Study Guide

2nd Year MBBS

Endocrinology & Reproductive-1

Block 5

Contents

Vision & Mission

Vision & Mission of UHS

Vision statement

UHS is a leading university aiming to keep its graduates apt with the ever-emerging global health challenges evolving educational methodologies and emerging technological advancements tomaintain its distinguishable positions as a Medical University.

Mission statement

UHS shall continue to strive for producing a human resource par and excellence to cater for thehealth needs of the people of Punjab and Pakistan.

Vision & Mission of SMDC

To be recognized for the provision of a safe and functional environment conducive to collaborativeteaching & learning, comfortable working atmosphere and conducting world class research throughprofessionalism and excellence.

'Veritas et Devotio'

Mission

Sharif Medical & Dental College is dedicated to best serving the nation through preservation and dissemination of advanced knowledge and educating the students by latest trends in learning and research reaching levels pars excellence.

The Institution is committed to provide standardized quality medical education to its students by inculcating professional knowledge, skills, and responsibilities in them with the aim of:

- Preparing them as modern physicians having initiative to act as future leaders in their respective fields and becoming lifelong learners.
- Encouraging the spirit of critical thinking through research and publication.
- Building up an understanding of the ethical values compatible with our religion, culture, and social norms.
- Developing a sense of being responsible citizens of society possessing professional competence and instilling in them the values of hard work and dedication thus preparing them to be accountable to the stakeholders and the state.

The Institution is devoted to keep abreast its faculty with the latest trends in Medical Education encompassing teaching/learning methodologies, assessment tools, research opportunities and professionalism to facilitate their professional development, competencies, and commitment towards continues learning.

Our patient-centered mission is achieved by outstanding medical care & services in professional practice with due emphasis and focus on our local health needs.

Our mission further elaborates upon establishing academic and research facilities in areas of local demand under global gold standards and leading advancement in research, education & patient care.

List of Abbreviations

Abbreviations	Subjects
A	Anatomy
ABG	arterial blood gas
Ag	Aging
AKI	acute kidney injury
ALT	alanine transaminase
AMP	Adenosine monophosphate
ANS	Autonomic Nervous System
AST	aspartate aminotransferase
AV	Atrioventricular
B	Biochemistry
BhS	Behavioral Sciences
C	Civics
CBC	Complete Blood Count
C-FRC	Clinical-Foundation Rotation Clerkship
CK	Creatine kinase
CM	Community Medicine
CNS	Central Nervous System
CO	Carbon monoxide
CO2	Carbon dioxide
COPD	Chronic obstructive pulmonary disease
COX	cyclooxygenase
CPR	Cardio pulmonary Resuscitation
CT	Computed tomography
CV	Cardiovascular
CVA	cerebral vascular accident
DALY	Disability-Adjusted Life Year
DCMLS	Dorsal column medial lemniscus system
DLC	differential Leukocyte Count
DNA	Deoxy Ribonucleic Acid
ECF	Extra Cellular Fluid
ECG	Electrocardiography
ECP	Emergency contraceptive pills
EEG	Electroencephalogram

EnR	Endocrinology & Reproduction
ENT	Ear Nose Throat
ER	Emergency Room
F	Foundation
FEV1	Forced Expiratory Volume 1
FM	Forensic Medicine
FVC	Forced Vital Capacity
GFR	Glomerular Filtration Rate
GIT	Gastrointestinal tract
GMP	guanosine monophosphate
GO	Gynecology and Obstetrics
GTO	Golgi Tendon Organ
HCL	Hydrochloric acid
H & E	Hematoxylin and eosin
HL	Hematopoietic & Lymphatic
HMP	Hexose Monophosphate
HNSS	Head & Neck and Special Senses
ICF	Intra Cellular Fluid
IL	Interleukin
IN	Inflammation
INR	International Normalized Ratio
IUD	Intrauterine device
IUGR	Intra Uterine Growth Restriction
JVP	Jugular Venous Pulse
LDH	Lactate Dehydrogenase
M	Medicine
MALT	Mucosa Associated Lymphoid Tissue
MCH	Mean Corpuscular Volume

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

Re	Respiratory
RFLP	Restriction Fragment Length Polymorphism
RMP	Resting Membrane Potential
RNA	Ribonucleic Acid
S	Surgery
SA	Sinoatrial
TCA	Tricarboxylic acid cycle
TNF	Tumor Necrotic Factor
USG	Ultrasonography
UTI	Urinary Tract Infections
WBCs	White Blood Cells

Introduction to study guide

In this phase of your medical education again typically marks a significant transition from the foundational knowledge gained in your first year to more clinical applications and deeper understanding of medical concepts. This study guide will help you to know about the syllabus of the second block of second year is BLOCK 5. Here's an introduction to what you can expect in your second year:

Clinical Clerkships: Second year often involves starting clinical clerkships, where you'll rotate through various specialties. These clerkships provide hands-on experience in different medical settings and specialties, allowing you to apply your knowledge in real-life scenarios and interact with patients under supervision.

Continued Basic Sciences: While the emphasis shifts towards clinical experiences, you'll still engage with basic science courses, albeit at a little more advanced level. These courses may include topics like pharmacology, pathology, microbiology, and physiology, which provide the foundation for more understanding of diseases and their treatment.

Integration of Clinical Skills: You will continue to develop clinical skills such as history-taking, physical examination, communication with patients, and medical decision-making. These skills are essential for becoming a competent physician and will be honed through practice, feedback, and guidance from clinical instructors.

Research and Extracurricular Activities: Dear students conducting research, volunteering, or joining student activities, can enhance your medical college experience and help you grow as a future physician.

Maintaining Balance: Balancing the demands of coursework, clinical skills learning, exam preparation, and personal life can be challenging during your second year.

Overall, the second year of medical school is an exciting and challenging time as you continue to build upon your foundation of medical knowledge, gain clinical experience, and prepare for the next stages of your medical career. Embrace the opportunities for growth, stay focused on your goals, and remember to enjoy the journey.

Block 5

It consists of two modules:

- Endocrinology and reproduction.
- Head and neck, special senses.

We will study in detail the endocrinology and reproduction in your second year of medicine is fundamental to understanding human physiology and health. These subjects delve into the intricate mechanisms of hormonal regulation, reproductive processes, and their implications for overall health and disease.

You're going to learn about head and neck anatomy, physiology, histology, biochemistry, pharmacology, as well as the special senses. The head and neck region of the human body is intricate and houses vital structures such as the brain, eyes, ears, nose, mouth, and throat.

Key Areas of Focus

Anatomy: Understanding the structure of the human body is essential for any aspiring physician. Spend ample time in the cadaver lab and utilize anatomical atlases to reinforce your learning.

Physiology: These include vision (sight), hearing (audition), taste (gustation), smell (olfaction), and balance (equilibrium). Each of these senses involves specialized receptors and neural pathways for detecting and processing sensory stimuli.

Biochemistry: Explore the molecular mechanisms underlying physiological processes. Pay particular attention to biochemical pathways, enzyme kinetics, and metabolic regulation.

Histology: Study the microscopic structure of tissues and organs to comprehend their functions and pathology. Use microscopy slides and digital resources to aid in your understanding.

Integrated lectures

Integrating lectures basic sciences with clinical sciences is a fundamental aspect of medical education in modular curriculum, facilitating a comprehensive understanding of medical concepts and their practical applications in patient care. These integrated lectures bridge the gap between theoretical knowledge and its clinical relevance, offering students a holistic approach to medical education.

PERLs: Affective training has been formally inculcated in the curricular framework. The model of PERLs has been introduced so that the yield of doctors has a strong, resilient, ethically driven character. PERLs stands for Professionalism, Ethics, Research and Leadership skills. PERLs rounds up professional development for the effective application of the knowledge and skills base achieved.

C-F RC-1: In your second year of Clinical Skills- in this block which will represent clinical orientation. The clinical orientation will be conducted in wards, skills labs and simulation centers (depending on the available resources). The clinical orientation along with the applied/clinical component of the knowledge base will channelize the learner for the practical and professional aspect of learning.

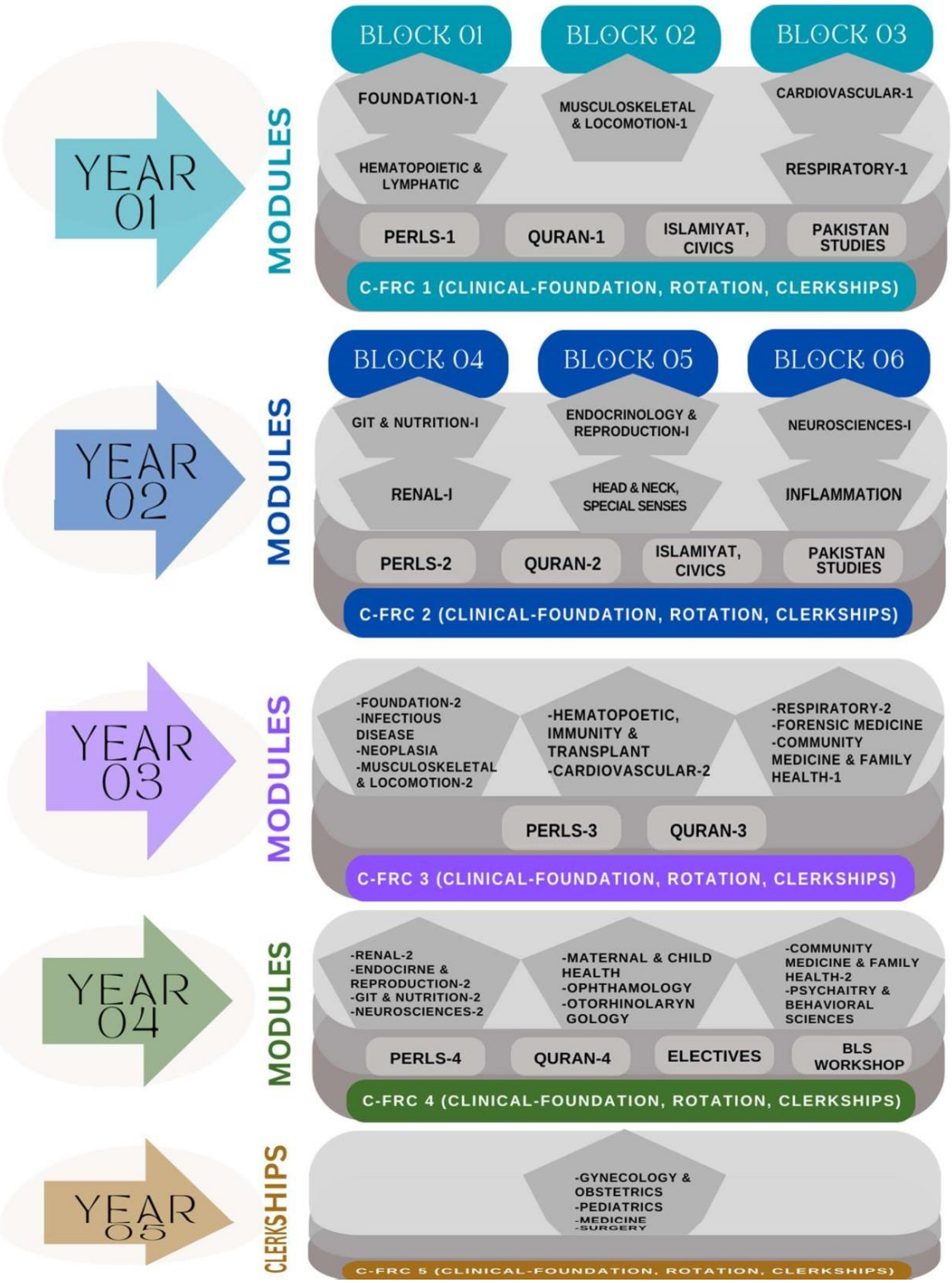
Islamiyat and Pak studies

Both subjects are important in the curriculum as they help students understand their religious and national identity, as well as the values and principles upon which the nation was founded. They provide a foundation for students to develop a sense of citizenship, cultural awareness, and a deeper understanding of their heritage.

Curriculum framework

Curriculum 2K23 *version 2.0*

CURRICULUM FRAMEWORK



Modular Committee

Sr No.	Foundation Module Calendar	Faculty Members
1.	Endocrinology & Reproductive-1	• Prof. Uzma Ahsan, Head, Dept. of Dermatology • Prof. Maria Aslam, Head, Dept. of Pathology • Prof. Samra Hafeez, Dept. of Biochemistry • Dr. Uzma Shahid, Head, Dept. of Medical Education • Prof. Ammara Ghafoor, Dept. of Anatomy • Dr. Sabeen Arjumand , Assoc. Prof. Dept. of Pharmacology • Dr. Amna Iqbal, Assoc. Prof. Dept. of Community Medicine • Dr. Ruksana Zafar, Assist. Prof. Dept. of Gynae & Obs • Prof. Madiha Ehsan, Assist. Prof. Dept. of Pathology • Dr. Sana Javaid, Assist. Prof. Dept. of Physiology • Dr. Hassan Taqi, Assist. Prof. Dept. of Surgery • Miss Saira Shirazi, Dept. of Psychiatry
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MODULE 08
ENDOCRINOLOGY & REPRODUCTION-I

Module rationale

The 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

Syllabus of Endocrinology and Reproduction

NORMAL STRUCTURE				
	THEORY			
CODE	**GROSS ANATOMY**	**TOTAL HOURS = 35**		
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPIC**	**MIT**
EnR-A-001	Describe the location, anatomy blood supply and functions of pituitary gland	Anatomy	Diencephalon Endocrinology	LGIS (Large group interactive session)
EnR-A-002	Describe the Thyroid, Parathyroid with their type, Relations, blood supply, and nerve supply. Explain the anatomical basis for surgical removal of the glands of neck with special emphasis on the complications that can be encountered	Anatomy	Thyroid & Parathyroid gland	LGIS (Large group interactive session)
	Identify the Thyroid with their type, relations, blood supply, and nerve supply.	Anatomy		SGD (Small group discussion)
EnR-A-003	Describe the structure, fascia, coverings, blood and nerve supply of testis	Anatomy	Testis	LGIS (Large group interactive session)
EnR-A-004	Describe the gross anatomical features and neurovasculature of epididymis and vas deferens, Seminal vesicles, Bulbourethral gland	Anatomy	Accessory Male organs	LGIS (Large group interactive session)
EnR-A-005	Describe the morphological features and neurovascular supply of prostate. Correlate the clinical manifestations of prostate with lobes and/or zones of prostate		Prostate	LGIS (Large group interactive session)
	Draw & Label Lobes of prostate gland.			SGD (Small group discussion)

EnR-A-006	Describe the anatomical basis and manifestations of the following conditions: 1) Hydrocele of spermatic cord and/or testes 2) Hematocele of testes 3) Torsion of the spermatic cord 4) Varicocele Vestigial remnants of embryonic genital duct Describe the anatomical basis of vasectomy, & metastasis of cancer of testis and scrotum	Anatomy	Testis clinical conditions	LGIS (Large group interactive session)
EnR-A-007	Describe shape, relations blood supply & nerve supply of suprarenal gland. Explain the anatomical causes of Adrenal Abnormalities	Anatomy	Supra-Renal Gland	LGIS (Large group interactive session)
EnR-A-008	Define Bony Pelvis (Girdle) and describe the structures forming it. Describe the bones and salient anatomical features of Bony pelvis (girdle)	Anatomy	Pelvic Girdle	SGD (Small group discussion)
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	SGD (Small group discussion)
EnR-A-010	List the contents of True and False Pelvis Tabulate the differences between male and female pelvis.	Anatomy	Bony Pelvis (Girdle)	SGD (Small group discussion)
	Describe different types of pelvises Describes different diameters of pelvis and their application in obstetric practice	Anatomy (Obs. & Gynae)		LGIS (Large group interactive session)
EnR-A-011	Describe the anatomical basis of pelvic fractures and their consequences. Describe the topographical anatomy of pelvic walls and its components	Anatomy	Pelvic Girdle	LGIS (Large group interactive session)
	Describe the mechanics of changes occurring in pelvic ligaments and joint mobility in late pregnancy	Anatomy (Obs & Gynae)		LGIS (Large group interactive session)
EnR-A-012	Describe the topographical anatomy of the pelvic floor. Describe origin, insertion, nerve supply and actions of muscle forming pelvic floor	Anatomy	Pelvic floor	LGIS (Large group interactive session)
EnR-A-013	Tabulate the attachments, innervations and actions of muscles forming the pelvic walls and floor	Anatomy	Pelvic Muscles	SGD (Small group discussion)

EnR-A-014	Describes injury to pelvic floor during childbirth and its complications	Anatomy (Obs & Gynae)	Pelvic Girdle	LGIS (Large group interactive session)
EnR-A-015	Describe the peritoneal reflections in the male and female pelvis	Anatomy	Peritoneum peritoneal cavity of pelvis	LGIS (Large group interactive session)
EnR-A-016	Describe the gross anatomical features of Sacrum	Anatomy	Sacrum	SGD (Small group discussion)
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		SGD (Small group discussion)
EnR-A-019	Tabulate the differences in peritoneal reflections in male and female pelvis	Anatomy	Peritoneal Reflection in Pelvis	SGD (Small group discussion)
EnR-A-020	Describe the origin, course, branches and distribution of common iliac artery	Anatomy	Pelvic Vessels	LGIS (Large group interactive session)
	Describe the origin, course, branches and distribution of external and internal iliac arteries			
	Describe the origin, course, tributaries and area of drainage of pelvic veins			
EnR-A-021	Describe the location, afferents and efferent of pelvic lymph nodes	Anatomy	Pelvic Lymph Nodes	LGIS (Large group interactive session)
EnR-A-022	Tabulate the origin, course, distribution and anastomosis of arteries of the pelvis	Anatomy	Pelvic Vessels & Pelvic nerves	SGD (Small group discussion)
	Describe the origin, root value, course, relations, branches and distribution of Pelvic nerves	Anatomy		LGIS (Large group interactive session)
	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		SGD (Small group discussion)
	Describe the clinical picture and anatomical justification for Ureteric Caliculi, Cystocele, Suprapubic Cystotomy, Rupture of Bladder	Anatomy		
	Describe the clinical picture and anatomical justification for Hypertrophy of Prostate	Anatomy		
	Describe the gross anatomical features of Ovaries and Fallopian Tubes with their relations, blood supply, nerve supply and lymphatic drainage. Describe related clinical conditions: 1) Positions of ovaries 2) Cysts of ovaries 3) Ectopic pregnancy 4) Tubal ligation 5) Salpingitis	Anatomy		LGIS (Large group interactive session)
	Describe the gross anatomical features, parts, peritoneal ligaments, blood supply, nerve supply & lymphatic & clinical aspects of Uterus and Vagina. Describe related clinical conditions 1. Prolapse of uterus 2. Vaginal trauma 3. culdocentesis s Describe, identify, justify and demonstrate the supports of uterus	Anatomy		LGIS (Large group interactive session)
EnR-A-024	Describe the gross anatomical features of Boundaries & divisions of perineum	Anatomy	Perineum	LGIS (Large group interactive session)
	Draw and label the boundaries of perineum	Anatomy		SGD (Small group discussion)
	List the contents of perineum			
	Tabulate the differences between the Male and female perineum			
	Describe the attachments of the perineal membrane and list its relations	Anatomy		LGIS (Large group interactive session)
	Discuss the formation of Superficial and Deep Perineal Pouches	Anatomy		

	List the contents of Superficial and Deep Perineal Spaces	Anatomy		SGD (Small group discussion)
	Tabulate the attachments, actions and nerve supply of muscles of perineum	Anatomy		
	Describe the topographical anatomy and neurovasculature of Penis	Anatomy		LGIS (Large group interactive session)
	Tabulate the muscles forming the perineal body with their attachments and nerve supply	Anatomy		SGD (Small group discussion)
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	LGIS (Large group interactive session)
CODE	**EMBRYOLOGY & POST-NATAL DEVELOPMENT**	**TOTAL HOURS = 14**		
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPIC**	**MIT**
EnR-A-026	Describe the contributing factors, histogenesis and sequence of events of the development of Thyroid gland	Anatomy	Development of Thyroid gland	LGIS (Large group interactive session)
	Explain the embryological basis of the Thyroglossal Cyst	Anatomy		
	Draw a concept map highlighting the development of thyroid gland	Anatomy		SGD (Small group discussion)
EnR-A-027	Describe the development of para-thyroid glands	Anatomy	Development Of Parathyroid glands	LGIS (Large group interactive session)
	Draw a concept map highlighting the development of para-thyroid gland	Anatomy		

EnR-A-028	Anatomically justify the clinical presentation of: 1. Ectopic Parathyroid 2. Aberrant Thyroid	Anatomy	Development of Thyroid, Parathyroid	LGIS (Large group interactive session)
EnR-A-029	Describe the development of pituitary gland Describe the embryological basis for the congenital anomalies of pituitary development	Anatomy	Development of Pituitary Gland	LGIS (Large group interactive session)
EnR-A-030	Describe the contributing factors, histogenesis and the development of adrenal gland	Anatomy	Development Of Adrenal Gland	LGIS (Large group interactive session)
	Draw a concept map for the development of adrenal gland	Anatomy		SGD (Small group discussion)
	Describe the embryological basis for the congenital anomalies of adrenal development	Anatomy		LGIS (Large group interactive session)
EnR-A-031	Identify the stages in the development of the adrenal gland	Anatomy	Adrenal Gland	SGD (Small group discussion)
EnR-A-032	Describe the indifferent gonads	Anatomy	Development of Reproductive system	SGD (Small group discussion)
	List and describe the Factors influencing the differentiation of gonads			
	Evaluate the role of the factors influencing Sex determination and differentiation			LGIS (Large group interactive session)
	Describe the Development and descent of testis	Anatomy		
EnR-A-033	Describe the embryological basis and locations of undescended testes	Anatomy	Testis	LGIS (Large group interactive session)
EnR-A-034	Draw a concept map highlighting the development of testis	Anatomy	Development of Reproductive system	LGIS (Large group interactive session)
	Explain the Development and descent of ovaries	Anatomy		
	Draw a concept map highlighting the development of ovaries	Anatomy		LGIS (Large group interactive session)
	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		LGIS (Large group interactive session)

	Describe the development of female genital ducts and glands, Development of uterus & Vagina. Describe related clinical anomalies: 1) Uterus Arcuatus 2) Uterus septus 3) Uterus Bicornis Bicollis 4) Uterus Bicornis Unicollis 5) Uterus Unicornis 6) Atresia of vagina 7) Double vagina 8) Imperforate hymen	Anatomy		LGIS (Large group interactive session)
	Describe the development of male genital ducts and glands	Anatomy		LGIS (Large group interactive session)
	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		LGIS (Large group interactive session)
	Describe the development of inguinal canal and descent of testis and embryological basis for Cryptorchidism, Ectopic Testis, Congenital Inguinal Hernia, Hydrocele	Anatomy		LGIS (Large group interactive session)
	Klinefelter, turner syndromes & androgen insufficiency Describe the embryological basis for the coverings of testis	Anatomy		LGIS (Large group interactive session)
CODE	**MICROSCOPIC STRUCTURE (HISTOLOGY & PATHOLOGY)**	**TOTAL HOURS = 14**		
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPIC**	**MIT**
EnR-A-035	Describe the histological basis and manifestation of Gastric Carcinoid Tumors	Anatomy/ Pathology	Stomach	LGIS (Large group interactive session)
	Classify the principal Enteroendocrine Cells on the basis of type, location, hormone produced and Actions	Anatomy		
EnR-A-036	Describe microscopic structure of Pituitary gland.	Anatomy	Pituitary Gland	LGIS (Large group

	Classify pituitary gland on the basis of cell type, hormone produced and functions	Anatomy		interactive session)
	Explain the histological basis and manifestation of Pituitary Adenomas	Anatomy		
EnR-A-037	Describe the light microscopic structure of Adrenal Gland	Anatomy	Adrenal Gland	LGIS (Large group interactive session)
	Explain the histological basis and manifestation of Addison disease	Anatomy		
EnR-A-038	Describe the light microscopic structure of endocrine pancreas	Anatomy	Pancreas	LGIS (Large group interactive session)
	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-039	Describe the light microscopic structure of Thyroid Gland	Anatomy	Thyroid Gland	LGIS (Large group interactive session)
	Describe the light microscopic structure of Parathyroid Gland	Anatomy		
	Describe the light microscopic structure of Pineal gland	Anatomy		
EnR-A-040	Describe the light and ultramicroscopic structure of Testes, structure & function of Sertoli cells. Describe Blood testes Barrier	Anatomy	Testes	LGIS (Large group interactive session)
	Describe the histological basis and manifestation of Orchitis, Cryptorchidism	Anatomy Pathology		
EnR-A-041	Describe the light microscopic structure of Epididymis	Anatomy	Epididymis	LGIS (Large group interactive session)
EnR-A-042	Describe the light microscopic structure of vas deferens	Anatomy	Vas deferens	LGIS (Large group interactive session)
EnR-A-043	Describe the light microscopic structure of seminal vesicle	Anatomy	Seminal Vesicle	LGIS (Large group interactive session)
EnR-A-044	Describe the light microscopic structure of Prostate Gland	Anatomy	Prostate gland	LGIS (Large group interactive

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

PRACTICAL

CODE	**HISTOLOGY**	**TOTAL HOURS = 11**		
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**	**MIT**
EnR-A-051	Identify draw & Label the Pituitary gland under light microscope	Anatomy	Pituitary gland	Laboratory Practical
EnR-A-052	Identify draw & label the Thyroid & Parathyroid glands under light microscope	Anatomy	Thyroid & Parathyroid	Laboratory Practical
EnR-A-053	Identify draw & Label the Adrenal gland under light microscope	Anatomy	Adrenal Gland	Laboratory Practical

EnR-A-054	Identify draw & Label Testes, Epididymis & Vas deferens under the light Microscope	Anatomy	Testes Epididymis Vas Deferens	Laboratory Practical
EnR-A-055	Identify draw & label the seminal vesicle & prostate gland under light Microscope	Anatomy	Seminal Vesicle Prostate Gland	Laboratory Practical
EnR-A-056	Identify, draw and label the ovaries under light microscope	Anatomy	Ovaries	Laboratory Practical
EnR-A-057	Identify, draw and label the slide of different phases of uterus under light microscope	Anatomy	Uterus	Laboratory Practical
EnR-A-058	Identify, draw and label the fallopian tube under light microscope	Anatomy	Fallopian Tube	Laboratory Practical
EnR-A-059	Identify, draw and label the cervix under light microscope	Anatomy	Cervix	Laboratory Practical
EnR-A-060	Identify, draw and label the vagina under light microscope	Anatomy	Vagina	Laboratory Practical
EnR-A-061	Identify, draw and label the mammary gland (different stages) under light microscope	Anatomy	Mammary gland	Laboratory Practical
NORMAL FUNCTION				
THEORY				
CODE	**MEDICAL PHYSIOLOGY**	**TOTAL HOURS = 59**		
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**	**MIT**
EnR-P-001	Define different chemical messengers. Enlist endocrine organs and hormones of the body. Enlist the hormones on the basis of chemical nature. Discuss the feedback control of hormone secretion. Explain the up and down regulation of receptors. Enlist the location of hormone receptors.	Biochemistry	Introduction to Endocrinology	LGIS (Large group interactive session)

	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.			LGIS (Large group interacti ve session)

EnR-P-001	Name the hormones/ factors of hypothalamus. Name the hormones of anterior pituitary. Name the hormones of posterior pituitary. Describe the functional relationship between hypothalamus, anterior and posterior pituitary gland. Explain the significance of hypothalamic- hypophysial portal circulation. Explain the hypothalamic pituitary tract. Explain the mechanism of action of growth hormone. Explain the actions of Growth Carbohydrate. Discuss the actions of Growth hormone on protein metabolism. Describe the actions of Growth hormone on fat metabolism.	Physiology	Hypothalamus / Pituitary Gland	LGIS (Large group interactive session)
	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			LGIS (Large group interactive session)

	oxytocin. Discuss the actions of oxytocin.			
EnR-P-002	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	Physiology	Thyroid gland	LGIS (Large group interactive session)
	Explain the features, pathophysiology and treatment of thyrotoxicosis/ grave's disease Explain the thyroid function test to investigate hypo and			LGIS (Large group interactive session)
	hyperthyroidism Enlist the causes of hypothyroidism Explain the pathophysiology of Hashimoto hypothyroidism Discuss the features and pathophysiology and treatment of myxedema Explain the pathophysiology and features of endemic colloid goiter Discuss the pathophysiology and features of nontoxic colloid goiter Enlist the causes of cretinism Discuss the features and pathophysiology of cretinism			LGIS (Large group interactive session)

EnR-P-003	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 syn Cushing's disease	Physiology & Pathology	Adreno cortical hormones	LGIS (Large group interactive session)
	Explain the clinical importance of dexamethasone suppression test to diagnose Cushing's syndrome. Discuss the features, pathophysiology and treatment of Conn's syndrome. Enlist the cause, features and pathophysiology of congenital adrenal hyperplasia/ Androgenital syndrome.			LGIS (Large group interactive session)

EnR-P-004	Enumerate the types of pancreatic cells with their hormones. Explain the mechanism of action of insulin. Discuss the synthesis and mechanism of release of insulin. Explain the effects of insulin on carbohydrate, protein and lipid metabolism. Enlist the actions of insulin on liver, adipose tissue and skeletal muscle. Enlist the factors and conditions that increase or decrease insulin secretion.	Physiology	Pancreatic hormones	LGIS (Large group interactive session)
	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.			LGIS (Large group interactive session)
EnR-P-005	Enlist the types of diabetes mellitus Explain the causes of Type I and type II diabetes mellitus Discuss the features and pathophysiology of diabetes mellitus Explain the role of insulin resistance, obesity and metabolic syndrome in developing type II Diabetes mellitus	Physiology	Abnormalities of Glucose regulation	LGIS (Large group interactive session)
	Explain how to diagnose the diabetes mellitus Explain the treatment of type I and type II diabetes mellitus Explain the features, cause of insulinoma			LGIS (Large group interactive session)

EnR-P-006	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	LGIS (Large group interactive session)
EnR-P-007	Discuss the effects of Vitamin D Discuss the effects of calcitonin on calcium Discuss the regulation of calcium (the first & second line of defense) Explain the causes and features of hypoparathyroidism Explain the causes and the features of primary and secondary hyperparathyroidism Enumerate the causes and features of osteoporosis	Physiology	Regulation of calcium in body	LGIS (Large group interactive session)
EnR-P-008	Enlist the functions of adrenal medullary hormones and explain pheochromocytoma	Physiology	Adreno medullary hormones	LGIS (Large group interactive session)
EnR-P-009	Describe the hormonal factors that affect spermatogenesis Explain the maturation and storage of sperm in epididymis Discuss the structure and physiology of a mature sperm Describe the composition of semen Discuss the functions of prostate & seminal vesicles in the formation of semen Explain the phenomenon of capacitation and its significance Describe the acrosome Reaction and its significance Discuss the role of pineal gland in reproduction	Physiology	Spermatogenesis Capacitation & Acrosome reaction	LGIS (Large group interactive session)
EnR-P-010	Discuss the site of secretion of testosterone	Physiology	Testosterone	LGIS (Large group interactive session)

	Name the active form of testosterone Explain the production of estrogen in males Describe the basic intracellular mechanism of action of testosterone			LGIS (Large group interactive session)
	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			LGIS (Large group interactive session)
EnR-P-011	Enumerate and explain the phases of ovarian cycle along with the hormonal changes Explain the postulated mechanism of ovulation Explain the formation and involution of Corpus luteum Endometrial cycle Explain the structural and hormonal changes of endometrial cycle Explain the regulation of female monthly cycle Discuss the role of progesterone on female sexual organs	Physiology	Menstrual cycle	LGIS (Large group interactive session)
EnR-P-012	Enumerate the ovarian hormones Discuss the synthesis of estrogen and progesterone Describe the interaction of follicular theca and granulosa cells for production of estrogens with the help of a diagram Explain the functions of the estrogens on different organs Discuss the role of progesterone on female sexual organs	Physiology	Female sexual hormones	LGIS (Large group interactive session)
EnR-P-013	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	LGIS (Large group interactive session)
EnR-P-014	Explain the non-hormonal functions of placenta	Physiology	Normal Pregnancy	LGIS (Large group interactive session)

	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			LGIS (Large group interactive session)
EnR-P-015	Explain the physiology of lactation Discuss the actions of prolactin Justify the suppression of ejection of milk during pregnancy Discuss the physiological basis of suppression of the female ovarian cycles in nursing mothers for many months after delivery	Physiology	Lactation	LGIS (Large group interactive session)
CODE	**MEDICAL BIOCHEMISTRY**	**TOTAL HOURS = 35**		
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**	**MIT**
EnR-B-001	Define different chemical messengers. Enlist endocrine organs and hormones of the body. Enlist the hormones on the basis of chemical nature. Discuss the feedback control of hormone secretion. Explain the up and down regulation of receptors. Enlist the location of hormone receptors. Explain the mechanism of intracellular signaling after hormone receptor activation. Name the hormones that use enzyme-linked hormone receptors signaling. Explain the mechanism of enzyme linked receptors. Explain the mechanism of hormones that receptors present in cytoplasm and nucleus (act on genetic machinery).	Biochemistry	Introduction to Endocrinology	LGIS (Large group interactive session)

	Enlist second messenger mechanisms for mediating intracellular hormonal functions.			LGIS (Large group interactive session)
	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.			LGIS (Large group interactive session)
EnR-B-002	Describe the features of Signal transduction Describe different types of receptors	Biochemistry	Signal Transduction	LGIS (Large group interactive session)
EnR-B-003	Discuss the classification of hormones	Biochemistry	Classification of hormones	LGIS (Large group interactive session)

EnR-B-004	Describe different types of second messengers Differentiate the G protein and non-G protein mediated pathways of signal transduction Discuss the hormones which act through: Cyclic AMP (Adenosine monophosphate) Discuss the hormones which act through: Cyclic GMP (guanosine monophosphate) 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	LGIS (Large group interactive session)
	Explain the control and negative feedback mechanism of hormone regulation	Biochemistry		LGIS (Large group interactive session)
	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		LGIS (Large group interactive session)
	Interpret disorders of hormones on the basis of sign, symptoms and given data	Biochemistry		LGIS (Large group interactive session)
EnR-B-005	Explain the synthesis, secretion, transport and clearance of steroid and protein hormones.	Biochemistry	Synthesis of Hormones	LGIS (Large group interactive session)
EnR-B-006	Enlist the steps in the synthesis of adrenocortical hormone. Explain the synthesis and secretion of ACTH (Adrenocorticotropic hormone) in association with melanocyte-stimulating hormone, lipotropin, and endorphin.	Biochemistry	Synthesis of ACTH & adrenocortical	LGIS (Large group interactive session)

EnR-B-007	Explain the structure, biosynthesis, secretion, transport, regulation, catabolism, mechanism of action and biochemical role of testosterone, progesterone and estrogen	Biochemistry	Synthesis of testosterone, progesterone and estrogen	LGIS (Large group interactive session)
EnR-B-008	Discuss the role of steroid hormones in oral contraception, Infertility	Biochemistry	Steroid in infertility	LGIS (Large group interactive session)
EnR-B-009	Define the following terms: chromosome, allele (dominant and recessive), gene, locus, heterozygote, homozygote, hemizygous, autosome, genotype, phenotype, haploid and diploid number of chromosomes, aneuploidy, proband, proposita, pedigree, propositus, penetrance, codominance and polygenic	Biochemistry	Nomenclature of genetics	LGIS (Large group interactive session)
EnR-B-010	Discuss the structures of genes, how they are organized and regulated.	Biochemistry	Genes	LGIS (Large group interactive session)
EnR-B-011	Describe Mendelian Law of Segregation and Law of Independent Assortment.	Biochemistry	Mendelian laws	LGIS (Large group interactive session)
EnR-B-012	Describe the patterns of inheritance characteristic of autosomal dominant, autosomal recessive, X- linked	Biochemistry	Patterns of inheritance	LGIS (Large group interactive session)
	dominant, X-linked recessive and mitochondrial traits.			LGIS (Large group interactive session)
EnR-B-013	Interpret genetic symbols as they appear in pedigrees.	Biochemistry	Pedigrees	LGIS (Large group interactive session)
EnR-B-014	Analyze pedigree to determine the mode of inheritance of following traits: 1) X-linked recessive (Duchenne Muscular dystrophy) 2) X-linked dominant (Rickets) 3) Autosomal recessive (Xeroderma Pigmentosum) 4) Autosomal dominant (Huntington's Disease)) Mitochondrial disorder (Mitochondrial diabetes)	Biochemistry	Mode of inheritance	LGIS (Large group interactive session)
EnR-B-015	Discuss different structural and numerical chromosomal abnormalities.	Biochemistry	Chromosomal abnormalities	LGIS (Large group interactive session)

EnR-B-016	Interpret the normal human karyotype in terms of number and structure of chromosomes.	Biochemistry	Karyotypes	LGIS (Large group interactive session)
EnR-B-017	Describe the effect of the following chromosomal mutations on a segment of DNA: point mutation, frameshift mutation, deletion, insertion, inversion, Robertsonian Translocation and mosaicism.	Biochemistry	Mutations	LGIS (Large group interactive session)
EnR-B-018	Discuss the concept of central dogma from gene to protein (replication, transcription and translation)	Biochemistry	Central dogma (Overview)	LGIS (Large group interactive session)
EnR-B-019	Discuss the gene expression especially Lac operon and Tryptophan operon	Biochemistry	Gene Expression	LGIS (Large group interactive session)
EnR-B-020	Discuss the regulation of eukaryotic gene expression with special emphasis on iron metabolism and RNA interference	Biochemistry	Gene Expression	LGIS (Large group interactive session)
EnR-B-021	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	LGIS (Large group interactive session)

PRACTICAL				
CODE	**BIOCHEMISTRY**	**TOTAL HOURS = 06+02=08**		**MIT**
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**	
EnR-B-022	Perform DNA extraction	Biochemistry	DNA	LGIS (Large group interactive session)
EnR-B-023	Perform Electrophoresis	Biochemistry	Electrophoresis	LGIS (Large group interactive session)
EnR-B-0234	Perform PCR	Biochemistry	PCR	LGIS (Large group interactive session)
EnR-B-025	Demonstrate ELISA (enzyme-linked immunoassay) to measure concentration of hormones	Biochemistry	ELISA	LGIS (Large group interactive session)
EnR-P-016	Perform Pregnancy test	Physiology	Pregnancy test	LGIS (Large group interactive session)

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS				
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 02**		**MIT**
		DISCIPLINE	**TOPIC**	
EnR-Ph-001	Explain the mechanism of action of thyroxine	Pharmacology	Anti thyroid substance & MOA, uses, effects	LGIS (Large group interactive session)
	Explain Clinical uses and potential adverse effects with use of Thyroxine			LGIS (Large group interactive session)
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 09**		
		DISCIPLINE	**TOPIC**	**MIT**
EnR-Pa-001	Enumerate clinical manifestations along with hormone levels of anterior pituitary Classification of pituitary adenomas	Pathology	Pathology of Anterior Pituitary Gland	LGIS (Large group interactive session)
EnR-Pa-002	Enumerate and describe posterior pituitary syndromes (inappropriate ADH (Anti Diuretic Hormone) secretion, diabetes insipidus)	Pathology	Pathology of Posterior Pituitary Gland	LGIS (Large group interactive session)
EnR-Pa-003	Enumerate causes of hypo and hyperthyroidism along with levels of thyroid hormones	Pathology	Pathology of Thyroid Gland	LGIS (Large group interactive session)
EnR-Pa-004	Enumerate causes of hypercalcemia, hyper and hypoparathyroidism	Pathology	Pathology of Parathyroid Gland	LGIS (Large group interactive session)
EnR-Pa-005	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	LGIS (Large group interactive session)
EnR-Pa-006	Enumerate causes of Cushing syndrome with lab investigations Causes and clinical features of adrenocortical insufficiency (Addison disease)	Pathology	Pathology of Adrenal Gland	LGIS (Large group interactive session)

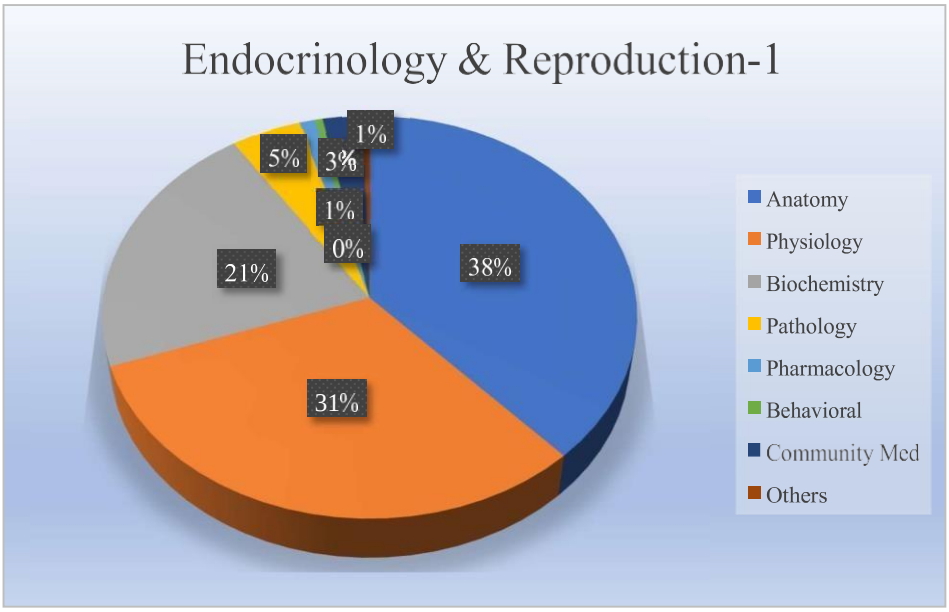
EnR-Pa-007	Enumerate causes of lower genital tract infections and PIDs along with lab investigations Enumerate causes of infertility in females along with hormonal investigations Causes of dysfunctional uterine bleeding with histopathological features Pathophysiology and lab diagnosis of eclampsia and preeclampsia Causes of placental implantations (ectopic pregnancy)	Pathology	Female Reproductive Pathology	LGIS (Large group interactive session)
EnR-Pa-008	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	LGIS (Large group interactive session)
DISEASE PREVENTION AND IMPACT				
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 05**		**MIT**
		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	LGIS (Large group interactive session)
	Describe epidemiological risk factors for Diabetes Epidemiological distribution & statistics of DM Screening of community for Diabetes Apply levels of prevention for control of Diabetes.			LGIS (Large group interactive session)

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	LGIS (Large group interactive session)
EnR-CM-003	Define women health and life cycle approach for healthrelated events. Highlight statistics related to human reproductive health issues.	Community Medicine	Reproductive health	LGIS (Large group interactive session)
	Enumerate health related problems across a woman's reproductive lifetime. Explain the components of reproductive health.			LGIS (Large group interactive session)

AGING

CODE	THEORY	TOTAL HOURS = 01		
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**	**MIT**
EnR-Ag-001	Enlist the changes that occur in female body after menopause.	Gynae/ OBS	Menopause	LGIS (Large group interactive session)

Distribution and duration of teaching hours amongst disciplines



Module Weeks	Recommended Minimum Hours
07	194

MODULE 09
HEAD & NECK, SPECIAL SENSES

Module rationale

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

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

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

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

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 healthcare professionals to provide comprehensive care for patients. Equip themwith 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

Syllabus of module 09
Head & Neck and Special senses

NORMAL STRUCTURE				
	THEORY			
CODE	GROSS ANATOMY	TOTAL HOURS = 56		
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC	MIT
HNSS-A-001	Define the boundaries and openings of orbital cavity. List orbital contents and structures traversing theseopenings.	Human Anatomy	Vision	LGIS (Large group interactive session)
	In a tabulated manner list the extraocular and intraocular muscles of eyeball giving their nerve supply and actions			SGD (Small group discussion)
	List and define the movements of eyeball with specialreference 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.			LGIS (Large group interactive session)
	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'ssyndrome.			SGD (Small group discussion)
	Describe the course and branches of ophthalmic arterymentioning its origin and termination.			
	Describe the structure of eyelids, conjunctiva and tarsal glands with their neurovascular supply			

	List the parts of Lacrimal apparatus giving their location and anatomical features. Describe the nerve supply of lacrimal gland.	Human Anatomy		
	Describe the location, roots and distribution of pterygopalatine ganglia.	Human Anatomy		
	Give the anatomical structure of eyeball emphasizing on its three coats and their neurovascular supply	Human Anatomy		LGIS (Large group interactive session)
HNSS-A002	Describe the boundaries of nasal cavity: nasal septum, lateral wall of nose, roof and floor. Give their anatomical features and neurovascular supply.	Human Anatomy	Olfaction	LGIS (Large group interactive session)
	Describe the anatomical features and ne	Human Anatomy		LGIS (Large group interactive session)
	List the paranasal sinuses giving their locations, openings, neurovascular supply and clinical significance.	Human Anatomy		SGD (Small group discussion)
	Describe the course and distribution of olfactory nerve in reference to olfactory pathway. Give the effects of its lesions.	Human Anatomy		LGIS (Large group interactive session)
	Describe the anatomical features and ne	Human Anatomy		
HNSS-A003	Describe the boundaries, contents, neurovascular supply and communications of middle ear cavity.	Human Anatomy	Hearing	LGIS (Large group interactive session)
	Describe the parts, anatomical features and neurovascular supply of internal ear.	Human Anatomy		LGIS (Large group interactive session)
	Describe the course and distribution of vestibulocochlear neve mentioning the effects of its lesion. Describe auditory pathway.	Human Anatomy		

HNSS-A004	Describe the anatomical features of tongue with emphasis on its mucosa, attachments, musculature, vascular supply and lymphatic drainage.	Human Anatomy	Taste	LGIS (Large group interactive session)
	Describe the nerve supply of tongue (general sensory, special sensory and motor) with reference to their lesions and embryological basis.	Human Anatomy		LGIS (Large group interactive session)
	List taste buds mentioning their structure, location and nerve supply. Describe the taste pathway.	Human Anatomy		SGD (Small group discussion)
	Discuss lesions of motor and sensory nerves supplying the tongue. Discuss the anatomical correlates of lingual carcinoma in reference to lymphatic drainage of tongue.	Human Anatomy		LGIS (Large group interactive session)
HNSS-A005	Describe the features of Norma Frontalis, Norma Verticalis, Norma Parietalis, Norma occipitalis and Norma Basalis	Human Anatomy	Skull	SGD (Small group discussion)
	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	SGD (Small group discussion)
	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	SGD (Small group discussion)

HNSS-A-008	Describe the functional modalities, course, branches, and distribution of cranial nerves innervating the face (sensory and motor): trigeminal and facial nerves	Human Anatomy	Neurovascular supply of face	LGIS (Large group interactive session)
	Describe the vascular supply and lymphatic drainage of face.	Human Anatomy		LGIS (Large group interactive session)
	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 clinical significance.	Human Anatomy		LGIS (Large group interactive session)
HNSS-A-009	Describe the danger area of face with it its clinical significance. Define the routes of spread of infection from face and scalp to intracranially.	Human Anatomy	Danger area	LGIS (Large group interactive session)
HNSS-A010	Describe the bony features and muscle attachment of mandible.	Human Anatomy	Mandible	SGD (Small group discussion)
	Classify temporomandibular joint mentioning its ligaments, relations, nerve supply and movements (with their mechanics and muscles producing them).	Human Anatomy		LGIS (Large group interactive session)
HNSS-A-011	Describe anatomical features, relations and neurovascular supply of parotid gland and its duct, mentioning the structures entering and exiting the gland	Human Anatomy	Parotid gland	LGIS (Large group interactive session)
	Discuss the clinical correlates of parotid gland: parotiditis, Mumps, Frey's syndrome, parotid duct stones and parotid tumor surgery with its complications	Human Anatomy		LGIS (Large group interactive session)
HNSS-A-012	Describe the parts and boundaries of oral cavity and give its relation to the Waldeyers' ring.	Human Anatomy	Waldeyers' ring	LGIS (Large group interactive session)
HNSS-A-013	Describe the anatomical features of hard and soft palate with their neurovascular supply.	Human Anatomy	Hard and soft	LGIS (Large group

				interactive session)
HNSS-A-014	Describe anatomical features, relations and neurovascular supply of submandibular and sublingual glands with their ducts.	Human Anatomy	Submandibular Sublingual glands	LGIS (Large group interactive session)
HNSS-A-015	Describe the location, roots and distribution of otic and submandibular ganglia.	Human Anatomy	Otic and Submandibular ganglia.	LGIS (Large group interactive session)
HNSS-A-016	Describe the anatomical features of Hyoid bone and give attachments on the bone.	Human Anatomy	Hyoid bone	SGD (Small group discussion)
HNSS-A-017	Enumerate the types of cervical vertebrae and list the differences between them.	Human Anatomy	Cervical vertebrae	SGD (Small group discussion)
	Describe the anatomical features and attachments on cervical vertebrae.			LGIS (Large group interactive session)
	Classify the joints of cervical vertebrae mentioning their ligaments, movements with muscle producing them and neurovascular supply.	Human Anatomy		LGIS (Large group interactive session)
HNSS-A-018	List the prevertebral muscles of cervical region. Describe their attachments, actions and innervation.	Human Anatomy	Prevertebral muscles	SGD (Small group discussion)
HNSS-A-019	Enumerate parts of deep cervical fascia with their respective extents, attachments, relations and contents.	Human Anatomy	Deep cervical fascia	SGD (Small group discussion)
HNSS-A-020	Describe the facial spaces in head and neck mentioning their communications and their relation to spread of infection.	Human Anatomy	Facial spaces	LGIS (Large group interactive session)
HNSS-A-021	Describe the attachments, actions and nerve supply of infrahyoid and suprahyoid muscles of neck.	Human Anatomy	Infrahyoid and suprahyoid muscles	LGIS (Large group interactive session)
HNSS-A-022	Describe the location, formation and distribution of ansa cervicalis.	Human Anatomy	Ansa cervicalis.	LGIS (Large group interactive session)

HNSS-A-023	Describe the attachments, actions and nerve supply of sternocleidomastoid and trapezius.	Human Anatomy	Sternocleidomastoid and trapezius	LGIS (Large group interactive session)
HNSS-A-024	Describe the boundaries and contents of suboccipital, anterior and posterior triangles of neck.	Human Anatomy	Triangles of neck	LGIS (Large group interactive session)
HNSS-A-025	Describe the cervical part of trachea and esophagus with their neurovascular supply.	Human Anatomy	Trachea and esophagus	LGIS (Large group interactive session)
HNSS-A-026	Describe the location, anatomical features and vascular supply of thyroid and parathyroid glands. List the variations in location of parathyroid glands.	Human Anatomy	Thyroid, Parathyroid glands	LGIS (Large group interactive session)
HNSS-A-027	Describe the carotid arteries mentioning their origin, course, branches, distribution and termination.	Human Anatomy	Carotid arteries	LGIS (Large group interactive session)
HNSS-A-028	Describe carotid body and carotid sinus and give their clinical significance.	Human Anatomy	Carotid body	LGIS (Large group interactive session)
HNSS-A-029	Give the venous drainage of Head and Neck region. Describe the formation, tributaries and area of drainage of vessels constituting jugular venous system.	Human Anatomy	Head & Neck venous supply	LGIS (Large group interactive session)
HNSS-A-030	Name the superficial and deep cervical lymph nodes and give their location and drainage areas	Human Anatomy	Lymphatics	LGIS (Large group interactive session)
HNSS-A-031	Describe the location, formation, branches, distribution and lesions of cervical plexus	Human Anatomy	Cervical plexus	LGIS (Large group interactive session)
HNSS-A032	Name the parts of pharynx giving their extent, anatomical features, structure and neurovascular supply.	Human Anatomy	Pharynx	LGIS (Large group interactive session)
	Name the pharyngeal constrictor muscles defining			
	their attachments, innervation and structure traversing the gaps between adjacent muscles.	Human Anatomy		

HNSS-A-033	Name the parts of larynx giving their extent, anatomical features, musculoskeletal framework and neurovascular supply.	Human Anatomy	Larynx	LGIS (Large group interactive session)
HNSS-A-034	Discuss the location, anatomical features, relations and vascular supply of tonsils: nasopharyngeal, palatine and lingual.	Human Anatomy	Tonsils	LGIS (Large group interactive session)
CODE	**EMBRYOLOGY & POST-NATAL DEVELOPMENT**	**TOTAL HOURS = 15**		
	SPECIFIC LEARNING OUTCOMES	**DISCIPLINE**	**TOPIC**	**MIT**
HNSS-A-035	List the components of pharyngeal apparatus. Describe the development of pharyngeal arches, grooves, pouches and membrane and give derivatives and fate of each of them.	Embryology	Pharyngeal apparatus pharyngeal arches	LGIS (Large group interactive session)
HNSS-A-036	Describe the development and histogenesis of auditory tube, tympanic cavity, tonsils, thymus and parathyroid	Embryology	auditory tube, tympanic cavity, tonsils, thymus and parathyroid	LGIS (Large group interactive session)
HNSS-A-037	Discuss the embryological basis of congenital anomalies related to the development of pharyngeal arches, pharyngeal clefts and pharyngeal pouches: cervical sinus/fistula/cyst, 1st arch syndrome, DiGeorge syndrome, congenital malformations of thymus and parathyroid glands	Embryology	Congenital anomalies	LGIS (Large group interactive session)
HNSS-A038	Describe the development of tongue and thyroid gland.	Embryology	Tongue and Thyroid gland.	LGIS (Large group interactive session)
	List and provide embryological basis of congenital			
	anomalies of tongue and thyroid gland.	Embryology		
HNSS-A-039	Describe the development of face and nasolacrimal ductand their respective congenital anomalies.	Embryology	Face and nasolacrimal duct	LGIS (Large group interactive session)
HNSS-A-040	Describe the development of nasal cavity and paranasalsinuses. Give the associated congenital anomalies.	Embryology	Nose	LGIS (Large group interactive session)

HNSS-A-041	Describe the development of lip and palate and their associated congenital malformations.	Embryology	Lips and palate	LGIS (Large group interactive session)
	Explain the types and embryologic basis of cleft lip	Embryolog		LGIS (Large group interactive session)
	and cleft palate.	Embryology		
HNSS-A-042	Describe the development of optic vesicle and retina.	Embryology	Eye & ear	LGIS (Large group interactive session)
	Describe the development of cornea, sclera, choroid, iris, ciliary body and lens and relate it to their respective congenital anomalies.	Embryology		LGIS (Large group interactive session)
	Describe the development of internal ear and give the embryological basis of associated congenital anomalies.	Embryology		LGIS (Large group interactive session)
CODE	**MICROSCOPIC ANATOMY (HISTOLOGY & PATHOLOGY)**	**TOTAL HOURS = 08**		
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**	**MIT**
HNSS-A-043	Describe the light and electron microscopic structure of tongue mentioning the histological structure of lingual papillae and taste buds.	Histology	Tongue	LGIS (Large group interactive session)
HNSS-A-044	Describe the histological structure of parotid, submandibular and sublingual glands.	Histology	Glands	LGIS (Large group interactive session)
	Compare and contrast the histological structures of parotid, submandibular and sublingual glands.	Histology		
HNSS-A-045	Differentiate between serous and mucous acini. Describe the structure and location of serous demilunes. Describe the serous and mucous acini and give histological differences between the two.	Histology	Head & Neck	LGIS (Large group interactive session)
HNSS-A-046	Describe the histological structure of thyroid gland andparathyroid gland.	Histology	Thyroid, Parathyroid glands	LGIS (Large group interactive session)
HNSS-	Describe the histological structure of layers of eyeball,eyelid and retina.	Histology	Eye	LGIS (Large group interactive

A047	Describe the light and electron microscopic structure of cornea.	Histology		session)
HNSS-A-048	Describe the histological and ultramicroscopic structure of internal ear with special reference to Organ of Corti.	Histology	Ear	LGIS (Large group interactive session)
Practical				
CODE	**HISTOLOGY**	**TOTAL HOURS = 09**		
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**	**MIT**
HNSS-A-049	Identify, draw and label diagrams to show histological structure of tongue, lingual papillae and taste buds.	Histology	tongue	Laboratory Practical
HNSS-A-050	Identify, draw and label a diagram to show histological structure of parotid, submandibular and sublingual glands.	Histology	Glands	Laboratory Practical
HNSS-A-051	Draw and label diagrams to show histological structure of serous demilunes, serous and mucous acini.	Histology	Head & Neck	Laboratory Practical
HNSS-A-052	Draw and label a diagram to show histological structure of thyroid and parathyroid gland.	Histology	Thyroid, Parathyroid	Laboratory Practical
HNSS-A-053	Draw and label diagrams to show histological structure of eyelid and cornea.	Histology	Eye	Laboratory Practical
	Draw and label a diagram to show histological			
	structure of retina. List its histological layers and their respective components	Histology		
HNSS-A-054	Draw and label a diagram to show histological structure of internal ear.	Histology	Ear	Laboratory Practical
NORMAL FUNCTION				
THEORY				
CODE	**MEDICAL PHYSIOLOGY**	**TOTAL HOURS = 30**		
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**	

HNSS-P-001	Define and describe the visual acuity	Physiology	Visual Acquity
	Define Emmetropia	Physiology	
	Enlist the errors of refraction	Physiology	
	Explain the cause, features, physiological basis, and correction of Hyperopia	Physiology	
	Explain the cause, features, physiological basis,		
	and correction of myopia	Physiology	
	Explain the cause, features, physiological basis, and correction of astigmatism	Physiology	
	Describe the pathophysiology and treatment of cataract	Integrate with Ophthalmology	
HNSS-P-002	Interpret common treatment modalities f 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	Glaucoma
	Describe the method for measuring the intraocular pressure	Integrate with Ophthalmology	
	Describe the causes and features a h pathophysiology of glaucoma	Physiology	
HNSS-P-004	Discuss the clinical features of Open Angle and Angle Closure Glaucoma	Physiology	
HNSS-P-005	Describe the physiological anatomy and function of structural elements of retina	Physiology	Retina
	Enlist different layers of retina	Physiology	
	Explain the significance of melanin pigment in retina	Physiology	
	Describe macula and foveal region of retina and their significance	Physiology	
	Describe the structure of rods and cones	Physiology	

	Comment on the location of optic disc and its significance	Physiology	
	Describe the cause, features, and treatment of retinal detachment	Physiology	
	Enlist the current investigations for Retinal Diseases	Integrate with Ophthalmology	
HNSS-P006	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-P007	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 tri color mechanism of col 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-P010	Define the physiological blind spot and describe itslocation	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-P015	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-P016	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-P018	Describe the physiological anatomy and function of organ of Corti	Physiology	Organ of Corti
	Describe the mechanism of generation of endocochlear potential and its significance	Physiology	
HNSS-P019	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-P020	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-P021	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-022	Describe the mechanism of stimulation of taste buds/ receptor potential	Physiology	Excitation of Taste buds
	Trace the pathway of taste sensation	Physiology	
HNSS-P023	Define and explain the terms: A Hypergeusia, Hypogeusia and dysgeusia	Physiology	Abnormalities of Taste sensations
	Describe the senile changes in taste buds		
HNSS-P-024	Explain the terms: Taste preference and taste aversion	Physiology	Taste preference and aversion

HNSS-P-025	Enlist the primary sensations of smell	Physiology	Sense of smell
	Describe the physiological anatomy and location of olfactory membrane	Physiology	
HNSS-P-026	Enlist the causes and clinical features of Rhinitis	Integrate with Otorhinolaryng ology	Rhinitis
	Differentiate between viral and allergic Rhinitis	Integrate with Otorhinolaryng ology	
CODE	**MEDICAL BIOCHEMISTRY**	**TOTAL HOURS = 7**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**
HNSS-B-001	Discuss the metabolism of mono and disaccharides	Biochemistry	Metabolism of mono and disaccharides
	Interpret Hereditary fructose intolerance, fructosuria, galactosemia and lactose intolerance, in relevance to the clinical findings	Biochemistry	
	Explain the Polyol pathway and effect of hyperglycemia on sorbitol pathway	Biochemistry	
	Discuss the sources, metabolically active forms, biochemical role and clinical correlation of Vit-A with vision	Biochemistry	
HNSS-B-002	Discuss biochemical basis and clinical aspects of Riboflavin	Biochemistry	Vitamins
HNSS-B-003	Discuss the sources, absorption, regulation, biomedical functions and clinical aspect of Zn, Fl	Biochemistry	Eye
practical			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 16+05=21**	
		DISCIPLINE	**TOPIC**
HNSS-P-027	Examine the Second, Third, Fourth & Sixth Cranial Nerves	Physiology	Cranial Nerves
HNSS-P-028	Examination of Light Reflex		Light reflex
HNSS-P-029	Determine the Visual Acuity for Far and Near vision		vision

HNSS-P-030	Perform Ophthalmoscopy		ophthalmoscopy
HNSS-P-031	Examine Field of Vision and interpretation of visual field plotted	Physiology	Visual field
HNSS-P-032	Examine Color Vision		Color vision
HNSS-P-033	Perform Tuning fork test and audiometry, interpret the report		Ear
HNSS-B-004	Perform estimation of uric acid level in blood	Biochemistry	Uric acid level in blood
HNSS-B-005	Perform HbA1C by chromatographic method		HbA1C
HNSS-B-006	Detect abnormal constituents in urine by chemical methods		Abnormal constituents in urine

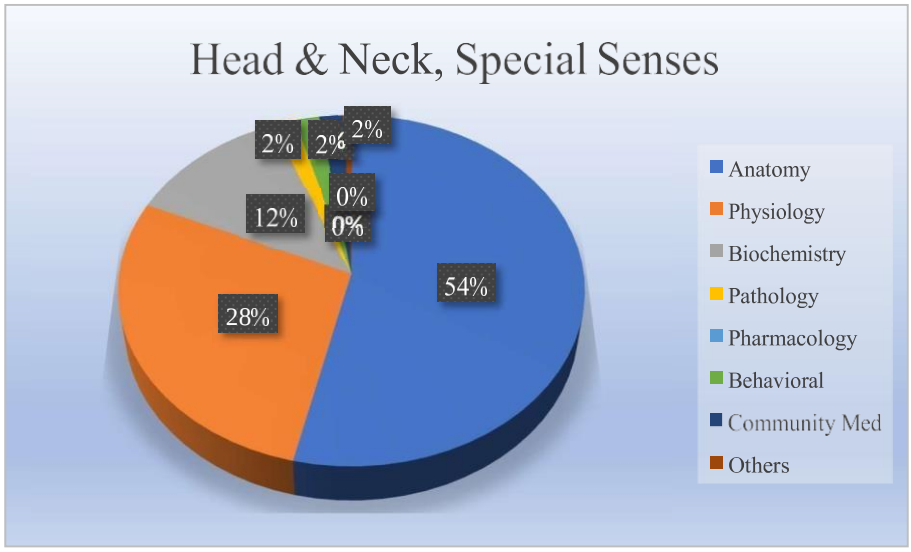
PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 09**	
		DISCIPLINE	**TOPIC**
HNSS-Pa001	Enlist the common causative agents of Eye, Ear infections	Pathology (Microbiology)	Eye/Ear infections
	Discuss the pathogenesis and clinical features of common pathogens	Pathology (Microbiology)	

HNSS-B-004	Correlate proto-oncogene and oncogene concept with relevance of tumors	Biochemistry	Oncogenes
HNSS-B-005	Discuss tumor markers and their significance		Tumor markers
HNSS-B006	Discuss the concept of xenobiotics		Genetics
	Explain and interpret pedigree of multifactorial mitochondrial disorder i.e. Libers hereditary optic neuropathy		

DISEASE PREVENTION AND IMPACT		
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 07**

		DISCIPLINE	TOPIC
HNSS-B-007	Explain the role of antioxidants (selenium (Se), Vit-E & C, Glutathione) in preventing oxidative stress	Biochemistry	Anti-oxidants
HNSS-CM-001	Identify factors leading to noise pollution	Community Medicine/ Otorhinolaryngology	Hearing loss
HNSS-CM-002	Describe the common causes of blindness in community	Community Medicine	Blindness
	Describe risk factors and preventive strategies for blindness at community level	Behavioral Sciences	
HNSS-BhS-001	At end of module the students will learn the psychosocial aspects of pain which will help in understanding the complex and multidimensional nature of pain.		Pain
AGING			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 03**	
		DISCIPLINE	**TOPIC**
HNSS-Ag-001	Identify the role of oxidative radicals and the process of lipid peroxidation that leads to aging	Biochemistry	Lipid oxidation
HNSS-Ag-002	Familiarize with the age-related hearing loss	Otorhinolaryngology	Deafness
HNSS-Ag-003	Discuss the age changes of mandible	Anatomy	Head & Neck

Distribution and duration of teaching hours amongst disciplines



Module Weeks	Recommended Minimum Hours
05	164

Modes of Information Transfer

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

Case Based Learning (CBL)

It is an inquiry structured learning experience utilizing live or simulated patient cases to solve, or examine a clinical problem, with the guidance of a teacher and stated learning objectives.

Significance of its usage

- Induce a deeper level of learning by inculcating critical thinking skills. Flexibility on use of case
- Helps students acquire insight full information.
- Stay a breast with novel advancements in health care

Small Group Discussion (SGD)

SGD 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 view for discussion. Students point of allowing time and including self-directed, reflective learning skills

Significance of its usage

Develop and assess the extent of back ground 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.

Reflective Writing

It is a meta-cognitive process that occurs before, during and after the situation with the purpose of developing greater understanding of both the self and situation so that future encounters with the situation are informed from previous encounters.

Significance of its usage

- Questioning attitude and new perspectives.
- Areas for change and improvement.
- Respond effectively to new challenges.
- Critical thinking and coping skills

Bedside Teaching

Teachingandlearningthatoccurswithactualpatientasthefocus.Itoccursinwards, emergency departments, operating rooms, and high dependency units.

Significance of its usage

- Stimulus of clinical contact
- Psychomotor skills
- Communication skills
- Language Skills
- Interpersonal skills
- Professional attitudes and empathy
- Role modeling

Skills 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 environmentpriortotheirreal-lifeapplicationThisappliestobothbasicclinicalskills 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 learner stomach critical decisions.

Laboratory Practical

Lab practical involves things like identifying a structure, a type of stain through a microscope, a problem with preparation, reading biochemical test results and answering safety questions. These simulation sallow 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 team workabilities.

Demonstration

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 observation skills.
- Sustain interests in learning environment.
- Helps teacher to evaluate students response

Case Presentation

It is a teaching method which provides descriptive information about a clinical patient scenario and to share this educational experience with the general medical and scientific community. It prepares students for clinical practice, using authentic clinical cases by linking theory to practice with the help of inquiry-based learning methods.

Significance of its usage

- Cultivate the capacity for critical analysis.
- Judgment and Decision making
- Facilitate creative problem solving.
- Allow students to develop realistic solutions to complex problems

Assessment Strategies

Assessment tools for Theory

- Multiple Choice Questions (MCQ)
- Structured Essay Questions (SEQ)
- Reflective paper
- Assignment Presentation

Assessment tools for Practical, Clinical and Human (soft) skills

- Objective Structured
- Practical Examination
- Objective Structured Clinical Examination Structured Viva
- Short CaseLong Case
- Logbook Portfolio
- Feedback (simple and/or 360 degree)

BLOCK-5
PERLS

Code	Domain	Attribute	Specific Learning Outcome	Topic	Portfolio Entry
PERLs-2-09	Professionalis m	Responsible & Accountable	Write an anonymous report on a cheating incident in class during last year	Anonymity Misconduct	Report
PERLs-2-10			Actively demonstrate engagement in cocurricular and extracurricular activities	Advantages of cocurricular and extra-curricular activities in development of personality and social skills	Participating or organizing certificate in any of the activities
PERLs-2-11		Communicator	Write a dialogue between a senior doctor and a patient	Structure of dialogue Formatting of a dialogue Role of a dialogue in creative writing	Dialogue
PERLs-2-12		Caring & Empathic	Demonstrate respect of diversity in children with disabilities	Special needs of children with disabilities Laws and regulations for supporting persons with disabilities The government facilities for children with disabilities Daily routine of the deaf and dumb children	Visit to an institution of deaf and dumb children and reflecting on the experience in terms of interacting with them
PERLs-2-13	Ethics	Ethical Practitioner	Obtain Informed Consent from a stable patient	Informed consent Designing an informed consent form	Teacher marked proforma of informed consent for taking blood pressure, temperature or pulse rate from a stable patient
PERLs-2-14	Research	Evidence Based	Develop the summary table of all the studies	Research designs Study ty	Summary table of at least seven

		Researcher	identified after literature review on the topic	Hierarchy of evidence Critical appraisal	articles relevant to the problem
PERLs-2-15	Leadership	Self-Directed Learner	Set and track learning and improvement goals	Goal setting and Action planning in areas of research and biomedical ethics	Written Goals and action plan with milestones

READING RESOURCES

Anatomy

- MooreK.L. Clinically Oriented Anatomy. Baltimore, U.S.A. Williams, and Wilkins:
- The Developing Human by K.L. Moore.
- Snell's Clinical Neuroanatomy.
- Laiq H.S. Medical Histology. Paramount Books.

Physiology

- Guyton AC and Hall JE. Textbook of Medical Physiology. W. B. Sunders & Co., Philadelphia.

Biochemistry

- Champe, P.C. & Harvey, E.A. Biochemistry (Lippincott's Illustrated
- Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. Harper's Biochemistry. McGraw-Hill.
- ABC of Clinical genetics by H.M. Kingston.

Pathology

- Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders.
- Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pocket Companion to Pathologic basis of diseases. Saunder Harcourt.
- Walter and Israel. General Pathology. Churchill Livingstone.

Pharmacology

- Basic and Clinical Pharmacology by Katzung, Mc Graw-Hill.
- Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins

Behavioral Sciences

- Hand book of Behavioral Sciences by Prof. Mowadat H.Rana, 3rd Edition
- Integrating Behavioral Sciences in Healthcare by Asma Humayun & Michael Herbert.

Community medicine

- Parks Textbook of Preventive and Social Medicine. K.Park (Editor)
- Public Health and Community Medicine Ilyas, Ansari

lslamiyat/Pakistan studies Books

- Standard lslamiyat (Compulsory) for B.A, B.Sc., M.A, M.Sc., MBBS by Prof. M. Sharif lslahillm ilslamiyat (Compulsory) for B.A. B.Sc., & equivalent.
- Pakistan studies (Compulsory) for B.A. B.Sc., B.Com., Medical/Engineering by Prof. Shah Jahan Kahlun
- Pakistanstudies (Compulsory) for B.A, B.Sc., B.Com.,B.Ed., Medical/Engineering by Prof. Shah Jahan Kahlun