

INDEPENDENT MEDICAL COLLEGE, FSD

BLOCK-5

ENDOCRINOLOGY & REPRODUCTION - I (MODULE - 08)

CURRICULUM 2K23

(Study Guide)

MODULAR INTEGRATED
UNDERGRADUATE CURRICULUM

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LIST OF ABBREVIATION

ABBREVIATION	SUBJECTS
A	Anatomy
Ag	Aging
B	Biochemistry
BhS	Behavioral Sciences
C	Civics
CM	Community Medicine
C-FRC	Clinical-Foundation Rotation Clerkship
CV	Cardiovascular
ENT	Ear Nose Throat
F	Foundation
FM	Forensic Medicine
GO	Gynecology and Obstetrics
HL	Hematopoietic & Lymphatic
M	Medicine
MS	Musculoskeletal
O	Ophthalmology
P	Physiology
PA	Pathology
PE	Pediatrics
PERLs	Pediatrics
Ph	Pharmacology
Psy	Psychiatry
QI	Quran and Islamiyat
R	Radiology
Re	Respiratory
S	Surgery
SGD	Small Group Discussion

CURRICULUM FRAME WORK

The framework of Curriculum 2K23 has 44 modules spanning 05 years. The horizontal integration is evident in the modular configuration where different basic disciplines approach the themes simultaneously. Modules have been structured where all the basic disciplines are represented based on their respective weightage of content. All module objectives are preceded by the recommended themes and clinical relevance. Spiral placement of the modules within the framework ensures a revisit of the basic sciences. Clinical Skills follow a spiral which is entirely skills dominant. This spiral is the core of psychomotor training. 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.

INTRODUCTION O THE STUDY GUIDE

The purpose of the study guide is to organize lecture notes and text book material so that students can increase their comprehension and memory of large amount of information. It will provide a teaching aid to assist the students in developing reading skills.

INTRODUCTION TO MODULE

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 COMMITTEE

Prof. Dr. Irfan Ahmad Mughal	Anatomy (Module coordinator)
Prof. Dr. Razia Rizwan	Physiology
Dr. Rizwan Ahmad	Biochemistry
Dr. Awais Shuja	Surgery
Dr. Baddar Bashir	Medicine
Dr. Sirda Mushtaq	Pharmacology
Dr. Shahbaz Ahmad	Community Medicine
Dr. Salma Naz	Pathology
Dr. Aslam Lodhi	Psychiatry
Dr. Taimur-ul-Hassan	Medical Education

INDEPENDENT MEDICAL COLLEGE, FAISALABAD

2ND YEAR MBBS 2025

TIME TABLE

5TH BLOCK – 8TH MODULE (ENDOCRINOLOGY & REPRODUCTION - I)

07 Weeks

DAY	08:00 - 10:00	10:00 - 11:00	11:00 - 11:30	11:30 - 01:15	01:15 - 02:00	02:00 - 02:30
Mon	Physiology	Biochemistry	BREAK	Anatomy	Pathology	Self Directed Learning (SDL)
Tue	Physiology	Biochemistry		Anatomy	Community Medicine / Pharmacology	
Wed	Physiology	Biochemistry		Anatomy	Holy Quran / Pak Study	
Thu	Physiology	Biochemistry		Anatomy	PERL	
Fri	CFRC / Aging / Behavioral Sciences 8:00 - 09:00	Biochemistry 09:00 - 10:00	Anatomy 10:00 - 12:00			
Sat	Physiology 08:00 - 09:00	Anatomy 09:00 - 11:00	BREAK 11:00 - 11:30	Anatomy 11:30 - 02:00	SDL 02:00 - 02:30	

The heads of the respective departments are requested to issue the departmental schedule in accordance to the time table with intimation to the undersigned.

DISTRIBUTION OF TEACHING HOURS

Modules weeks	08
Recommended Minimum Hours	205 hr
Anatomy	64 hr
Physiology	50 hr
Biochemistry	50 hr
Pathology	12 hr
Community Medicine	08 hr
Pharmacology	04hr
Behavioral Sciences	08 hr
CFRC	08 hr
PERL	08 hr

MODULE OUTCOMES

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

LEARNING OBJECTS

BLOCK 05– ENDOCRINOLOGY & REPRODUCTION - I (MODULE – 08)

GROSS ANATOMY – THEORY	COURSE OBJECTIVES	TEACHING STRATEGIES
SPECIFIC LEARNING OUTCOMES		
Describe the location, anatomy blood supply and functions of pituitary gland		SGD
Describe the Thyroid, Parathyroid with their type, Relations, blood supply, and nerve supply.		SGD
Explain the anatomical basis for surgical removal of the glands of neck with special emphasis on the complications that can be encountered		SGD
Identify the Thyroid with their type, relations, blood supply, and nerve supply.		SGD
Describe the structure, fascia, coverings, blood and nerve supply of testis		SGD
Describe the gross anatomical features and neuro- vasculature of epididymis and vas deferens, Seminal vesicles, Bulbourethral gland		SGD
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		SGD
Describe the anatomical basis and manifestations of the following conditions: 1) Hydrocele of spermatic cord and/or testes 2) Hematocele of testes 3) Torsion of the spermatic cord 4) Varicocele 5) Vestigial remnants of embryonic genital duct		SGD
Describe the anatomical basis of vasectomy, & metastasis of cancer of testis and scrotum		SGD
Describe shape, relations blood supply & nerve supply of suprarenal gland		SGD
Explain the anatomical causes of Adrenal Abnormalities		SGD
Define Bony Pelvis (Girdle) and describe the structures forming it.		SGD
Describe the bones and salient anatomical features of Bony pelvis (girdle)		SGD
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		SGD
List the contents of True and False Pelvis		SGD
Tabulate the differences between male and female pelvis		SGD
Describe different types of pelvises		SGD
Describes different diameters of pelvis and their application in obstetric practice		SGD
Describe the anatomical basis of pelvic fractures and their consequences		SGD
Describe the topographical anatomy of pelvic walls and its components		SGD
Describe the mechanics of changes occurring in pelvic ligaments and joint mobility in late pregnancy		SGD
Describe the topographical anatomy of pelvic floor.		SGD
Describe origin, insertion, nerve supply and actions of muscle forming pelvic floor		SGD
Tabulate the attachments, innervations and actions of muscles forming the pelvic walls and floor		SGD
Describes injury to pelvic floor during child birth and its complications		SGD
Describe the peritoneal reflections in the male and female pelvis		SGD
Describe the gross anatomical features of Sacrum		SGD

Describe the gross anatomical features of pelvic fascia	SGD
Describe the boundaries of pelvic outlet and inlet	SGD
Enumerate the structures passing through the pelvic inlet and pelvic outlet	SGD
Tabulate the differences in peritoneal reflections in male and female pelvis	SGD
Describe the origin, course, branches and distribution of common iliac artery	SGD
Describe the origin, course, branches and distribution of external and internal iliac arteries	SGD
Describe the location, afferents and efferent of pelvic lymph nodes	SGD
Tabulate the origin, course, distribution and anastomosis of arteries of the pelvis	SGD
Describe the origin, root value, course, relations, branches and distribution of Pelvic nerves	SGD
Describe the anatomical basis and clinical picture for ligation of internal iliac artery and collateral circulation in pelvis	SGD
Describe the clinical picture and anatomical basis for the injury to pelvic nerves	SGD
Give anatomical justification for pelvic nerve blocks	SGD
Describe the morphological features of urethra (male and female)	SGD
Tabulate the parts of the male urethra with their location and salient features	SGD
Describe the clinical picture and anatomical justification for Ureteric Calculi, Cystocele, Suprapubic Cystotomy, Rupture of Bladder	SGD
Describe the clinical picture and anatomical justification for Hypertrophy of Prostate	SGD
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	SGD
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	SGD
Describe, identify, justify and demonstrate the supports of uterus	SGD
Describe the gross anatomical features of Boundaries & divisions of perineum	SGD
Draw and label the boundaries of perineum	SGD
List the contents of perineum	SGD
Tabulate the differences between the Male and female premium	SGD
Describe the attachments of the perineal membrane and list its relations	SGD
Discuss the formation of Superficial and Deep Perineal Pouches	SGD
List the contents of Superficial and Deep Perineal Spaces	SGD
Tabulate the attachments, actions and nerve supply of muscles of perineum	SGD
Describe the topographical anatomy and neuro-vasculature of Penis	SGD
Tabulate the muscles forming the perineal body with their attachments and nerve supply	SGD
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	SGD

8) Rectal Examination 9) Disposition Of Uterus	
EMBRYOLOGY & POST-NATAL DEVELOPMENT SPECIFIC LEARNING OUTCOMES	TEACHING STRATEGIES
Describe the contributing factors, histogenesis and sequence of events of the development of Thyroid gland	Interactive Lectures
Explain the embryological basis of the Thyroglossal Cyst	Interactive Lectures
Draw a concept map highlighting the development of thyroid gland	Interactive Lectures
Describe the development of para-thyroid glands	Interactive Lectures
Draw a concept map highlighting the development of para-thyroid gland	Interactive Lectures
Anatomically justify the clinical presentation of: 1. Ectopic Parathyroid 2. Aberrant Thyroid	Interactive Lectures
Describe the development of pituitary gland Describe the embryological basis for the congenital anomalies of pituitary development	Interactive Lectures
Describe the contributing factors, histogenesis and the development of adrenal gland	Interactive Lectures
Draw a concept map for the development of adrenal gland	Interactive Lectures
Describe the embryological basis for the congenital anomalies of adrenal development	Interactive Lectures
Identify the stages in the development of the adrenal gland	Interactive Lectures
Describe the indifferent gonads	Interactive Lectures
List and describe the Factors influencing the differentiation of gonads	Interactive Lectures
Evaluate the role of the factors influencing Sex determination and differentiation	Interactive Lectures
Describe the Development and descent of testis	Interactive Lectures
Describe the embryological basis and locations of undescended testes	Interactive Lectures
Draw a concept map highlighting the development of testis	Interactive Lectures
Explain the Development and descent of ovaries	Interactive Lectures
Draw a concept map highlighting the development of ovaries	Interactive Lectures
Describe the anatomical basis for indifferent gonads, Klinefelter, turner syndromes & androgen insufficiency	Interactive Lectures
Describe the Formation of Genital Ducts In different stage (paramesonephric and mesonephric ducts)	Interactive Lectures
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	Interactive Lectures
Describe the development of male genital ducts and glands	Interactive Lectures
Discuss the Development of male external genitalia	Interactive Lectures
Describe the Development of female external genitalia	Interactive Lectures
Explain the anatomical basis for the Associated congenital anomalies of male and female external genitalia (Hypospadiasis, Epispadiasis)	Interactive Lectures
Describe the development of inguinal canal and descent of testis and embryological basis for Cryptorchidism, Ectopic Testis, Congenital Inguinal Hernia, Hydrocele	Interactive Lectures
Klinefelter, turner syndromes & androgen insufficiency Describe the embryological basis for the coverings of testis	Interactive Lectures

MICROSCOPIC STRUCTURE (HISTOLOGY & PATHOLOGY)	TEACHING STRATEGIES
SPECIFIC LEARNING OUTCOMES	
Describe the histological basis and manifestation of Gastric Carcinoid Tumors	Interactive Lectures
Classify the principal Enteroendocrine Cells on the basis of type, location, hormone produced and Actions	Interactive Lectures
Describe microscopic structure of Pituitary gland.	Interactive Lectures
Classify pituitary gland on the basis of cell type, hormone produced and functions	Interactive Lectures
Explain the histological basis and manifestation of Pituitary Adenomas	Interactive Lectures
Describe the light microscopic structure of Adrenal Gland	Interactive Lectures
Explain the histological basis and manifestation of Addison disease	Interactive Lectures
Describe the light microscopic structure of endocrine pancreas	Interactive Lectures
Classify the pancreatic islets on the basis of cell type, hormone produced and functions	Interactive Lectures
Explain the histological basis and manifestation of Diabetes Mellitus	Interactive Lectures
Explain the components and functions of neuroendocrine system	Interactive Lectures
Describe the light microscopic structure of Thyroid Gland	Interactive Lectures
Describe the light microscopic structure of Parathyroid Gland	Interactive Lectures
Describe the light microscopic structure of Pineal gland	Interactive Lectures
Describe the light and ultramicroscopic structure of Testes, structure & function of Sertoli cells. Describe Blood testes Barrier	Interactive Lectures
Describe the histological basis and manifestation of Orchitis, Cryptorchidism	Interactive Lectures
Describe the light microscopic structure of Epididymis	Interactive Lectures
Describe the light microscopic structure of vas deferens	Interactive Lectures
Describe the light microscopic structure of seminal vesicle	Interactive Lectures
Describe the light microscopic structure of Prostate Gland	Interactive Lectures
Describe the lobes of prostate and correlate with the pathologies of prostate	Interactive Lectures
Describe the light microscopic structure of ovaries	Interactive Lectures
Describe the light microscopic structure of ovarian follicles in different stages of menstrual cycle.	Interactive Lectures
Describe the histological basis and manifestation of Polycystic Ovary Syndrome	Interactive Lectures
Discuss the light microscopic structure of uterus	Interactive Lectures
Describe the light microscopic structure of different stages of Menstrual cycle	Interactive Lectures
Describe the histological basis and manifestation of Endometriosis	Interactive Lectures
Describe the light microscopic structure of Fallopian Tube.	Interactive Lectures
Describe the light microscopic structure of Cervix	Interactive Lectures
Describe the histological basis and manifestation of Cervical Carcinoma	Interactive Lectures
Describe the light microscopic structure of Vagina	Interactive Lectures
Describe light microscopic structure of mammary gland (inactive, during pregnancy, after lactation) Discuss histological basis of Breast cancer	Interactive Lectures
PRACTICAL	HISTOLOGY
SPECIFIC LEARNING OBJECTIVES	TEACHING STRATEGIES
Identify draw & Label the Pituitary gland under light microscope	Practical
Identify draw & label the Thyroid & Parathyroid glands under light microscope	Practical
Identify draw & Label the Adrenal gland under light microscope	Practical
Identify draw & Label Testes, Epididymis & Vas deferens under the light Microscope	Practical
Identify draw & label the seminal vesicle & prostate gland under light Microscope	Practical
Identify, draw and label the ovaries under light microscope	Practical
Identify, draw and label the slide of different phases of uterus under light microscope	Practical
Identify, draw and label the fallopian tube under light microscope	Practical
Identify, draw and label the cervix under light microscope	Practical
Identify, draw and label the vagina under light microscope	Practical
Identify, draw and label the mammary gland (different stages) under light microscope	Practical

MEDICAL PHYSIOLOGY - THEORY SPECIFIC LEARNING OUTCOMES	COURSE OBJECTIVES	TEACHING STRATEGIES
<p>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.</p>		Interactive Lectures / SGD
<p>Explain the mechanism of intracellular signaling after hormone receptor activation. Name the hormones that use enzyme-linked hormone receptors signaling. Explain the mechanism of enzyme linked receptors. Enlist second messenger mechanisms for mediating intracellular hormonal functions. Define second messenger system. Explain the adenylyl cyclase– cAMP Second Messenger System. Enumerate the hormones that use the adenylyl cyclase– cAMP Second Messenger System. Explain The cell membrane phospholipid second messenger System. Enumerate the hormones that use cell membrane phospholipid second messenger system. Explain the mechanism of calcium Calmodulin system.</p>		Interactive Lectures / SGD
<p>Name the hormones/ factors of hypothalamus. Name the hormones of anterior pituitary. Name the hormones of posterior pituitary. Describe the functional relationship between hypothalamus, anterior and posterior pituitary gland. Explain the significance of hypothalamic- hypophysial portal circulation. Explain the hypothalamic pituitary tract. Explain the mechanism of action of growth hormone. Explain the actions of Growth hormone on Carbohydrate. Discuss the actions of Growth hormone on protein metabolism. Describe the actions of Growth hormone on fat metabolism.</p>		Interactive Lectures / SGD
<p>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.</p>		Interactive Lectures / SGD
<p>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</p>		Interactive Lectures / SGD
<p>Explain the features, pathophysiology and treatment of thyrotoxicosis/ grave’s disease Explain the thyroid function test to investigate hypo and hyperthyroidism Enlist the causes of hypothyroidism</p>		Interactive Lectures / SGD

<p>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</p>	
<p>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 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.</p>	<p>Interactive Lectures / SGD</p>
<p>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.</p>	<p>Interactive Lectures / SGD</p>
<p>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.</p>	<p>Interactive Lectures / SGD</p>
<p>Enlist the types of diabetes mellitus Explain the causes of Type I and type II diabetes mellitus Discuss the features and pathophysiology of diabetes mellitus Explain the role of insulin resistance, obesity and metabolic syndrome in developing type II diabetes mellitus Explain how to diagnose the diabetes mellitus Explain the treatment of type I and type II diabetes mellitus Explain the features, cause of insulinoma</p>	<p>Interactive Lectures / SGD</p>
<p>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</p>	<p>Interactive Lectures / SGD</p>
<p>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</p>	<p>Interactive Lectures / SGD</p>

Enumerate the causes and features of osteoporosis	
Enlist the functions of adrenal medullary hormones and explain pheochromocytoma	Interactive Lectures / SGD
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	Interactive Lectures / SGD
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	Interactive Lectures / SGD
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	Interactive Lectures / SGD
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	Interactive Lectures / SGD
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	Interactive Lectures / SGD
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	Interactive Lectures / SGD
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	Interactive Lectures / SGD
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	Interactive Lectures / SGD
PHYSIOLOGY - PRACTICAL	COURSE OBJECTIVES
SPECIFIC LEARNING OUTCOMES	TEACHING STRATEGIES
Perform Pregnancy test	Practical

BIOCHEMISTRY - THEORY	COURSE OBJECTIVES	TEACHING STRATEGIES
SPECIFIC LEARNING OUTCOMES		
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.		Interactive Lectures / SGD

<p>Name the hormones that use enzyme-linked hormone receptors signaling. Explain the mechanism of enzyme linked receptors. Explain the mechanism of hormones that receptors present in cytoplasm and nucleus (act on genetic machinery). Enlist second messenger mechanisms for mediating intracellular hormonal functions. Define second messenger system. Explain the adenylyl cyclase– cAMP Second Messenger System. Enumerate the hormones that use the adenylyl cyclase– cAMP Second Messenger System. Explain The cell membrane phospholipid second messenger System. Enumerate the hormones that use cell membrane phospholipid second messenger system. Explain the mechanism of calcium Calmodulin system.</p>	
Describe the features of Signal transduction Describe different types of receptors	Interactive Lectures / SGD
Discuss the classification of hormones	Interactive Lectures / SGD
<p>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</p>	Interactive Lectures / SGD
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	Interactive Lectures / SGD
Interpret disorders of hormones on the basis of sign, symptoms and given data	Interactive Lectures / SGD
Explain the synthesis, secretion, transport and clearance of steroid and protein hormones.	Interactive Lectures / SGD
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.	Interactive Lectures / SGD
Explain the structure, biosynthesis, secretion, transport, regulation, catabolism, mechanism of action and biochemical role of testosterone, progesterone and estrogen	Interactive Lectures / SGD
Discuss the role of steroid hormones in oral contraception, Infertility	Interactive Lectures / SGD
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	Interactive Lectures / SGD
Discuss the structures of genes, how they are organized and regulated.	Interactive Lectures / SGD
Describe Mendelian Law of Segregation and Law of Independent Assortment.	Interactive Lectures / SGD
Describe the patterns of inheritance characteristic of autosomal dominant, autosomal recessive, X- linked dominant, X-linked recessive and mitochondrial traits.	Interactive Lectures / SGD
<p>Analyze pedigree to determine the mode of inheritance of following traits:</p> <ol style="list-style-type: none"> 1) X-linked recessive (Duchenne Muscular dystrophy) 2) X-linked dominant (Rickets) 3) Autosomal recessive (Xeroderma Pigmentosum) 	Interactive Lectures / SGD

4) Autosomal dominant (Huntington's Disease)) Mitochondrial disorder (Mitochondrial diabetes)	
Discuss different structural and numerical chromosomal abnormalities.	Interactive Lectures / SGD
Interpret the normal human karyotype in terms of number and structure of chromosomes.	Interactive Lectures / SGD
Describe the effect of the following chromosomal mutations on a segment of DNA: point mutation, frameshift mutation, deletion, insertion, inversion, Robertsonian Translocation and mosaicism.	Interactive Lectures / SGD
Discuss the concept of central dogma from gene to protein (replication, transcription and translation)	Interactive Lectures / SGD
Discuss the gene expression especially Lac operon and Tryptophan operon	Interactive Lectures / SGD
Discuss the regulation of eukaryotic gene expression with special emphasis on iron metabolism and RNA interference	Interactive Lectures / SGD
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	Interactive Lectures / SGD
BIOCHEMISTRY - PRACTICAL	COURSE OBJECTIVES
SPECIFIC LEARNING OUTCOMES	TEACHING STRATEGIES
Perform DNA extraction	Practical
Perform Electrophoresis	Practical
Perform PCR	Practical
Demonstrate ELISA (enzyme-linked immunoassay) to measure concentration of hormones	Practical

AGING - THEORY	COURSE OBJECTIVES	TEACHING STRATEGIES
SPECIFIC LEARNING OUTCOMES		
Enlist the changes that occur in female body after menopause.		Gynae & Obs Lecture

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS	THEORY	TEACHING STRATEGIES
COURSE OBJECTIVES		
SPECIFIC LEARNING OUTCOMES		
Enumerate clinical manifestations along with hormone levels of anterior pituitary Classification of pituitary adenomas		Pathology Lecture
Enumerate and describe posterior pituitary syndromes (inappropriate ADH (Anti Diuretic Hormone) secretion, diabetes insipidus)		Pathology Lecture
Enumerate causes of hypo and hyperthyroidism along with levels of thyroid hormones		Pathology Lecture
Enumerate causes of hypercalcemia, hyper and hypoparathyroidism		
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 Lecture
Enumerate causes of Cushing syndrome with lab investigations Causes and clinical features of adrenocortical insufficiency (Addison		Pathology Lecture

disease)	
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 Lecture
Enumerate causes of inflammation of male genital tract Causes of male infertility with semen analysis Describe pathological features of testicular torsion	Pathology Lecture
Explain the mechanism of action of thyroxine Explain Clinical uses and potential adverse effects with use of Thyroxine	Pharmacology Lecture

DISEASE PREVENTION & IMPACT	THEORY	TEACHING STRATEGIES
COURSE OBJECTIVES SPECIFIC LEARNING OUTCOMES		
Define Diabetes Mellitus according to WHO (World Health Organization) criteria Classify types of Diabetes Mellitus		Community Medicine Lecture
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 Lecture
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 Lecture
Define women health and life cycle approach for health-related events. Highlight statistics related to human reproductive health issues. Enumerate health related problems across a woman's reproductive lifetime. Explain the components of reproductive health.		Community Medicine Lecture
Discuss common sexual dysfunctions and their prevalence, with emphasis on culture bound syndromes. Identify the various biological, psychological, and relational factors that can contribute to sexual difficulties. Discuss barriers to seek help. Discuss the importance of person centered and nonjudgmental approach when discussing sexual health concerns. Explain the ethical obligations of healthcare professionals in respecting patient confidentiality and informed consent when addressing sexual health issues.		Behavioral Sciences Lecture

ASSESSMENT
INTERNAL ASSESSMENT
BLOCK - 5

(Total 70 Marks)

THEORY		
S. No	Scoring Parameter	Marks out of 35
1.	Attendance >91% = 2 Marks 85-90% = 1 Mark	02 Marks
2.	Block Exam 71-onwards = 7 Marks 66-70 = 7 Marks 61-65 = 7 Marks 55-60 = 6 Marks	27 Marks
3.	Portfolio, Professional Behavior, Leadership Trait	03 Marks
4.	Continuous Assessment (Formative) – 3 Modules (only Pass)	03 Marks

PRACTICAL AND BEHAVIORAL ASSESSMENT		
S. No	Scoring Parameter	Marks out of 35
1.	Attendance >91% = 2 Marks 85-90% = 1 Mark	02 Marks
2.	Summative Assessment (Block Exam) OSPE / Practical 71-onwards = 7 Marks 66-70 = 7 Marks 61-65 = 6 Marks 55-60 = 6 Marks	26 Marks
3.	Practical books / Clinical Logbooks	07 Marks

DATE SHEET

PROPOSED DATE SHEET FOR 5TH BLOCK EXAMINATION		
SUBJECT	WRITTEN	
Following is the schedule of 8th Module Test		
Anatomy	(24-July-2025)	
Physiology	(26-July-2025)	
Biochemistry	(28-July-2025)	
Following is the schedule of 5TH Block Examination.		
WRITTEN	OSPE	VIVA
20-Septembet-2025	22- Septembet-2025	Anatomy 23- Septembet-2025 Physiology 24- Septembet-2025 Biochemistry 25- Septembet-2025

ASSESSMENT TOOLS

MCQS

SEQS

OSPE

OSCE

VIVA

MARKS DISTRIBUTION

MBBS 2ND PROFESSIONAL BLOCK - 5

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE/OSCE/Viva Stations			Marks
					OSPE (08 marks each Observed)	OSCE (05 marks each Observed)	OSVE (14 marks each Observed)	
Normal Structure	Anatomy & applied/clinical	30	04	50	04	-	01	46
Normal Function	Physiology & applied/clinical	20	04	40	03	-	01	38
	Biochemistry & applied/clinical	14	01	19	01	-	01	22
Disease Burden & Prevention	Community Medicine & Public Health	07	-	07	-	-	-	0
	Behavioral Sciences	04	-	04	-	-	-	0
Pathophysiology and Pharmacotherapeutics	Pathology	13	01	18	02	-	-	16
	Pharmacology	02	-	02	01	-	-	08
CFRC	CF 1-1	-	-	-	-	01	-	05
PERLs	PERLs 1-1	-	-	-	-	01	-	05
		90	10 x 5 = 50	140	11 Stations x 08 = 88	2 Stations x 05 = 10	3 Stations x 14 = 42	140

INDEPENDENT MEDICAL COLLEGE, FSD

BLOCK-5

HEAD & NECK, SPECIAL SENSES - (MODULE – 9)

CURRICULUM 2K23

(Study Guide)

MODULAR INTEGRATED
UNDERGRADUATE CURRICULUM

INTRODUCTION TO THE MODULE

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 COMMITTEE

Prof. Dr. Irfan Ahmad Mughal	Anatomy (Coordinator Integrated Curriculum)
Prof. Dr. Razia Rizwan	Physiology (Module Coordinator)
Dr. Rizwan Ahmad	Biochemistry
Dr. Awais Shuja	Surgery
Dr. Baddar Bashir	Medicine
Dr. Sirda Mushtaq	Pharmacology
Dr. Shahbaz Ahmad	Community Medicine
Dr. Salma Naz	Pathology
Dr. Aslam Lodhi	Psychiatry
Dr. Taimur-ul-Hassan	Medical Education

INDEPENDENT MEDICAL COLLEGE, FAISALABAD

2ND YEAR MBBS 2025

TIME TABLE

5TH BLOCK – 9TH MODULE (HEAD & NECK, SPECIAL SENSES)

05 Weeks

DAY	08:00 - 10:00	10:00 - 11:00	11:00 - 12:00	12:00 - 12:15	12:15 - 01:15	01:15 - 02:00	02:00 - 02:30
Mon	Anatomy	Physiology	Physiology	BREAK	Anatomy	Pathology	Self Directed Learning (SDL)
Tue	Anatomy	Physiology	Physiology		Anatomy	Community Medicine / CFRC	
Wed	Anatomy	Biochemistry	Physiology		Anatomy	Holy Quran / Pak Study	
Thu	Anatomy	Biochemistry	Physiology		Anatomy	PERL	
Fri	Physiology 8:00 - 09:00	Behavioral Sciences 09:00 - 10:00	Anatomy 10:00 - 12:00				
Sat	Anatomy 08:00 - 10:00	Physiology 10:00 - 11:00	Biochemistry 11:00 - 12:00	BREAK 12:00 - 12:15	Anatomy 12:15 - 02:00		SDL 02:00 - 02:30

The heads of the respective departments are requested to issue the departmental schedule in accordance to the time table with intimation to the undersigned.

DISTRIBUTION OF TEACHING HOURS

Modules weeks	03
Recommended Minimum Hours	71 hr
Anatomy	05 hr
Physiology	26 hr
Biochemistry	28 hr
Pathology	05 hr
Community Medicine	04 hr
Pharmacology	02 hr
Behavioral Sciences	01 hr
CFRC	03 hr
PERL	03 hr

MODULE OUTCOMES

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

LEARNING OBJECTS

BLOCK 5 – (HEAD & NECK, SPECIAL SENSES) MODULE – 9

GROSS ANATOMY – THEORY	COURSE OBJECTIVES	TEACHING STRATEGIES
SPECIFIC LEARNING OUTCOMES		
Define the boundaries and openings of orbital cavity. List orbital contents and structures traversing these openings.		SGD
In a tabulated manner list the extraocular and intraocular muscles of eyeball giving their nerve supply and actions		SGD
List and define the movements of eyeball with special reference to orbital and visual axis		SGD
Describe the functional modalities, course, distribution, branches of oculomotor, trochlear and abducent nerve. Describe the location, roots and distribution of ciliary ganglion.		SGD
Describe the course and distribution of optic nerve in reference to visual pathway. Give the effects of its lesions.		SGD
Give the clinical correlates of nerves supplying the eyeball and its muscles. Give anatomical justification for Horner's syndrome.		SGD
Describe the course and branches of ophthalmic artery mentioning its origin and termination.		SGD
Describe the structure of eyelids, conjunctiva and tarsal glands with their neurovascular supply		SGD
List the parts of Lacrimal apparatus giving their location and anatomical features. Describe the nerve supply of lacrimal gland.		SGD
Describe the location, roots and distribution of pterygopalatine ganglia.		SGD
Give the anatomical structure of eyeball emphasizing on its three coats and their neurovascular supply		SGD
Describe the boundaries of nasal cavity: nasal septum, lateral wall of nose, roof and floor. Give their anatomical features and neurovascular supply.		SGD
Describe the anatomical features and neurovascular supply of external nose		SGD
List the paranasal sinuses giving their locations, openings, neurovascular supply and clinical significance.		SGD
Describe the course and distribution of olfactory nerve in reference to olfactory pathway. Give the effects of its lesions.		SGD
Describe the anatomical features and neurovascular supply of external ear		SGD
Describe the boundaries, contents, neurovascular supply and communications of middle ear cavity.		SGD
Describe the parts, anatomical features and neurovascular supply of internal ear.		SGD
Describe the course and distribution of vestibulocochlear nerve mentioning the effects of its lesion. Describe auditory pathway.		SGD
Describe the anatomical features of tongue with emphasis on its mucosa, attachments, musculature, vascular supply and lymphatic drainage.		SGD
Describe the nerve supply of tongue (general sensory, special sensory and motor) with reference to their lesions and embryological basis.		SGD

List taste buds mentioning their structure, location and nerve supply. Describe the taste pathway.	SGD
Discuss lesions of motor and sensory nerves supplying the tongue. Discuss the anatomical correlates of lingual carcinoma in reference to lymphatic drainage of tongue.	SGD
Describe the features of Norma Frontalis, Norma Verticalis, Norma Parietalis, Norma occipitalis and Norma Basalis	SGD
Describe the features of Norma lateralis: temporal, infratemporal & pterygopalatine fossae giving their boundaries, contents and communications.	SGD
Discuss the sutures and fontanelles of skull, their age changes and clinical significance.	SGD
List the layers of scalp and describe the anatomical features with neurovascular supply and lymphatic drainage of scalp.	SGD
Give anatomical justification of spread of scalp infections, profuse bleeding in superficial scalp lacerations, gaping of scalp wounds and black eye.	SGD
Enlist in tabulated manner the muscles of facial expression and mastication, giving their nerve supply and actions. Define modiolus.	SGD
Describe the functional modalities, course, branches, and distribution of cranial nerves innervating the face (sensory and motor): trigeminal and facial nerves	SGD
Describe the vascular supply and lymphatic drainage of face.	SGD
Draw a diagram to illustrate cutaneous innervation of face.	SGD
Discuss anastomoses of facial artery with contralateral vessels and branches of internal carotid artery with their clinical significance.	SGD
Describe the danger area of face with its clinical significance. Define the routes of spread of infection from face and scalp to intracranially.	SGD
Describe the bony features and muscle attachment of mandible.	SGD
Classify temporomandibular joint mentioning its ligaments, relations, nerve supply and movements (with their mechanics and muscles producing them).	SGD
Describe anatomical features, relations and neurovascular supply of parotid gland and its duct, mentioning the structures entering and exiting the gland	SGD
Discuss the clinical correlates of parotid gland: parotiditis, Mumps, Frey's syndrome, parotid duct stones and parotid tumor surgery with its complications	SGD
Describe the parts and boundaries of oral cavity and give its relation to the Waldeyer's ring.	SGD
Describe the anatomical features of hard and soft palate with their neurovascular supply.	SGD
Describe anatomical features, relations and neurovascular supply of submandibular and sublingual glands with their ducts.	SGD
Describe the location, roots and distribution of otic and submandibular ganglia.	SGD
Describe the anatomical features of Hyoid bone and give attachments on the bone.	SGD
Enumerate the types of cervical vertebrae and list the differences between them. Describe the anatomical features and attachments on cervical vertebrae.	SGD
Classify the joints of cervical vertebrae mentioning their ligaments, movements with muscle producing them and neurovascular supply.	SGD
List the prevertebral muscles of cervical region. Describe their attachments, actions and innervation.	SGD
Enumerate parts of deep cervical fascia with their respective extents, attachments, relations and contents.	SGD
Describe the facial spaces in head and neck mentioning their communications and their relation to spread of infection.	SGD
Describe the attachments, actions and nerve supply of infrahyoid and suprahyoid muscles of neck.	SGD
Describe the location, formation and distribution of ansa cervicalis.	SGD
Describe the attachments, actions and nerve supply of sternocleidomastoid and trapezius.	SGD
Describe the boundaries and contents of suboccipital, anterior and posterior triangles of	SGD

neck.	
Describe the cervical part of trachea and esophagus with their neurovascular supply.	SGD
Describe the location, anatomical features and vascular supply of thyroid and parathyroid glands. List the variations in location of parathyroid glands.	SGD
Describe the carotid arteries mentioning their origin, course, branches, distribution and termination.	SGD
Describe carotid body and carotid sinus and give their clinical significance.	SGD
Give the venous drainage of Head and Neck region. Describe the formation, tributaries and area of drainage of vessels constituting jugular venous system.	SGD
Name the superficial and deep cervical lymph nodes and give their location and drainage areas	SGD
Describe the location, formation, branches, distribution and lesions of cervical plexus	SGD
Name the parts of pharynx giving their extent, anatomical features, structure and neurovascular supply.	SGD
Name the pharyngeal constrictor muscles defining their attachments, innervation and structure traversing the gaps between adjacent muscles.	SGD
Name the parts of larynx giving their extent, anatomical features, musculoskeletal framework and neurovascular supply.	SGD
Discuss the location, anatomical features, relations and vascular supply of tonsils: nasopharyngeal, palatine and lingual.	SGD
EMBRYOLOGY & POST-NATAL DEVELOPMENT SPECIFIC LEARNING OUTCOMES	TEACHING STRATEGIES
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.	Interactive Lectures
Describe the development and histogenesis of auditory tube, tympanic cavity, tonsils, thymus and parathyroid	Interactive Lectures
Discuss the embryological basis of congenital anomalies related to the development of pharyngeal arches, pharyngeal clefts and pharyngeal pouches: cervical sinus/fistula/cyst, 1 st arch syndrome, DiGeorge syndrome, congenital malformations of thymus and parathyroid glands	Interactive Lectures
Describe the development of tongue and thyroid gland.	Interactive Lectures
List and provide embryological basis of congenital anomalies of tongue and thyroid gland.	Interactive Lectures
Describe the development of face and nasolacrimal duct and their respective congenital anomalies.	Interactive Lectures
Describe the development of nasal cavity and paranasal sinuses. Give the associated congenital anomalies.	Interactive Lectures
Describe the development of lip and palate and their associated congenital malformations.	Interactive Lectures
Explain the types and embryologic basis of cleft lip and cleft palate.	Interactive Lectures
Describe the development of optic vesicle and retina.	Interactive Lectures
Describe the development of cornea, sclera, choroid, iris, ciliary body and lens and relate it to their respective congenital anomalies.	Interactive Lectures
Describe the development of internal ear and give the embryological basis of associated congenital anomalies.	Interactive Lectures
MICROSCOPIC ANATOMY (HISTOLOGY & PATHOLOGY) SPECIFIC LEARNING OUTCOMES	TEACHING STRATEGIES
Describe the light and electron microscopic structure of tongue mentioning the histological structure of lingual papillae and taste buds.	Interactive Lectures
Describe the histological structure of parotid, submandibular and sublingual glands.	Interactive Lectures
Compare and contrast the histological structures of parotid, submandibular and sublingual	Interactive Lectures

glands.	
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.	Interactive Lectures
Describe the histological structure of thyroid gland and parathyroid gland.	Interactive Lectures
Describe the histological structure of layers of eyeball, eyelid and retina.	Interactive Lectures
Describe the light and electron microscopic structure of cornea	Interactive Lectures
Describe the histological and ultramicroscopic structure of internal ear with special reference to Organ of Corti.	Interactive Lectures
PRACTICAL	HISTOLOGY
SPECIFIC LEARNING OBJECTIVES	TEACHING STRATEGIES
Identify, draw and label diagrams to show histological structure of tongue, lingual papillae and taste buds.	Practical
Identify, draw and label a diagram to show histological structure of parotid, submandibular and sublingual glands.	Practical
Draw and label diagrams to show histological structure of serous demilunes, serous and mucous acini.	Practical
Draw and label a diagram to show histological structure of thyroid and parathyroid gland.	Practical
Draw and label diagrams to show histological structure of eyelid and cornea.	Practical
Draw and label a diagram to show histological structure of retina. List its histological layers and their respective components	Practical
Draw and label a diagram to show histological structure of internal ear.	Practical

MEDICAL PHYSIOLOGY – THEORY	COURSE OBJECTIVES	TEACHING STRATEGIES
SPECIFIC LEARNING OUTCOMES		
Define and describe the visual acuity		Interactive Lectures / SGD
Define Emmetropia		Interactive Lectures / SGD
Enlist the errors of refraction		Interactive Lectures / SGD
Explain the cause, features, physiological basis, and correction of Hyperopia		Interactive Lectures / SGD
Explain the cause, features, physiological basis, and correction of myopia		Interactive Lectures / SGD
Explain the cause, features, physiological basis, and correction of astigmatism		Interactive Lectures / SGD
Describe the pathophysiology and treatment of cataract		Interactive Lectures / SGD
Interpret common treatment modalities for Refractive errors		Interactive Lectures / SGD
Describe the mechanism of formation and outflow of aqueous humor		Interactive Lectures / SGD
Describe normal value of intraocular pressure and its regulation Describe the method for measuring the intraocular pressure Describe the causes and features and pathophysiology of glaucoma		Interactive Lectures / SGD
Discuss the clinical features of Open Angle and Angle Closure Glaucoma		Interactive Lectures / SGD
Describe the physiological anatomy and function of structural elements of retina		Interactive Lectures / SGD
Enlist different layers of retina		Interactive Lectures / SGD

Explain the significance of melanin pigment in retina	Interactive Lectures / SGD
Describe macula and foveal region of retina and their significance	Interactive Lectures / SGD
Describe the structure of rods and cones	Interactive Lectures / SGD
Comment on the location of optic disc and its significance	Interactive Lectures / SGD
Describe the cause, features, and treatment of retinal detachment	Interactive Lectures / SGD
Enlist the current investigations for Retinal Diseases	Interactive Lectures / SGD
Describe the rhodopsin-retinal visual cycle	Interactive Lectures / SGD
Describe the mechanism of excitation of rods/ rods receptor potential	Interactive Lectures / SGD
Describe the causes and treatment of night blindness	Interactive Lectures / SGD
Define and describe different mechanisms of light adaptation	Interactive Lectures / SGD
Define and describe different mechanisms of dark adaptation	Interactive Lectures / SGD
Enumerate the diseases leading to Night Blindness and retinal detachment	Interactive Lectures / SGD
Explain the tri color mechanism of color determination	Interactive Lectures / SGD
Define term protanopes, deuteranopes, tritanopes	Interactive Lectures / SGD
Enlist the types of color blindness and their causes	Interactive Lectures / SGD
Enlist clinical features of Color vision deficiencies	Interactive Lectures / SGD
Trace the visual pathway	Interactive Lectures / SGD
Enlist and describe the abnormalities of visual pathway & visual field	Interactive Lectures / SGD
Explain the effect of removal of primary visual cortex	Interactive Lectures / SGD
Define the physiological blind spot and describe its location	Interactive Lectures / SGD
Define scotoma/ pathological blind spot and enlist causes	Interactive Lectures / SGD
Illustrate the abnormalities of field of vision	Interactive Lectures / SGD
Describe the muscular and neural control of eye movements	Interactive Lectures / SGD
Define and enlist the types of Strabismus	Interactive Lectures / SGD
Explain the mechanism of accommodation	Interactive Lectures / SGD
Enlist the components of near response in accommodation	Interactive Lectures / SGD
Describe the neural pathway for accommodation reflex	Interactive Lectures / SGD

Describe the regulation of accommodation	Interactive Lectures / SGD
Enlist the clinical features of Presbyopia	Interactive Lectures / SGD
Trace the neural pathway for pupillary light reflex	Interactive Lectures / SGD
Explain the pupillary light reflexes or reactions in CNS diseases	Interactive Lectures / SGD
Describe the cause and features of Horner syndrome	Interactive Lectures / SGD
Illustrate the differential diagnosis of Anisocoria	Interactive Lectures / SGD
Describe the physiological anatomy of outer and middle ear	Interactive Lectures / SGD
Enlist the functions of middle ear	Interactive Lectures / SGD
Discuss clinical features and treatment of impacted wax	Interactive Lectures / SGD
Define causes and clinical features of Otomycosis	Interactive Lectures / SGD
Describe the mechanism of impedance matching and its significance	Interactive Lectures / SGD
Describe the mechanism of attenuation reflex and its significance	Interactive Lectures / SGD
Describe the physiological anatomy of inner ear	Interactive Lectures / SGD
Describe the mechanism of transmission of sound waves in cochlea	Interactive Lectures / SGD
Describe the physiological anatomy and function of organ of Corti	Interactive Lectures / SGD
Describe the mechanism of generation of endo-cochlear potential and its significance	Interactive Lectures / SGD
Write down the normal range of frequency for hearing	Interactive Lectures / SGD
Describe the role of place principle in determination of sound frequency	Interactive Lectures / SGD
Describe the role of volleys principle in determination of sound frequency	Interactive Lectures / SGD
Trace the normal auditory nervous pathway	Interactive Lectures / SGD
Describe the types of deafness	Interactive Lectures / SGD
Discuss the clinical features and investigations of Congenital and Acquired hearing loss	Interactive Lectures / SGD
Enlist the primary taste sensations	Interactive Lectures / SGD
Define and explain the term taste blindness Describe the physiological anatomy and location of taste buds	Interactive Lectures / SGD
Describe the mechanism of stimulation of taste buds/receptor potential	Interactive Lectures / SGD
Trace the pathway of taste sensation	Interactive Lectures / SGD
Define and explain the terms: Ageusia, Hypergeusia, Hypogeusia and dysgeusia	Interactive Lectures / SGD

Describe the senile changes in taste buds	Interactive Lectures / SGD
Explain the terms: Taste preference and taste aversion	Interactive Lectures / SGD
Enlist the primary sensations of smell	Interactive Lectures / SGD
Describe the physiological anatomy and location of olfactory membrane	Interactive Lectures / SGD
Enlist the causes and clinical features of Rhinitis	Interactive Lectures / SGD
Differentiate between viral and allergic Rhinitis	Interactive Lectures / SGD
PHYSIOLOGY	PRACTICAL
SPECIFIC LEARNING OUTCOMES	TEACHING STRATEGIES
Examine the Second, Third, Fourth & Sixth Cranial Nerves	Physiology Practical
Examination of Light Reflex	Physiology Practical
Determine the Visual Acuity for Far and Near vision	Physiology Practical
Perform Ophthalmoscopy	Physiology Practical
Examine Field of Vision and interpretation of visual field plotted	Physiology Practical
Examine Color Vision	
Perform Tuning fork test and audiometry, interpret the report	Physiology Practical

BIOCHEMISTRY - THEORY	COURSE OBJECTIVES	TEACHING STRATEGIES
SPECIFIC LEARNING OUTCOMES		
Discuss the metabolism of mono and disaccharides		Interactive Lectures / SGD
Interpret Hereditary fructose intolerance, fructosuria, galactosemia and lactose intolerance, in relevance to the clinical findings		Interactive Lectures / SGD
Explain the Polyol pathway and effect of hyperglycemia on sorbitol pathway		Interactive Lectures / SGD
Discuss the sources, metabolically active forms, biochemical role and clinical correlation of Vit-A with vision		Interactive Lectures / SGD
Discuss biochemical basis and clinical aspects of Riboflavin		Interactive Lectures / SGD
Discuss the sources, absorption, regulation, biomedical functions and clinical aspect of Zn, Fl		Interactive Lectures / SGD
BIOCHEMISTRY - PRACTICAL	COURSE OBJECTIVES	TEACHING STRATEGIES
SPECIFIC LEARNING OUTCOMES		
Perform estimation of uric acid level in blood		Biochemistry Practical
Perform HbA1C by chromatographic method		Biochemistry Practical
Detect abnormal constituents in urine by chemical methods		Biochemistry Practical

AGING -	THEORY	TEACHING
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COURSE OBJECTIVES SPECIFIC LEARNING OUTCOMES	STRATEGIES
Identify the role of oxidative radicals and the process of lipid peroxidation that leads to aging	Biochemistry Lecture
Familiarize with the age-related hearing loss	Otorhinolaryngology Lecture
Discuss the age changes of mandible	Anatomy Lecture

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS COURSE OBJECTIVES SPECIFIC LEARNING OUTCOMES	THEORY	TEACHING STRATEGIES
Enlist the common causative agents of Eye, Ear infections		Lecture
Discuss the pathogenesis and clinical features of common pathogens		
Correlate proto-oncogene and oncogene concept with relevance of tumors		
Discuss tumor markers and their significance		Lecture
Discuss the concept of xenobiotics		
Explain and interpret pedigree of multifactorial mitochondrial disorder i.e. Libers hereditary optic neuropathy		

DISEASE PREVENTION & IMPACT COURSE OBJECTIVES SPECIFIC LEARNING OUTCOMES	THEORY	TEACHING STRATEGIES
Explain the role of antioxidants (selenium (Se), Vit- E & C, Glutathione) in preventing oxidative stress		Biochemistry Lecture
Identify factors leading to noise pollution		Community Medicine Lecture
Describe the common causes of blindness in community		Community Medicine Lecture
Describe risk factors and preventive strategies for blindness at community level		Community Medicine Lecture
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.		Behavioral Sciences Lecture

ASSESSMENT TOOLS

MCQS

SEQS

OSPE

OSCE

VIVA

RESOURCE BOOKS

Anatomy

- Langman's Medical Embryology
- Snell's Clinical Anatomy
- Snell's Clinical Neuroanatomy. Walter Kluwer
- Laiq H.S. Medical Histology. Paramount Books.
- Laiq H.S. General Anatomy. Paramount Books.

Physiology

- Guyton AC and Hall JE. Textbook of Medical Physiology. W. B. Saunders & Co., Philadelphia.
- Essentials of Medical Physiology by Mushtaq Ahmad

Biochemistry

- Harper's Biochemistry by Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. McGraw-Hill latest ed.
- Lippincott's Illustrated Reviews Biochemistry Champe, P.C. & Harvey, E.A latest ed. Published by Lippincott Williams and Wilkins.
- 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, McGraw-Hill.
- Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins

Behavioral Sciences

- Handbook of Behavioural Sciences by Prof. Mowadat H. Rana, 3rd Edition.
- Medical and Psychosocial Aspects of Chronic Illness and Disability SIXTH EDITION Donna R. Falvo, PhD Beverley E. Holland, PhD, RN,

Community medicine

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

Surgery

- Bailey & Love' Short practice of Surgery

Medicine

- Davidson's Principles and Practice of Medicine

Islamiyat

- Standard Islamiyat (compulsory) for B.A, BSc, MA, MSc, MBBS by Prof. M. Sharif Islahi.
- Ilmi Islamiyat (compulsory) for BA, BSc, & equivalent.