



LAHORE
MEDICAL & DENTAL
COLLEGE

STUDY GUIDE

BLOCK-5

**(ENDOCRINOLOGY & REPRODUCTION -1,
HEAD AND NECK, SPECIAL SENSES MODULES)**





Mission of LMDC

The Lahore Medical & Dental College is committed in its pursuit of excellence to providing the best academic facilities and atmosphere to its students.

Our Mission is to:

“Train future leaders of medicine who set new standards in knowledge, care and compassion”

The well qualified and committed faculty of LMDC provides combination of nurturing support and challenge to the students to reach their maximum potential.

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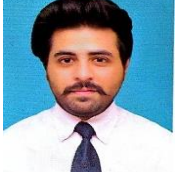
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LIST OF ABBREVIATIONS

A	Anatomy
Ag	Aging
B	Biochemistry
BhS	Behavioral Sciences
C-FRC	Clinical Foundation Rotation Clerkship
CM	Community Medicine
CNS	Central Nervous System
DNA	Deoxy Ribonucleic Acid
MBBS	Bachelor of Medicine, Bachelor of Surgery
MoA	Mechanism of Action
P	Physiology
Pa	Pathology
PCR	Polymerase Chain Reaction
PERLs	Professionalism, Ethics, Research, Leadership
Ph	Pharmacology
RFLP	Restriction Fragment Length Polymorphism
RNA	Ribonucleic Acid
WHO	World Health Organization

DEPARTMENTAL FACULTY & STAFF HEIRARCHY

Anatomy Department

Sr. No.	Picture	Name, Designation and qualification
1		Prof. Dr. Iffat Badar Professor & HOD MBBS, M.Phil.
2		Dr. Anis Fatima Associate Professor MBBS, M.Phil.
3		Dr. Shamaila Ejaz Assistant Professor MBBS, M.Phil.
4		Dr. Samia Shahbaz Assistant Professor MBBS, M.Phil.
5		Dr. Mishal Amjad Demonstrator MBBS
6		Dr. Zovera Khalid Demonstrator MBBS
7		Dr. Mahzaib Haider Demonstrator MBBS
8		Dr. Hamza Safdar Demonstrator MBBS
9		Dr. Afiq Khan Demonstrator MBBS

10		Dr. Ahmad Munawar Demonstrator MBBS
11		Dr. Sheharyar Ahmad Demonstrator MBBS
12		Dr. Junaid Mazhar Demonstrator MBBS
13		Dr. Dua Azhar Demonstrator MBBS

SUPPORTING STAFF

1. Humayun Sarfaraz (Museum Keeper)
2. M. Ismail Khan (Lab. Assistant)
3. Muhammad Imran (Lab. Assistant)
4. Waseem Sibtain (Lab. Assistant)
5. Amjad Hussain (Office Boy)
6. Tariq Ali (Lab. Attendant)
7. Arif Masih (Embalmer)

Physiology Department

Sr. No.	Picture	Name, Designation and qualification
1		Prof. Dr. Anser Asrar Professor & HOD MBBS, M.Phil., FCPS
2		Prof. Dr. Zaima Ali Professor MBBS, M.Phil., Ph.D, CHPE
3		Prof. Dr. Sadia Nazir Professor MBBS, M.Phil., CHPE, Ph.D (Scholar)
4		Prof. Dr. Attiqah Khalid Professor MBBS, M.Phil., CHPE, Ph.D (Scholar)
5		Dr. Asma Akram Assistant Professor BDS, M.Phil., CHPE
6		Dr. Zulfiqar Akram Senior Demonstrator BDS, M.Phil., CHPE
7		Dr. Arooj Fatima Demonstrator MBBS
8		Dr. Hafsa Imran Demonstrator MBBS
9		Dr. Hassnat Ahmed Demonstrator MBBS

10		Dr. Maha Sakhawat Demonstrator MBBS
11		Dr. Meeran Iftikhar Demonstrator MBBS
12		Dr. Rohail Sani Demonstrator MBBS
13		Dr. Yusha Mansha Demonstrator MBBS
14		Dr. Shoaib Shafique Demonstrator MBBS

SUPPORTING STAFF

1. Mr. M. Ashraf (Lab technician)
2. Mr. Akmal Raza (Lab assistant)
3. Mr. Noor-ul-Hassan (Lab attendant)
4. Mr. Ashfaq (Naib Qasid)

Biochemistry Department

Sr. No.	Picture	Name, Designation and qualification
1		Prof. Dr. Rubina Bashir Professor & HOD MBBS, M.Phil.
2		Prof. Sobia Imtiaz Professor MBBS, M.Phil., MHPE
3		Dr. Mahwish Shahzad Associate Professor MBBS, M.Phil., CHPE
4		Dr. Sana Sarmad Associate Professor MBBS, M.Phil.
5		Dr. Madeeha Mushtaq Senior Demonstrator MBBS, M.Phil.
6		Dr. Maryam Saeed Demonstrator MBBS
7		Dr. Iqra Sarwar Demonstrator MBBS
8		Dr. Zain Atta Demonstrator MBBS

9		Dr. Momin Ali Demonstrator MBBS
10		Dr. Fahad Faisal Demonstrator MBBS
11		Dr. Afeera Talib Demonstrator MBBS
12		Dr. Gul Siera Demonstrator MBBS

SUPPORTING STAFF

1. Mr. Saqib Bashir (Lab technologist)
2. Mr. M. Ahmed (Lab assistant)
3. Mr. Ghulam Dastagir (Lab assistant)
4. Mr. Ali Raza (Lab attendant)
5. Mr. Abdul Qayyum (Office boy)
6. Mr. Waqas Javed (cleaner)

Pathology Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Shazia Nilofar Professor & HOD MBBS, M.Phil., MHPE
2		Dr. Saadia Chaudhary Professor MBBS, M.Phil., MHPE
3		Dr. Nazia Ahmad Associate Professor MBBS, M.Phil. , CHPE
4		Dr. Sonia Tahir Associate Professor MBBS, M.Phil. , CHPE
5		Dr. Maimoona Aslam Assistant Professor MBBS, M.Phil. , CHPE

Community Medicine Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Seema Daud Professor & HOD MBBS, MHPE, FCPS, Ph.d
2		Prof. Dr. Humayun Mirza Professor MBBS, MPH, CHPE
3		Dr. Umbreen Navied Associate Professor MBBS, M.Phil., CMT
4		Dr. Saadia Maqbool Assistant Professor MBBS, DMCH, M.Phil., CHPE

Pharmacology Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Ajaz Fatima Professor & HOD MBBS, M.Phil., Ph.D (Scholar)
2		Dr. Asia Firdous Associate Professor MBBS, M.Phil.
3		Dr. Ghulam Ovais Qarni Senior Lecturer MBBS, M.Phil. (Part -1)
4		Dr. Amina Zubair Demonstrator MBBS, M.Phil. (Part-1)

Psychiatry & Behavioral Sciences Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Maqbool Ahmad Khan Professor & HOD MBBS, FCPS
2		Mr. Ebrahim Naeem Demonstrator MS. Clinical Psychology
3		Dr. Tehreem Imtiaz Demonstrator MBBS

Medical Education Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Nighat Nadeem Professor & HOD MBBS, MME

Medicine Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Shamail Zafar Professor & HOD MBBS, FCPS, FACG
2		Prof. Dr. Sarah Shoaib Professor MBBS, FCPS, CMT, CME

Surgery Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Saquib Zahur Professor & HOD MBBS, FCPS
2		Dr. Sidra Shoaib Associate Professor MBBS, FCPS

Gynecology & Obstetrics Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Fozia Umer Qureshi Professor & HOD MBBS, FCPS, CMT, CME, Dip Gynaecological Laparoscopy, MS. Gynae-Oncology
2		Dr. Nabiha Iqbal Assistant Professor MBBS, FCPS
3		Dr. Humaira Rasheed Assistant Professor MBBS, FCPS, MRCOG

Otorhinolaryngology Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Athar Adnan Uppal Professor & HOD MBBS, FCPS

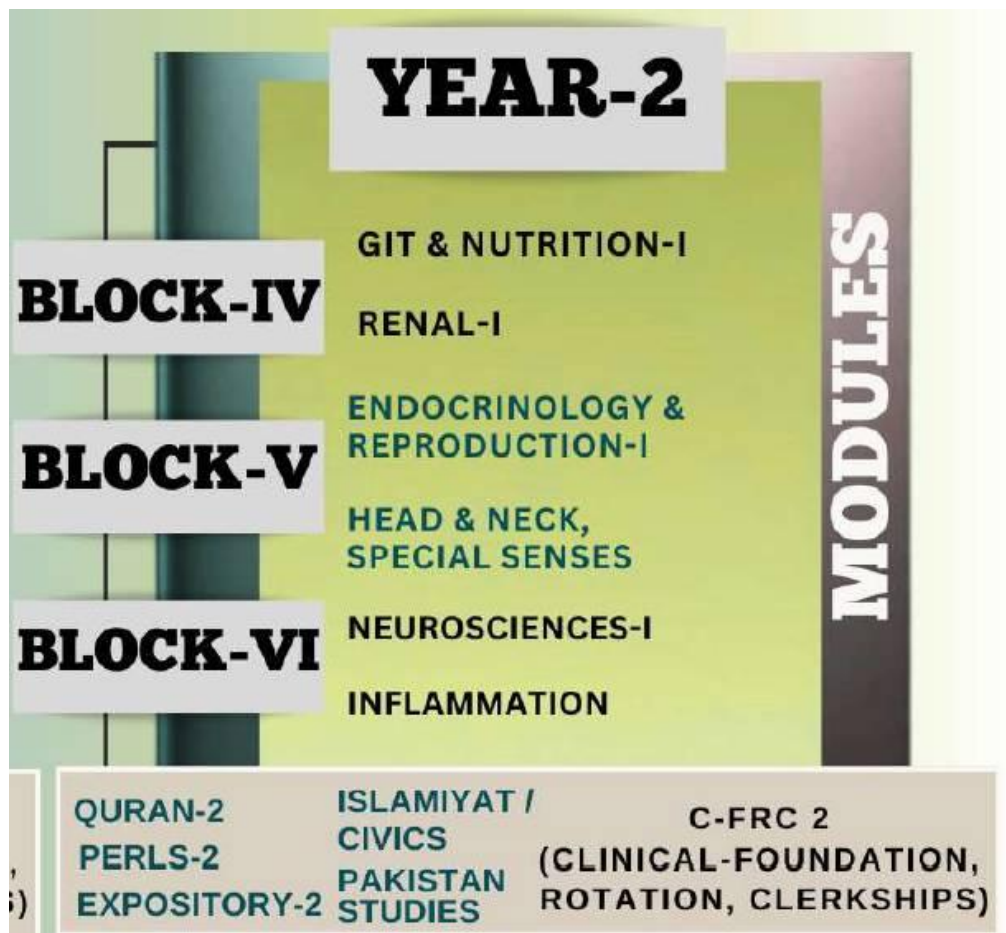
Radiology Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Khalid Farooq Professor & HOD MBBS, FCPS
2		Dr. Muhammad Ali Rauf Registrar Radiology MBBS, PGR

Ophthalmology Department

Sr. No.	Picture	Name, Designation and Qualification
1		Prof. Dr. Mian M. Shafique Professor & HOD MBBS, MS (Ophth), FRCS, MHPE, Fellowship in Pediatric Ophthalmology
2		Prof. Dr. Muhammad Khalil Professor MBBS, FCPS
3		Dr. Muhammad Moeen Bhatti Associate Professor MBBS, FCPS

CURRICULUM FRAMEWORK



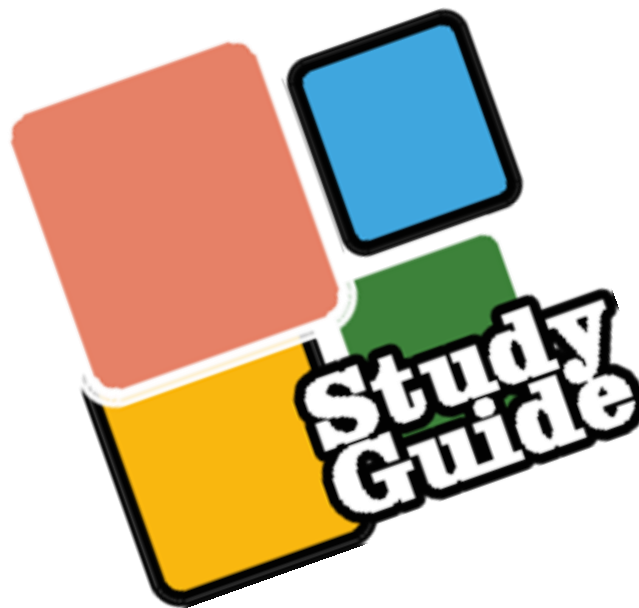
INTRODUCTION TO STUDY GUIDE

What is study guide?

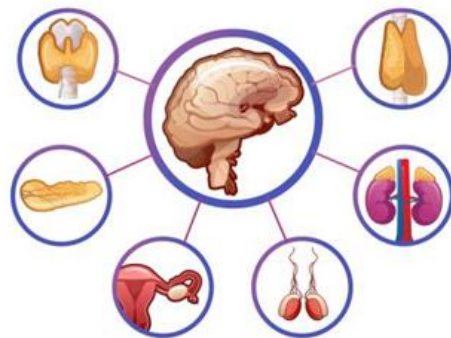
The study guide is an important academic tool that aids students for different educational activities they are engaged in. It provides pertinent details on the module's structure, assisting students in planning their academic activities accordingly. Another purpose of study guide is to guide students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



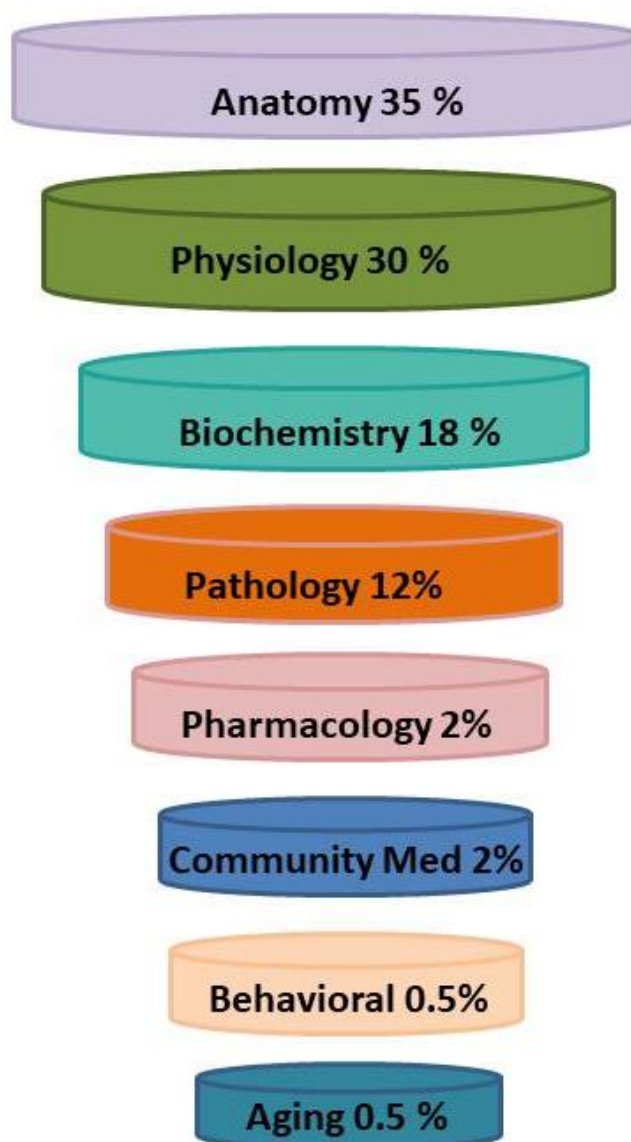
ENDOCRINOLOGY & REPRODUCTION-1 MODULE



INTRODUCTION TO MODULE

Program	MBBS
Year	Two
Module No.	08
Module Title	Endocrinology & Reproduction - 1 Module
Module weeks	6
Recommended minimum hours	214

Integrated Disciplines of Endocrinology & Reproduction - 1 Module



. ENDOCRINOLOGY & REPRODUCTION-1 MODULE COMMITTEES

Module coordinator

- Anatomy (Prof. Dr. Iffat Badar)

Module co-coordinator

- Anatomy (Dr. Shamaila Ejaz)

Representatives

- Physiology (Prof. Dr. Anser Asrar, Prof. Dr. Sadia Nazir)
- Biochemistry (Prof. Dr. Rubina Bashir, Prof. Dr. Sobia Imtiaz)
- Pathology (Prof. Dr. Shazia, Dr. Maimoona)
- Community Medicine (Prof. Dr. Seema Daud, Prof. Dr. Humayun Mirza)
- Pharmacology (Prof. Dr. Ajaz Fatima, Dr. Amna Zubair)
- Behavioral Sciences (Prof. Dr. Maqbool Ahmad Khan)
- Medical Education (Prof. Dr. Nighat Nadeem)
- Gynaecology & obstetrics (Prof. Dr. Fozia Umber Qureshi, Dr. Nabiha Iqbal)
- Radiology (Prof. Dr. Khalid Farooq, Dr Ali Rauf)
- Medicine (Prof. Dr. Shamail Zafar, Prof. Sarah Shoaib)
- Surgery (Prof. Dr. Saquib Zahur, Dr. Sidra Shoaib)

SUBJECT WISE TIME ALLOCATION

Subject	Time allocated (Hours)	Discipline
Anatomy		Anatomy
Gross Anatomy	35	
Embryology & post natal development	14	
Microscopic structure	14	
Histology Practical	11	
Medical Physiology		Physiology
Theory	60	
Practical	4	
Medical Biochemistry		Biochemistry
Theory	32	
Practical	6	
Pathophysiology & Pharmacotherapeutics		
Theory + Practical	12 + 15	Pathology
	2 + 2	Pharmacology & Therapeutics
Disease prevention & Impact		
Theory	5	Community medicine & Public Health
	1	Behavioral Sciences
Aging	1	Gynae/OBS

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

LEARNING OBJECTIVES

THEORY			
NORMAL STRUCTURE			
CODE	GROSS ANATOMY	TOTAL HOURS = 35	
	LEARNING OBJECTIVES	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	Anatomy	Prostate
EnR-A-006	Describe the anatomical basis and manifestations of the following conditions: 1) Hydrocele of spermatic cord and/or testes	Anatomy	Testis clinical conditions

	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		
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	Anatomy	

	mobility in late pregnancy		
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
	Tabulate the origin, course, distribution and anastomosis of arteries of the pelvis	Anatomy	

EnR-A-022	Describe the origin, root value, course, relations, branches and distribution of Pelvic nerves	Anatomy	Pelvic vessels & pelvic nerves
	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 Calculi, 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	Anatomy	

	2. Vaginal trauma 3. culdocentesis		
	Describe, identify, justify and demonstrate the supports of uterus		
EnR-A-024	Describe the gross anatomical features of boundaries & divisions of perineum	Anatomy	Perineum
	Draw and label the boundaries of perineum	Anatomy	
	List the contents of perineum	Anatomy	
	Tabulate the differences between the male and female perineum	Anatomy	
	Describe the attachments of the perineal membrane and list its relations	Anatomy	
	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 9) Disposition Of Uterus	Anatomy	Pelvis

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 adapted for breast examination and mammography	Integrate with Radiology	
CODE	EMBRYOLOGY & POST-NATAL DEVELOPMENT	TOTAL HOURS = 14	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
EnR-A-027	Describe 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
	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	Explain the Development and descent of ovaries	Anatomy	Development of Reproductive system
	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	
	Development of mammary gland. Describe related clinical anomalies	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 Bicornis 4) Uterus Bicornis Unicollis 5) Uterus Unicornis 6) Atresia of vagina 7) Double vagina 8) Imperforate hymen	Anatomy	
	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	
CODE	MICROSCOPIC STRUCTURE (HISTOLOGY & PATHOLOGY)	TOTAL HOURS = 14	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
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	
	Describe the light microscopic structure of Adrenal Gland	Anatomy	Adrenal gland

EnR-A-038	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 gland
	Describe the lobes of prostate and correlate with the pathologies of prostate	Anatomy pathology	
	Describe the light microscopic structure of ovaries	Anatomy	

EnR-A-046	Describe the light microscopic structure of ovarian follicles in different stages of menstrual cycle.	Anatomy	Ovaries
	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
NORMAL FUNCTION			
CODE	MEDICAL PHYSIOLOGY	TOTAL HOURS = 60	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
	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		

EnR-P-001	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.	Physiology	Hypothalamus / Pituitary gland

	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.		
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	Physiology	Thyroid gland

	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		
EnR-P-004	Name the hormones of adrenal cortex. Explain the physiological anatomy of adrenal cortex. Explain the cellular mechanism of Aldosterone action. Explain the effects of mineralocorticoid hormone. Discuss the regulation of aldosterone secretion. Discuss the metabolic and non-metabolic functions of cortisol Explain the interconversion of active cortisol and inactive cortisone by the 2, 11 beta hydroxysteroid dehydrogenase isoform. Explain the mechanism for regulation of glucocorticoid secretion by hypothalamus and pituitary Name adrenal androgens and enlist the functions of adrenal androgens. Discuss the causes, features, pathophysiology and treatment of hypoadrenalism (Addison's disease). Enlist the causes of hyperadrenalism. Explain the features, pathophysiology and treatment of Cushing's syndrome. Differentiate between Cushing's syndrome and Cushing's disease Explain the clinical importance of	Physiology	Adrenocortical hormones

	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		
EnR-P-005	Enumerate the types of pancreatic cells with their hormones. Explain the mechanism of action of insulin. Discuss the synthesis and mechanism of release of insulin. Explain the effects of insulin on carbohydrate, protein and lipid metabolism. Enlist the actions of insulin on liver, adipose tissue and skeletal muscle. Enlist the factors and conditions that increase or decrease insulin 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	Physiology	Pancreatic hormones
EnR-P-006	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	Physiology	Abnormalities of Glucose regulation

	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		
EnR-P-007	Discuss the physiological anatomy of parathyroid gland Explain the rapid and slow mechanism of resorption of bone by parathyroid hormone Discuss the actions of parathyroid Explain the control of parathyroid secretion by calcium ion concentration	Physiology	Parathyroid hormones
EnR-P-008	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-009	Enlist the functions of adrenal medullary hormones and explain pheochromocytoma	Physiology	Adrenomedullary hormones
EnR-P-010	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	Physiology	Spermatogenesis (capacitation & acrosome reaction)

	Explain the phenomenon of capacitation and its significance Describe the acrosome Reaction and its significance Discuss the role of pineal gland in reproduction		
EnR-P-011	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-012	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	Female sexual hormones
EnR-P-013	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	

EnR-P-014	Explain the physiological basis of puberty, menarche Define menopause Explain the cause of menopause Discuss the physiological changes in the function of the body at the time of menopause	Physiology	Puberty, menarche & menopause
EnR-P-015	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-016	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
EnR-P-001	Describe the circulatory and respiratory changes at birth	Physiology	Neonatal Physiology
MEDICAL BIOCHEMISTRY			
CODE	LEARNING OBJECTIVES	TOTAL HOURS = 32	
		DISCIPLINE	TOPIC
EnR-B-001	Describe the features of Signal transduction Describe different types of receptors	Biochemistry	Signal Transduction
EnR-B-002	Discuss the classification of hormones	Biochemistry	Classification of hormones
	Describe different types of second messengers Differentiate the G protein and		

EnR-B-003	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) Discuss the hormones which act through calcium phosphoinositol Describe the Receptor tyrosine kinase pathway of signal transduction Explain the Serine threonine kinase pathway of signal transduction Discuss the Nuclear Receptor mediated pathway of signal transduction Describe the Receptor coupled to Jak Stat pathway of signal transduction	Biochemistry	Second messengers
	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-004	Explain the synthesis, secretion, transport and clearance of steroid and protein hormones.	Biochemistry	Synthesis of Hormones
EnR-B-005	Enlist the steps in the synthesis of adrenocortical hormone. Explain the synthesis and secretion of ACTH (Adrenocorticotrophic hormone) in association with melanocyte-stimulating hormone, lipotropin, and	Biochemistry	Synthesis of ACTH & adrenocortical

	endorphin.		
EnR-B-006	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-007	Discuss the role of steroid hormones in oral contraception, Infertility	Biochemistry	Steroid in infertility
EnR-B-008	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-009	Discuss the structures of genes, how they are organized and regulated.	Biochemistry	Genes
EnR-B-010	Describe Mendelian Law of Segregation and Law of Independent Assortment.	Biochemistry	Mendelian laws
EnR-B-011	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-012	Interpret genetic symbols as they appear in pedigrees.	Biochemistry	Pedigrees
EnR-B-013	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	Biochemistry	Mode of inheritance

	Pigmentosum) 4) Autosomal dominant (Huntington's Disease) 5) Mitochondrial disorder (Mitochondrial diabetes)		
EnR-B-014	Discuss different structural and numerical chromosomal abnormalities.	Biochemistry	Chromosomal abnormalities
EnR-B-015	Interpret the normal human karyotype in terms of number and structure of chromosomes.	Biochemistry	Karyotypes
EnR-B-016	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-017	Discuss the concept of central dogma from gene to protein (replication, transcription and translation)	Biochemistry	Central dogma (Overview)
EnR-B-018	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-019	Describe in detail all the steps in Eukaryotic DNA replication with emphasis on differences between pro- and Eukaryotes	Biochemistry	Eukaryotic DNA replication
EnR-B-020	Discuss telomeres and telomerase and their clinical significance		Telomeres and telomerase
EnR-B-021	Describe DNA repair, mutation and cancers		DNA Repair
	Interpret Xeroderma pigmentosa on basis of sign/symptoms and data		
EnR-B-022	Explain the transcription in prokaryotes focusing on the following key points; RNA polymerase, its components and functions,		Transcription in prokaryotes

	Initiation, elongation and termination of transcription.		
EnR-B-023	Illustrate the transcription in eukaryotes focusing on the differences between pro- and eukaryotic replication		Transcription in Eukaryotes
EnR-B-024	Discuss post transcriptional modifications		Post transcriptional modifications
EnR-B-025	Describe the role of Wobble hypothesis in codon recognition by tRNA		Wobble hypothesis
EnR-B-026	Interpret the translation focusing on the following key points: Initiation, elongation and termination	Biochemistry	Translation
EnR-B-027	Describe Post-translational modification of proteins		Post-translational modification
	Illustrate RNA dependent synthesis of RNA and DNA		
EnR-B-028	Discuss the gene expression especially Lac operon and Tryptophan operon	Biochemistry	Gene Expression
	Discuss the regulation of eukaryotic gene expression with special emphasis on iron metabolism and RNA interference		
EnR-B-029	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

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS			
CODE	LEARNING OBJECTIVES	TOTAL HOURS = 02	
		DISCIPLINE	TOPIC
EnR-Ph-001	Classify drugs that mimic or inhibit hypothalamic and pituitary hormones Explain their mechanism of action Enumerate their clinical uses and potential adverse effects	Pharmacology	Hypothalamic and pituitary hormones
EnR-Ph-002	Classify drugs that mimic or inhibit gonadal hormones and explain their mechanism of action Enumerate their clinical uses and potential adverse effects		Gonadal Hormones
PATHOLOGY			
CODE	LEARNING OBJECTIVES	TOTAL HOURS = 12	
		DISCIPLINE	TOPIC
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
EnR-Pa-010	Enumerate causes of lower genital tract infections and PID's along with lab investigations Enumerate causes of infertility in females along with hormonal investigations Causes of dysfunctional uterine bleeding with histopathological features Pathophysiology and lab diagnosis of eclampsia and preeclampsia Causes of placental implantations (ectopic pregnancy)	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

DISEASE PREVENTION & IMPACT			
CODE	COMMUNITY MEDICINE	TOTAL HOURS = 05	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
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.	Community Medicine	Reproductive health
	Enumerate health related problems across a woman’s reproductive lifetime. Explain the components of reproductive health.		
CODE	BEHAVIORAL SCIENCES	TOTAL HOURS = 01	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
	Discuss common sexual dysfunctions and their prevalence, with emphasis on culture bound syndromes.		

EnR-BhS-001	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
CODE	AGING	TOTAL HOURS = 01	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
EnR-Ag-001	Enlist the changes that occur in female body after menopause	Gynae /OBS	Menopause

PRACTICAL			
CODE	HISTOLOGY	TOTAL HOURS = 11	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
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

CODE	PHYSIOLOGY	TOTAL HOURS = 04	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
EnR-P-018	Perform Pregnancy Test (Urine + Blood)	Physiology	Pregnancy Test
	Interpret BetaHCG values to diagnose a normal pregnancy		
EnR-P-019	Diagram/flow chart showing the signs and symptoms of hypothyroidism/ hyperthyroidism		Thyroid
CODE	BIOCHEMISTRY	TOTAL HOURS = 06	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
EnR-B 030	Demonstrate DNA extraction	Biochemistry	DNA
EnR-B-031	Demonstrate Gel Electrophoresis	Biochemistry	Electrophoresis
EnR-B-032	Demonstrate PCR	Biochemistry	PCR
EnR-B-033	Demonstrate ELISA (enzyme-linked immunoassay) to measure concentration of hormones	Biochemistry	ELISA
CODE	PATHOLOGY	TOTAL HOURS = 15	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
EnR-Pa-012	Identify the salient microscopic features of pituitary adenomas	Pathology	Pituitary adenomas
	Identify the salient gross and microscopic features of Multinodular Goiter		
	Identify the salient gross and microscopic features of		

EnR-Pa-013	Diffuse Goiter	Pathology	Thyroid disorders
	Identify the salient microscopic features of i. Hashimoto Thyroid ii. Granulomatous Thyroid iii. Grave's Disease		
	Interpretation of Thyroid Function Tests in thyroid disorders		
EnR-Pa-014	Interpretation of causes of hypercalcemia according to PTH Levels	Pathology	Parathyroid disorders
	Identify the salient morphological features of parathyroid hyperplasia		
EnR-Pa-015	Interpretation of BSF, GTT, and HbA1C to diagnose Diabetes Mellitus	Pathology	Diabetes Mellitus
EnR-Pa-016	Interpretation of lab Tests in diagnosing Cushing syndrome and Addison disease	Pathology	Adrenal disorders
EnR-Pa-017	Discuss lab tests regarding: i. Hyperthyroidism ii. Hypothyroidism iii. Diabetes Mellitus iv. Diabetic ketoacidosis	Pathology	Chemical chemistry scenarios
CODE	PHARMACOLOGY	TOTAL HOURS = 02	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
EnR-Ph-003	Label the diagram/ flowchart showing the synthesis and MOA of hypothalamic, pituitary and gonadal hormones	Pharmacology	Hypothalamic, Pituitary and Gonadal Hormones

TENTATIVE TIMETABLE

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	Break	Anatomy Dissection Dissection Hall	*Pharma/Path Lecture Theater No. 2	**Histo Pract/ Physio Pract ***Biochem Pract/ CFRC Physiology tutorial (A+B+C+D) (E+F+G) (H+I+J)
TUESDAY	Physiology Lecture Theater No. 10	Biochemistry Lecture Theater No. 10	Anatomy Lecture Theater No. 10	Biochemistry Lecture Theater No. 10		Anatomy Dissection Dissection Hall	SDL Lecture Theater No. 2	**Histo Pract/ Physio Pract ***Biochem Pract/ CFRC Physiology tutorial (H+I+J) (A+B+C+D) (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 ***Biochem Pract/ CFRC Physiology tutorial (E+F+G) (H+I+J) (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.
	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
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.

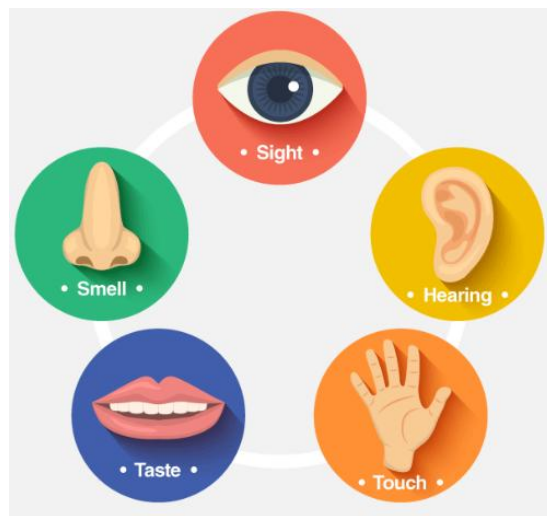
• *Clinical Foundation Rotation Clerkship (CFRC) will be held in Skill Lab/ WARD. In ward time of CFRC, students should be relieved 15 min before time to travel back to LMDC.*

• SDL lecture will be managed by Anatomy/Physiology/Biochemistry

• SDL for 1-hour practical time.

• Expository writing will be managed by Anatomy/Physiology/Biochemistry.

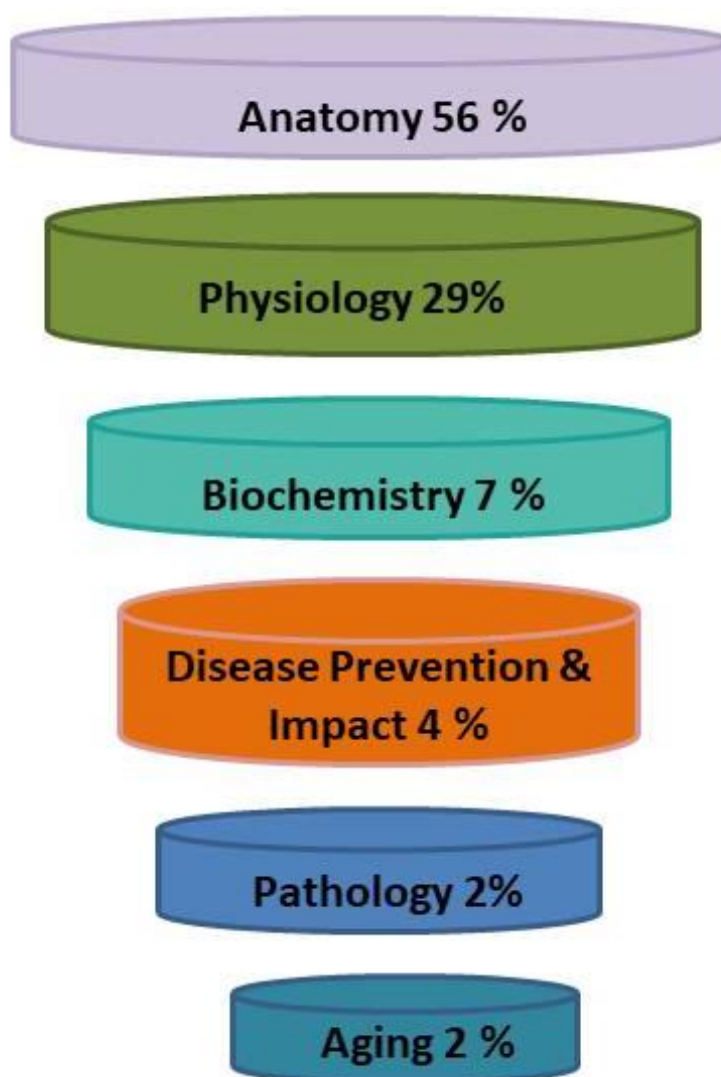
HEAD & NECK, SPECIAL SENSES MODULE



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



ENDOCRINOLOGY & REPRODUCTION-1 MODULE COMMITTEES

Module coordinator

- Anatomy (Prof. Dr. Iffat Badar)

Module co-coordinator

- Anatomy (Dr. Shamaila Ejaz)

Representatives

- Physiology (Prof. Dr. Anser Asrar, Prof. Dr. Sadia Nazir)
- Biochemistry (Prof. Dr. Rubina Bashir, Prof. Dr. Sobia Imtiaz)
- Pathology (Prof. Dr. Shazia, Dr. Maimoona)
- Community Medicine (Prof. Dr. Seema Daud, Prof. Dr. Humayun Mirza)
- Behavioral Sciences (Prof. Dr. Maqbool Ahmad Khan)
- Medical Education (Prof. Dr. Nighat Nadeem)
- Ophthalmology (Prof. Dr. Mian Shafique, Dr. M. Moeen Bhatti)
- Otorhinolaryngology (Prof. Dr. Athar Adnan Uppal)

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

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 them 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
- Rhinitis

LEARNING OBJECTIVES

THEORY			
NORMAL STRUCTURE			
CODE	GROSS ANATOMY	TOTAL HOURS = 56	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
HNSS-A- 001	Define the boundaries and openings of orbital cavity. List orbital contents and structures traversing these openings.	Anatomy	Eye
	In a tabulated manner, list the extra ocular and intraocular muscles of eyeball giving their nerve supply and actions.		
	List and define the movements of eyeball with special reference to orbital and visual axis		
	Describe the functional modalities, course, distribution, branches of oculomotor, trochlear and abducent nerve. Describe the location, roots and distribution of ciliary ganglion.		
	Describe the course and distribution of optic nerve in reference to visual pathway. Give the effects of its lesions		
	Give the clinical correlates of nerves supplying the eyeball and its muscles. Give anatomical justification for Horner's syndrome		
	Describe the course and branches of ophthalmic artery mentioning its origin and termination.		
	Describe the structure of eyelids, conjunctiva and		

	tarsal glands with their neurovascular supply	Anatomy	
	List the parts of Lacrimal apparatus giving their location and anatomical features. Describe the nerve supply of lacrimal gland		
	Describe the location, roots and distribution of pterygopalatine ganglia.		
	Give the anatomical structure of eyeball emphasizing on its three coats and their neurovascular supply		
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	Nose
	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	Ear
	Describe the parts, anatomical features and neurovascular supply of internal ear.	Human Anatomy	
	Describe the course and distribution of vestibulocochlear nerve mentioning the effects of its lesion. Describe auditory pathway.	Human Anatomy	

HNSS-A- 004	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	Tongue
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	
HNSS-A- 006	List the layers of scalp and describe the anatomical features with neurovascular supply and lymphatic drainage of scalp.	Human Anatomy	Scalp
	Give anatomical justification of spread of scalp infections, profuse bleeding in superficial scalp lacerations, gaping of scalp wounds and black eye.	Human Anatomy	
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 of 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 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 the location, roots and distribution of otic and submandibular ganglia.	Human Anatomy	Otic and Submandibular ganglia
HNSS-A- 012	Describe the anatomical features of Hyoid bone and give attachments on the bone.	Human Anatomy	Hyoid bone
HNSS-A- 013	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- 014	List the prevertebral muscles of cervical region. Describe their attachments, actions and innervation.	Human Anatomy	Prevertebral muscles
HNSS-A- 015	Enumerate parts of deep cervical fascia with their respective extents, attachments, relations and contents.	Human Anatomy	Deep cervical fascia
HNSS-A- 016	Describe the facial spaces in head and neck mentioning their communications and their relation to spread of infection.	Human Anatomy	Facial spaces

HNSS-A- 017	Describe the attachments, actions and nerve supply of infrahyoid and suprahyoid muscles of neck.	Human Anatomy	Infrahyoid and suprahyoid muscles
HNSS-A- 018	Describe the location, formation and distribution of ansa cervicalis.	Human Anatomy	Ansa cervicalis.
HNSS-A- 019	Describe the attachments, actions and nerve supply of sternocleidomastoid and trapezius.	Human Anatomy	Sternocleidomastoid and trapezius
HNSS-A- 020	Describe the boundaries and contents of suboccipital, anterior and posterior triangles of neck.	Human Anatomy	Triangles of neck
HNSS-A- 021	Describe the cervical part of trachea and esophagus with their neurovascular supply.	Human Anatomy	Trachea and esophagus
HNSS-A- 022	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- 023	Describe the carotid arteries mentioning their origin, course, branches, distribution and termination.	Human Anatomy	Carotid arteries
HNSS-A-024	Describe carotid body and carotid sinus and give their clinical significance.	Human Anatomy	Carotid body
HNSS-A- 025	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- 026	Name the superficial and deep cervical lymph nodes and give their location and drainage areas	Human Anatomy	Lymphatics
HNSS-A- 027	Describe the location, formation, branches, distribution and lesions of cervical plexus	Human Anatomy	Cervical plexus
	Name the pharyngeal constrictor muscles		

HNSS-A- 028	defining their attachments, innervation and structure traversing the gaps between adjacent muscles.	Human Anatomy	Pharynx
HNSS-A- 029	Name the parts of larynx giving their extent, anatomical features, musculoskeletal framework and neurovascular supply.	Human Anatomy	Larynx
HNSS-A- 030	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	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
HNSS-A- 031	Describe the development of Skull	Embryology	Skull
HNSS-A- 032	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 & Arches
HNSS-A- 033	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- 034	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-	Describe the development of face and nasolacrimal duct and their respective	Embryology	Face and nasolacrimal

035	congenital anomalies.		duct
HNSS-A-036	Describe the development of nasal cavity and paranasal sinuses. Give the associated congenital anomalies.	Embryology	Nose
HNSS-A- 037	Describe the development of larynx	Embryology	Larynx
HNSS-A-038	Describe the development of lip and palate and their associated congenital malformations.	Embryology	Lips and palate
HNSS-A-039	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	
CODE	MICROSCOPIC ANATOMY (HISTOLOGY & PATHOLOGY)	TOTAL HOURS = 08	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
HNSS-A- 040	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- 041	Describe the histological and ultramicroscopic structure of internal ear with special reference to Organ of Corti.	Histology	Ear
NORMAL FUNCTION			
CODE	MEDICAL PHYSIOLOGY	TOTAL HOURS = 30	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
	Define and describe the visual acuity	Physiology	Visual acuity
	Define Emmetropia	Physiology	

HNSS-P- 001	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 Discuss the clinical features of Open Angle and Angle Closure Glaucoma	Physiology	Glaucoma
HNSS-P-005	Describe the physiological anatomy and function of structural elements of retina	Physiology	Retina
	Enlist different layers of retina		
	Explain the significance of melanin pigment in retina		
	Describe macula and foveal region of retina and their significance		
	Describe the structure of rods and cones		
	Comment on the location of optic disc and its significance		
	Describe the cause, features, and treatment of retinal detachment		
	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	
HNSS-P-008	Explain the tricolor mechanism of color determination	Physiology	Color vision
	Define term protanopes, deuteranopes, tritanopes	Physiology	
	Enlist the types of color blindness and their causes	Physiology	
	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	
HNSS-P- 015	Trace the neural pathway for pupillary light reflex	Physiology	Pupillary light reflex
	Explain the pupillary light reflexes or reactions in CNS diseases	Physiology	
	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	
	Explain the mechanism of excitation of olfactory cells, membrane potential and action potential on olfactory cells Discuss the adaptation of the olfactory sensations	Physiology	

	Discuss the transmission of smell signals in the CNS		
HNSS-P- 027	Enlist the causes and clinical features of Rhinitis	Integrate with Otorhinolarygology	Rhinitis
	Differentiate between viral and allergic rhinitis		
CODE	MEDICAL BIOCHEMISTRY	TOTAL HOURS = 7	
	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	
CODE	PATHPHYSIOLOGY AND PHARMACOTHERAPEUTICS	TOTAL HOURS = 03	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
HNSS-Pa-001	Enlist the common causative agents of Eye, Ear infections	Pathology	Eye/Ear infections
	Discuss the pathogenesis and clinical features of common pathogens		
DISEASE PREVENTION & IMPACT			
CODE	COMMUNITY MEDICINE & BEHAVIORAL SCIENCE	TOTAL HOURS = 06	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
HNSS-CM-		Community	

001	Identify factors leading to noise pollution	Medicine/ Otorhinolaryg ology	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
CODE	AGING	TOTAL HOURS = 03	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
HNSS-Ag- 001	Familiarize with the age-related hearing loss	Otorhinolaryngology	Deafness
HNSS-Ag- 002	Discuss the age changes of mandible	Anatomy	Head & Neck

PRACTICAL			
CODE	HISTOLOGY	TOTAL HOURS = 09	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
HNSS-A-042	Draw and label diagrams to show histological structure of serous demilunes, serous and mucous acini.	Histology	Head & Neck
HNSS-A-043	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-044	Draw and label a diagram to show histological structure of internal ear.	Histology	Ear
CODE	PHYSIOLOGY	TOTAL HOURS = 16	
	LEARNING OBJECTIVES	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

CODE	BIOCHEMISTRY	TOTAL HOURS = 05	
	LEARNING OBJECTIVES	DISCIPLINE	TOPIC
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

TENTATIVE TIMETABLE

BLOCK – 5 (HEAD & NECK, SPECIAL SENSES MODULE)

DAYS & TIME	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 11:00 a.m.	11:00 a.m. to 01:00 p.m.	01:00 p.m. to 03:00 p.m.	
MONDAY	Anatomy Lecture Theater No. 10	Physiology Lecture Theater No. 10	* Pathophysiology & Pharmacotherapeutics / Disease Prev & Impact Lecture Theater No. 10	Break	Anatomy Dissection Dissection Hall	Physiology Practical (A+B+C+D) Histology Practical (E+F+G) ** Biochemistry / Physiology Practical (H+I+J)	
TUESDAY	Physiology Lecture Theater No. 10	Anatomy Lecture Theater No. 10	Physiology Lecture Theater No. 10		Anatomy Dissection Dissection Hall	Physiology Practical (H+I+J) Histology Practical (A+B+C+D) ** Biochemistry / Physiology Practical (E+F+G)	
WEDNESDAY	Physiology Lecture Theater No. 10	Anatomy Lecture Theater No. 10	Physiology Lecture Theater No. 10		Anatomy Dissection Dissection Hall	Physiology Practical (E+F+G) Histology Practical (H+I+J) ** Biochemistry / Physiology Practical (A+B+C+D)	
THURSDAY	*** Anatomy / Physiology Lecture Theater No. 10	Biochemistry Lecture Theater No. 10	Physiology Lecture Theater No. 10		11:00 a.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 Dissection Dissection Hall	Physiology Lecture Theatre No. 2	Disease Prev & Impact Lecture Theatre No. 2
FRIDAY	08:00 a.m. to 10:00 a.m.	10:00 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.
	Anatomy Dissection Dissection Hall	Anatomy Lecture Theater No. 10	**** Biochemistry / Aging Lecture Theater No. 2		***** Anatomy / CFRC Lecture Theater No. 2		***** Physiology / Aging Lecture Theater No. 2

CC:-

1. Principal, LMDC
2. Vice Principal, LMDC
3. Heads of All concerned Departments, LMDC/GTTH
4. Chief Administrative Officer / Director F&A, LMDC
5. HOD Medical Education, 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

* 1st four weeks Pathophysiology & Pharmacotherapeutics & last week Disease Prev & Impact.

** 1st two weeks Biochemistry Practical & last three weeks Physiology Practical.

*** 1st three weeks Anatomy & last two weeks Physiology.

**** 1st four weeks Biochemistry & last week Aging.

***** 1st week Anatomy & last four weeks CFRC.

***** 1st four weeks Physiology & last week Aging.

• SDL for 1-hour practical time.

• Expository writing will be managed by Anatomy/Physiology/Biochemistry.

LEARNING METHODOLOGIES

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

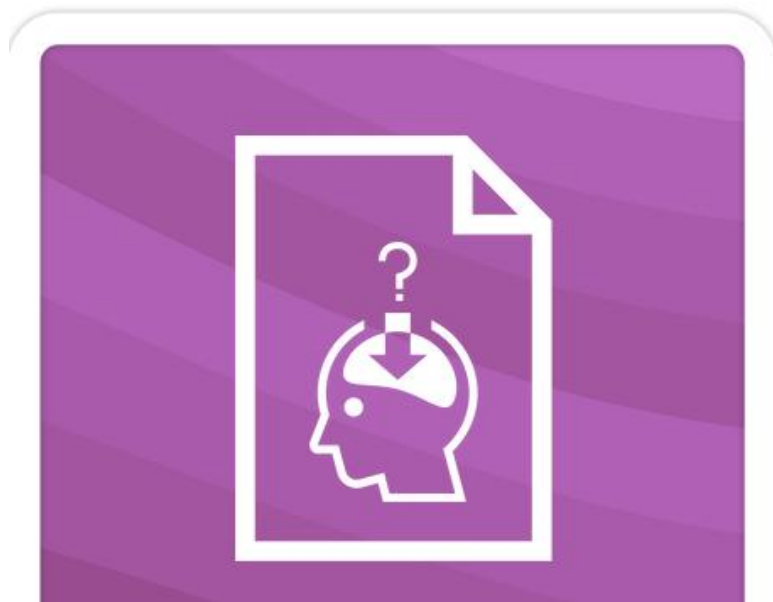
- Provides detailed (rich qualitative) information.
- Provides insight for further research.
- Permitting investigation of otherwise impractical (or unethical) situations.

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

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 & is eligible as per all prerequisites of the examination.
 - c. has his/her marks of internal assessment in all the Blocks/Clinical Clerkships sent to the Controller of Examinations through office of the Principal of the concerned college, at the end of each Block/Clinical Clerkships, as well as at the conclusion of the academic session along with the admission form for the professional examination.
 - d. Has been certified by the principal of his/her college:
 - i. of good character;
 - ii. of having attended not less than cumulative 75%* of the full course of lectures delivered, practical and clinical rotations conducted in the particular academic session, while maintaining 75 % attendance in each Block/Clinical Clerkship,
 - iii. of having appeared at the Block/Clinical Clerkship Examinations conducted by the college of enrolment with at least 50 % marks* in each Block/Clinical Clerkship examination, as well as in aggregate score of all Blocks/Clinical Clerkships examinations for the concerned year;
2. Written/Theory paper in all Professional Examinations in Modular Integrated MBBS or BDS Curricula shall consist of MCQs alone, with effect from Annual 2026 Examinations. (Ref: No. UHS/REG-25/2379, dated 17.11.2025)
3. The minimum number of marks required to pass the professional examination for each Block/Clinical Clerkship shall be fifty percent (50%) in Written and fifty percent (50%) in the 'Oral/Practical/Clinical' examinations and fifty percent (50%) in aggregate, independently and concomitantly, at one and the same time.
4. A candidate failing in one or more Blocks/Clinical Clerkships in the annual examination shall be provisionally allowed to join the next professional class till the commencement of supplementary examinations. The candidate, however, shall have to pass the failed Block/s or Clinical Clerkship in this supplementary examination failing which he / she shall be detained in the professional year. Under no circumstances, a candidate shall be promoted to the next professional class till he/she has previously passed all the Blocks/Clinical Clerkships in the preceding professional examination.

If a student appears in the Supplementary Examination for the first time as he/she did not appear in the annual examination for any reason and failed in any Block/Clinical Clerkship in the Supplementary Examination, he/she will be detained in the same class and will not be promoted to the next class.

5. Only one annual and one supplementary of each Professional Examination shall be allowed in a particular academic session. However, 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.
6. Any student who fails to clear the First or Second Professional MBBS / First Professional BDS Examination, in four consecutive attempts, each, inclusive of both availed as well as un-availed attempts, after becoming eligible for the examination, and has been expelled on that account shall not be eligible for continuation of studies and shall not be eligible for admission as a fresh candidate in either MBBS or BDS.
7. The application for admission of each candidate to the professional examination shall be submitted to the Controller of Examination, through the Principal of the College, on the prescribed format, as per notified schedule, accompanied by the prescribed fee.
8. The candidates shall pay their fee through the principal of their respective Colleges, who shall forward the Examination Forms along with the duly paid challan of the examination fee generated from the Online Examination Form.
9. The continuous internal assessment through the Block/Clinical Clerkship, conducted by the college of enrollment, shall carry 20% weightage in the total allocated marks for the concerned Block/Clinical Clerkship in the Professional Examination conducted by the university. The score will be equally distributed to the Written and “Oral/Practical/Clinical” Examinations.
10. The marks of internal assessment through Blocks/Clinical Clerkships examination and attendance record shall be submitted to Controller of Examinations, along with question papers and keys for the Block/Clinical Clerkship examination, within two weeks of completion of each Blocks/Clinical Clerkships examination.
Further, parent-teacher meetings shall be arranged by the colleges after every Block/Clinical Clerkship examination to share feedback on the progress of students with their parents. Minutes of parent teacher meetings, academic timetables/schedule of Blocks/Clinical Clerkships and academic year study guides shall be submitted to the Department of Medical Education UHS, as well.
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 the colleges.
12. The colleges may arrange remedial classes and one re-sit for each Block/Clinical Clerkship examination after fulfillment of prescribed requirements given below. 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:

Block/Clinical Clerkship Attendance	Remedial Classes
<75%, ≥ 50% (50-74%)	i. Principal of the college may conduct remedial classes and submit result to the Examination Department, UHS, independently. ii. Principal of the college may conduct remedial classes for detained students, who have short attendance in the first Block/Clinical Clerkship of a professional year after detention. The college may submit record of the remedial classes to the Examination Department, UHS, independently.
< 50%	i. Principal of the college may submit attendance record of such students to Department of Medical Education, UHS, and seeking permission for conduct of remedial Classes. The conduct of remedial classes in such cases shall be arranged only after permission from the Competent Authority in the university. ii. The colleges shall also have to provide the university with the reasons submitted by the candidates for short attendance along with documentary evidence for the same duly verified by the principal. iii. The following shall be considered as valid reasons for short attendance of the students for consideration of permission for remedial classes: • 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/Clinical Clerkship of the year), students clearing their preceding professional examination in supplementary, or late admitted students who have been permitted for joining by UHS.

Marks in Blocks/Clinical Clerkship Examination	Re-sit Examination
<50% Marks/ Absence from Block /Clinical Clerkship Examination	i. Principal of the college may submit record of such students to Department of Medical Education, UHS, and seeking permission for conduct of re-sit examination. ii. The conduct of re-sit examination in all cases shall be arranged only after permission from the Competent Authority in the university. iii. The colleges shall also have to provide the university with the reasons submitted by the candidates for absence from the Block/Clinical Clerkship examination, along with documentary evidence for the same duly verified by the principal. iv. The following shall be considered as valid reasons for absence of a student from Block/Clinical Clerkship examination, and for consideration of permission for re-sit examination: • 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/Clinical Clerkship of the year), students clearing their preceding professional examination in supplementary, or late admitted students who have been permitted for joining by UHS.

13. The following policy shall be applicable for transition of students From Traditional Subject-Based Scheme to the Modular Integrated Curriculum Scheme:

- i. The students who fail in all subjects of the professional examination, either by taking the examination or due to non-appearance, and are detained in the respective professional year, shall follow the Modular Integrated Curriculum Scheme for their teaching and assessment.
- ii. The students who fail in one or more subjects but not all the subjects of a professional examination, either by taking the examination or due to non-appearance, and are detained in the respective professional year, shall attend classes with students following the Modular Integrated Curriculum

Scheme, but they will be examined in the failed subject/s according to their parent scheme, i.e., the Traditional Subject-Based Curriculum Scheme.

Assessment Tools

- Written examination: MCQs
- Oral/Practical/Clinical: OSPE, OSCE, Structured Viva (OSVE)

Block - 5 Module (Endocrinology & Reproduction-1 + Head & Neck, Special Senses)	Part I MCQs (140)	140 Marks	Practical/ Clinical Examination	11 OSPE 02 OSCE 03 OSVE	Marks 88 10 42	350
	Internal Assessment 10%	35 Marks	Internal Assessment 10%	35 Marks		
	Total	175	Total	175		

Note:

- Time for 140 MCQS will be 2 hours 30 mins
- Time for each OSPE, OSCE and OSVE station will be six (06) minutes
- No grace marks shall be allowed in any examination or practical under any guise or name

TABLE OF SPECIFICATIONS (TOS)

Block-5

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

LEARNING RESOURCESS



Anatomy

- Clinical Anatomy by Regions – Snell R.S. – 10th ed – Lippincott Williams & Wilkins (Wolters Kluwer) – 2019
- Langman's Medical Embryology – Sadler T.W. – 12th ed – Lippincott Williams & Wilkins (Wolters Kluwer) – 2012
- Medical Histology: Text & Atlas – Siddiqui L.H. – 8th ed – Paramount Books (Karachi)
- Anatomy: Regional and Applied – Last R.J. – 11th ed – Churchill Livingstone (Edinburgh)

Physiology

- Guyton and Hall Textbook of Medical Physiology. John E. Hall & Michael E. Hall – 14th ed – Elsevier – 2021
- Ganong's Review of Medical Physiology – Kim E. Barrett, Susan M. Barman et al. – 27th ed – McGraw-Hill – 2024

Biochemistry

- Harpers illustrated Biochemistry – Rodwell.V.W – 32nd ed – MCGraw-Hill – latest edition
- Lippincott illustrated Reviews: Biochemistry – Wolters Kluwer – 9th edition – 2025
- Essentials of Medical Biochemistry (Vol 1 & 2) – Mushtaq Ahmed – Vol 1, 9th ed – Nishtar Publications – 2019

Pathology

- Robbins & Cotran pathologic basis of diseases – Kumar V., Abbas A.K., Aster J.C. – 11 th ed – Elsevier – 2025
- Pocket companion to Robbins & Cotran Pathologic Basis of Diseases Mitchell R. N., Kumar V., Abbas A.k, Aster J.C. – 10 th ed – Elsevier – 2022
- Review of Medical Microbiology & Immunology-Levinson W. - 18th ed McGraw – Hill -2024

Pharmacology

- Lippincott Illustrated Reviews: Pharmacology-Whalen K.L., Lerchenfeldt S.M., Giordano C.R.- 8th ed- Wolters Kluwer / Lippincott- 2022
- Katzung's Basic & Clinical Pharmacology-Katzung B.G., Vanderah T.W. - 16th ed -McGraw-Hill- 2024

Community Medicine

- Park's Textbook of Preventive and Social Medicine - K. Park - 27th ed - Banarsidas Bhanot Publishers
- Public Health and Community Medicine - Muhammad Irfanullah Siddiqui & Shah Ilyas Ansari-8th

ed - Time Publishers

Behavioural Sciences

- Handbook of Behavioural Sciences - Mowadat H. Rana-3rd ed-2016

Medicine

- Davidson's Principles and Practice of Medicine - 24th ed – Elsevier - 2022
- Kumar & Clark's Clinical Medicine - ParveenKumar & Michael Clark - 9th ed - Elsevier 2017
- ABC of Dermatology - 7th ed - Wiley-Blackwell - 2021 (Dermatology)

Clinical Skills

- Hutchison's Clinical Methods: An Integrated Approach to Clinical Practice - 24th ed - Elsevier- 2022.
- MacLeod's Clinical Examination -15th ed – Elsevier - 2023

Surgery

- Bailey & Love's Short Practice of Surgery - 28th ed - CRC Press - 2023

Obstetrics and Gynaecology

- Gynaecology by Ten Teachers - edited by Ash Monga & Stephen Dobbs -19th ed-CRC Press-2011.
- Obstetrics by Ten Teachers - Louise C. Kenny & Fergus McCarthy (Editors) - 21st ed -CRC Press- 2024

Ophthalmology

- Kanski's Clinical Ophthalmology: A systematic Approach – John F. Salmon – 10th ed – Elsevier
- Parsons' Diseases of the Eye – Ramanjit Sihota & Radhika Tandon – 24th ed – Elsevier

ENT

- Diseases of Ear, Nose & Throat – P.L. Dhingra – 8th ed
- Hall & Colman's Diseases of Ear, Nose & Throat – 15th ed
- Logan Turner's Diseases of Ear, Nose & Throat – 11th ed