buds.	Histology	tongue
HNSS-A-050	Identify, draw and label a diagram to show histological structure of parotid, submandibular and sublingual glands.	Histology	Glands
HNSS-A-051	Draw and label diagrams to show histological structure of serous demilunes, serous and mucous acini.	Histology	Head & Neck
HNSS-A-052	Draw and label a diagram to show histological structure of thyroid and parathyroid gland.	Histology	Thyroid, Parathyroid
HNSS-A-053	Draw and label diagrams to show histological structure of eyelid and cornea.	Histology	Eye
	Draw and label a diagram to show histological structure of retina. List its histological layers and their respective components	Histology	
HNSS-A-054	Draw and label a diagram to show histological structure of internal ear.	Histology	Ear

NORMAL FUNCTION THEORY			
CODE	**MEDICAL PHYSIOLOGY**	**TOTAL HOURS = 30**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**
HNSS-P-001	Define and describe the visual acuity	Physiology	Visual acquity
	Define Emmetropia	Physiology	
	Enlist the errors of refraction	Physiology	
	Explain the cause, features, physiological basis, and correction of Hyperopia	Physiology	
	Explain the cause, features, physiological basis, and correction of myopia	Physiology	
	Explain the cause, features, physiological basis, and correction of astigmatism	Physiology	
	Describe the pathophysiology and treatment of cataract	Integrate with Ophthalmology	
HNSS-P-002	Interpret common treatment modalities for refractive errors	Physiology	Refractive Errors
HNSS-P-003	Describe the mechanism of formation and outflow of aqueous humor	Physiology	Fluid systems of the Eye
	Describe normal value of intraocular pressure and its regulation	Physiology	
	Describe the method for measuring the intraocular pressure	Integrate with Ophthalmology	
HNSS-P-004	Describe the causes and feature and pathophysiology of glaucoma	Physiology	Glaucoma
	Discuss the clinical features of Open Angle and Angle Closure Glaucoma	Physiology	

HNSS-P-005	Describe the physiological anatomy and function of structural elements of retina	Physiology	Retina
	Enlist different layers of retina	Physiology	
	Explain the significance of melanin pigment in retina	Physiology	
	Describe macula and foveal region of retina and their significance	Physiology	
	Describe the structure of rods and cones	Physiology	
	Comment on the location of optic disc and its significance	Physiology	
	Describe the cause, features, and treatment of retinal detachment	Physiology	
	Differentiate the visual pathway from the cones to the ganglion cells and from rods to the ganglion cells		
	Enlist the current investigations for Retinal Diseases	Integrate with Ophthalmology	
HNSS-P-006	Describe the rhodopsin-retinal visual cycle	Physiology	Photochemistry of vision
	Describe the mechanism of excitation of rods/ rods receptor potential	Physiology	
	Describe the causes and treatment of night blindness	Physiology	
HNSS-P-007	Define and describe different mechanisms of light adaptation	Physiology	Adaptation
	Define and describe different mechanisms of dark adaptation	Physiology	
	Enumerate the diseases leading to Night Blindness and retinal detachment	Integrate with Ophthalmology	
	Explain the tricolor mechanism of color determination	Physiology	
	Define term protanopes, deuteranopes, tritanopes	Physiology	

HNSS-P-008	Enlist the types of color blindness and their causes	Physiology	Color vision
	Enlist clinical features of Color vision deficiencies	Integrate with Ophthalmology	
HNSS-P-009	Trace the visual pathway	Physiology	Visual Pathways
	Enlist and describe the abnormalities of visual pathway & visual field		
	Explain the effect of removal of primary visual cortex		
HNSS-P-010	Define the physiological blind spot and describe its location	Physiology	Field of vision
	Define scotoma/ pathological blind spot and enlist causes	Physiology	
HNSS-P-011	Illustrate the abnormalities of field of vision	Integrate with Ophthalmology	Visual fields
HNSS-P-012	Describe the muscular and neural control of eye movements	Physiology	Eye movements
HNSS-P-013	Define and enlist the types of Strabismus	Integrate with Ophthalmology	Strabismus
HNSS-P-014	Explain the mechanism of accommodation	Physiology	Accommodation
	Enlist the components of near response in accommodation	Physiology	
	Describe the neural pathway for accommodation reflex	Physiology	
	Describe the regulation of accommodation	Physiology	
	Enlist the clinical features of Presbyopia	Integrate with Ophthalmology	
	Trace the neural pathway for pupillary light reflex	Physiology	
	Explain the pupillary light reflexes or reactions in	Physiology	

HNSS-P-015	CNS diseases		Pupillary light reflex
	Describe the cause and features of Horner syndrome	Physiology	
	Illustrate the differential diagnosis of Anisocoria	Integrate with Ophthalmology	
HNSS-P-016	Describe the physiological anatomy of outer and middle ear	Physiology	Sense of hearing
	Enlist the functions of middle ear	Physiology	
	Discuss clinical features and treatment of impacted wax	Integrate Otorhinolaryngology	
	Define causes and clinical features of Otomycosis	Integrate Otorhinolaryngology	
	Describe the mechanism of impedance matching and its significance	Physiology	
	Describe the mechanism of attenuation reflex and its significance	Physiology	
HNSS-P-017	Describe the physiological anatomy of inner ear	Physiology	Inner Ear/ Cochlea
	Describe the mechanism of transmission of sound waves in cochlea	Physiology	
HNSS-P-018	Describe the physiological anatomy and function of organ of Corti	Physiology	Organ of Corti
	Describe the mechanism of generation of endo-cochlear potential and its significance	Physiology	

HNSS-P-019	Write down the normal range of frequency for hearing	Physiology	Determination of sound frequency
	Describe the role of place principle in determination of sound frequency	Physiology	
	Describe the role of volleys principle in determination of sound frequency	Physiology	
HNSS-P-020	Discuss determination of loudness of sound	Physiology	Determination of loudness
HNSS-P-021	Trace the normal auditory nervous pathway	Physiology	Auditory pathway
	Describe the types of deafness	Physiology	
	Discuss the clinical features and investigations of Congenital and Acquired hearing loss	Integrate with Otorhinolaryngology	
HNSS-P-022	Enlist the primary taste sensations	Physiology	Sense of Taste
	Define and explain the term taste blindness	Physiology	
	Describe the physiological anatomy and location of taste buds	Physiology	
HNSS-P-023	Describe the mechanism of stimulation of taste buds/ receptor potential	Physiology	Excitation of Taste buds
	Trace the pathway of taste sensation	Physiology	
HNSS-P-024	Define and explain the terms: Ageusia, Hypergeusia, Hypogeusia and dysgeusia	Physiology	Abnormalities of Taste sensations
	Describe the senile changes in taste buds		
HNSS-P-025	Explain the terms: Taste preference and taste aversion	Physiology	Taste preference and aversion

HNSS-P-026	Enlist the primary sensations of smell	Physiology	Sense of smell
	Describe the physiological anatomy and location of olfactory membrane	Physiology	
HNSS-P-027	Enlist the causes and clinical features of Rhinitis	Integrate with Otorhinolaryngology	Rhinitis
	Differentiate between viral and allergic Rhinitis	Integrate with Otorhinolaryngology	
CODE	**MEDICAL BIOCHEMISTRY**	**TOTAL HOURS = 7**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**
HNSS-B-001	Discuss the metabolism of mono and Disaccharides	Biochemistry	Metabolism of mono and disaccharides
	Interpret Hereditary fructose intolerance, fructosuria, galactosemia and lactose intolerance, in relevance to the clinical findings	Biochemistry	
	Explain the Polyol pathway and effect of hyperglycemia on sorbitol pathway	Biochemistry	
	Discuss the sources, metabolically active forms, biochemical role and clinical correlation of Vit-A with vision	Biochemistry	

PRACTICAL			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 16+05=21**	
		DISCIPLINE	**TOPIC**
HNSS-P-028	Examine the Second, Third, Fourth & Sixth Cranial Nerves	Physiology	Cranial Nerves
HNSS-P-029	Examination of Light Reflex		Light reflex
HNSS-P-030	Determine the Visual Acuity for Far and Near vision		vision
HNSS-P-031	Perform Ophthalmoscopy		ophthalmoscopy
HNSS-P-032	Examine Field of Vision and interpretation of visual field plotted	Physiology	Visual field
HNSS-P-033	Examine Color Vision		Color vision
HNSS-P-034	Perform Tuning fork test and audiometry, interpret the report		Ear
HNSS-B-002	Interpretation of insulin and C peptide	Biochemistry	Interpretation of results
HNSS-B-003	Demonstrate HbA1C		HbA1C
HNSS-B-004	Detect abnormal constituents in urine by chemical methods		Abnormal constituents in urine

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 03**	
HNSS-Pa-001	Enlist the common causative agents of Eye, Ear Infection	Pathology (Microbiology)	Eye/Ear infections
	Discuss the pathogenesis and clinical features of common pathogens	Patholog (Microbiology)	
DISEASE PREVENTION AND IMPACT			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 06**	
		DISCIPLINE	**TOPIC**
HNSS-CM-001	Identify factors leading to noise pollution	Community Medicine/ Otorhinolaryngology	Hearing loss
HNSS-CM-002	Describe the common causes of blindness in community	Community Medicine	Blindness
	Describe risk factors and preventive strategies for blindness at community level	Behavioral Sciences	
HNSS-BhS-001	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.		Pain

AGING			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 03**	
		DISCIPLINE	**TOPIC**
HNSS-Ag-002	Familiarize with the age-related hearing loss	Otorhinolaryngology	Deafness
HNSS-Ag-002	Discuss the age changes of mandible	Anatomy	Head & Neck

LEARNING METHOLDOGIES

Delivery of curriculum needs diversity of teaching strategies for better understanding. Thus, the following teaching methodologies may be used to facilitate students.

- large group interactive session
- Team based learning
- Problem based learning
- Tutorials
- Laboratory practical
- Demonstration
- Clinical case based conferences
- Skill Laboratories

Large group interactive session

Lecture format is the most widely used approach to teaching especially in a large class size with average attention span of 20-30 mins. Interactive lecturing involves a two-way interaction between the presenter and the participants. Interactive methods like brainstorming buzz group, simulation, role play and clinical cases can be used.

Significance of its usage:

- Relaxed environment, diverse opinions, active involvement
- Increased attention and motivation
- Independence and group skills
- Cost effective
- Suitable for taking advantage of available audiovisual technologies

Team based learning (TBL)

BL is a uniquely powerful form of small group learning. It provides a complete coherent framework for building a flipped course experience. There are four essential elements of TBL which includes;

- Teams must be properly formed and managed (5-7 students)

- Getting students ready
- Applying course concepts
- Making students accountable

Significance of its usage:

- Students are more engaged.
- Increased excitement in TBL classroom
- Teams outperforms best members
- Students perform better in final and standardized exams.

Problem based learning (PBL)

It is an instructional student-centered approach in which students work in small groups on a health problem, identifying their own educational needs and being responsible for the acquisition of the knowledge required to understand the scenario.

Significance of its usage:

- Teamwork
- Critical evaluation of literature
- Self-directed learning and use of resources
- Presentation skills
- Leadership
- Respect for colleagues' views

Tutorials

Tutorial is a class or short series of classes, in which one or more instructors provides intensive instruction on some subject to a small group. Its purpose is to explore students' point of view, allowing time for discussion, and inculcating self-directed, reflective learning skills.

Significance of its usage

- Develop and assess the extent of background knowledge of students, which enables them to properly understand concepts which may not have been understood in lectures.
- Develop problem-solving skills.

- Develop practice of self-learning.
- Reduced time to understand the topic.

Laboratory Practical

Lab practical involve things like identifying a structure, a type of stain through a microscope, a problem with a preparation, reading biochemical test results and answering safety questions. These simulations allow students to attempt the experiments in the laboratory in a risk-free way that provides the opportunity to make mistakes and learn how to correct them using the immediate feedback generated.

Significance of its usage

- Enhance mastery of subject matter.
- Develop scientific reasoning.
- Develop practical skills.
- Develop teamwork abilities.

Demonstrations

The demonstration method in teaching can be defined as giving a demo or performing a specific activity or concept. It is a teaching-learning process carried out in a very systematic manner.

Significance of its usage

- Promotes learning and correlates theory with practice.
- Sharpens the observation skills.
- Sustain interests in learning environment.
- Helps teacher to evaluate students' response

Clinical case based conferences

Clinical Case based conferences allow clinicians and medical students to present difficult case material and include discussions of diagnostic, clinical formulation, and/or treatment issues.

Significance of its usage

- Provides detailed (rich qualitative) information.

- Provides insight for further research.
- Permitting investigation of otherwise impractical (or unethical) situations.

Skill Laboratories

It refers to specifically equipped practice rooms functioning as training facilities offering hands on training for the practice of clinical skills within non-threatening environment prior to their real- life application. This applies to both basic clinical skills as well as complex surgical skills.

Significance of its usage

- Controlled, anxiety-free, and risk-free learning environment to students.
- A platform for repeated practice for mastery in relevant clinical skills
- Increase the preparedness of student learners before transitioning to the real hospital setting.
- Build strong communication skills
- Enable learners to make critical decisions.

Assessment policy

Statutes

1. 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, Behavioural Sciences, Community Medicine & Public Health, Pathology, Pharmacology & Therapeutics, Islamic Studies/ Civics 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 four papers in the second professional examination:

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' examination in each paper will carry 175 marks each, making the total marks of 350 for each of the papers 1, 2 and 3 (Inclusive of internal Assessment).

6. Total Marks for Second Professional Examinations shall be 1050. 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 Prof. 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 contents 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 of the both years include Behavioral Sciences, Community Medicine & Public Heath, Pathology, Pharmacology & Therapeutics, Clinical Foundation – I & ii and PERLs I & II.

10. Written Examination

i. The written document of papers 1, 2 and 3 will consist of Óne- best- type' Multiple Choice Questions (MCQ) and structured Essay Questions (SEQ) in a ratio of 65:35 %.

ii. Each MCQ will have five options (one best response and four distractors) and will carry one (01) mark.

iii. There will be no negative marking.

iv. There will be no sections within a SEQ, and it will be structured question with five (05) marks each.

v. SEQ's will only be based on major content areas of the year.

vi. There will be total of 90 MCQs and 10 SEQs in every written paper in Papers 1, 2 and 3.

vii. The duration of each written paper will be 195 minutes (03 hours & 15 min).

viii. The MCQ section will be of 95 minutes duration and the SEQ section of 100 minutes.

11. Oral/ Practical/ Clinical Examination

a. The 'Oral/Practical/Clinical' component of each paper 1, 2 and 3 will consist of a total of sixteen (16) OSPE/OSCE/OSVE stations in each

'Oral/Practical/Clinical' examination.

b. There will be eleven (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, based on 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 with 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 station from C-FRC1 and PERLs-1 will carry five (05) marks.

g. Each OSVE station will carry fourteen (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 six (06) minutes.

12. Every candidate shall take the examination in the following Blocks (Modules) in Second Professional MBBS Examinations:-

I. Block 4 (Gastrointestinal Tract & Nutrition-1 + Renal -1) Marks 350

II. Block 5 (Endocrinology & Reproduction-1 + Head & Neck, special senses) Marks 350

III. Block 6 (Neurosciences-1) Marks 350

Islamic Studies/ Civics + Pakistan Studies Marks 100

Block- 5 (Endocrinology & Reproduction-I + Head & Neck, Special Senses)

The examination of Block 5 shall be as follows:

I. One written paper of 140 marks having two parts:

   i. Part I shall have eighty-five 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.

   ii. Part II shall have seven 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 duration of each 'Oral/Practical/Clinical' examination will be 100 minutes. Time for each OSPE, OSCE and OSVE stations will be six (06) minutes.

IV. The continuous internal assessment through 'Block Examination', conducted by the college of enrollment shall carry 70 marks, i.e., 20% of the total allocated marks (350) for the block. The score will be equally distributed to the written and 'Oral/Practical/Clinical' Examinations.

13. The marks distribution is given Table 1:

Table 1

Block -5 **Modules** (Endocrinology & Reproduction-I + Head & Neck, Special Senses)	Part I MCQs (90)	90 Marks	Practical/ Clinical Examination	11 OSPE 02 OSCE 03OSVE	Marks 88 10 42	**350**
	Part II SEQS (10)	50 Marks				
	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	**175**	**Total**	**175**		

14. No grace marks shall be allowed in any examination or practical under any guise or name.

15. At least 25% MCQs & 25% SEQs shall be based on applied/clinical/case scenario to assess high order thinking in the papers set for the students of Second Professional MBBS Examinations.

RULES & REGULATIONS

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 & eligible as per all prerequisites of the examination.

c. Has his/her marks of internal assessment in all the Blocks sent to the Controller of Examinations by the Principal of the College along with the admission form.

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 85% of the full course of lectures delivered and practical conducted in the particular academic session, in each block, as well as in the aggregate;

   iii) Certificate of having appeared at the Block Examinations conducted by the college of enrolment with at least 50% cumulative percentage in aggregate of blocks 1, 2, and 3 for the first year and blocks 4,5 and 6 for the second year;

   iv) Candidates falling short of attendance requirement shall not be admitted to the annual examination but may be permitted to appear at the supplementary examination if they make up the deficiency up to the commencement of the next examination by remaining on the rolls of a College as regular student, subject to fulfillment of all other mandatory requirements to appear at the examination.

2. The minimum number of marks required to pass the professional examination for each paper shall be fifty five percent (55%) in Written and fifty percent (55%) in the 'Oral/Practical/Clinical' examinations and fifty percent (55%) 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 atleast 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 papers of the Professional Examination as a whole at one and the same time.

4. A candidate failing in one or more paper of annual examination shall be provisionally allowed to join the next professional class till the commencement of supplementary examinations. Under no circumstances, a candidate shall be promoted to the next professional class till he /she has passed all the papers in the preceding 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 each 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:

a. 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 for remedial classes and re-sit examination.
b. 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.
c. The students can appear in remedial classes / re-sit of a block examination, 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.
    i. 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.

ii. The students who have attained a cumulative attendance of 85% directly or with remedial classes, can appear in the 'annual' professional examination.

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 sickness / death of an immediate relative/being afflicted by a natural/man- made 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 department/s in their colleges.

12. The candidates shall pay their fee through the Principal of their respective Colleges who shall forward a bank draft / pay order / crossed cheque I favor of Treasurer, 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.

LEARNING SOURCES

Anatomy

- 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

- Guyton AC and Hall JE. Textbook of Medical Physiology. W. B. Sunders & Co., Philadelphia 14th Edition.
- Essentials of Medical Physiology by Mushtaq Ahmed

Biochemistry

- 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.

Pathology

- 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.

General Medicine

- Principles and Practice of Medicine by Davidson (latest edition)
- Clinical Medicine by Parveen J Kumar & Michaell Clark
- Oxford Handbook of Medicine
- Macleod's Clinical Examination book

- Medicine and Toxicology by C.K. Parikh
- Hutchison's Clinical Methods by Michael Swash. 21st edition

Pharmacology & Therapeutics

- Katzung and Trevor's Pharmacology: Examination and Board Review- 15th Edition
- Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 16th Edition-
- Current Medical Diagnosis and Treatment- reference book –Edition-2024
- Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 15th Editio
- Basic and Clinical Pharmacology by Katzung, McGraw-Hill. 16th Edition.
- Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins 8th Edition.
- Katzung Basic and Clinical pharmacology, Lippincot Illustated reviews.
- Clinical Pathology Interpretations by A. H. Nagi

Behavioral Sciences

- Handbook of Behavioural Sciences by Prof. Mowadat H.Rana, 3rd Edition
- Medical and Psychosocial aspects of chronic illness and disability 6th edition by Donna R.Falvo and Beverely E.Holland,
- Integrating behavioral sciences in healthcare, Asma Humayun,2003, 1st edition

Community medicine

- Parks Textbook of Preventive and Social Medicine. K. Park
- Public Health and Community Medicine by Ilyas Ansari
- MSDS manual of Government of Punjab
- Textbook of Community Medicine by Park J E. Latest Edition

Surgery

- Bailey and Love's short practice of surgery
- Browse's Introduction to the Symptoms & Signs of Surgical Disease 4th Edition
- Bailey & Love Short Practice of Surgery, Clinical Surgery pearls by Dayananda Babu

RACS for Surgical Audits.

Radiology

- Levinson's review of Microbiology
- Medical Microbiology and Immunology by Levinson and Jawetz,

Gynecology

- Gynecology by Ten Teachers