INDEPENDENT MEDICAL COLLEGE, FSD

BLOCK-1

FOUNDATION – (MODULE – 1)
CURRICULUM 2K23
(Study Guide)

MODULAR INTEGRATED
UNDERGRADUATE CURRICULUM

TABLE OF CONTENTS

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

Tomorrow's doctor is required to acquire competencies, which could align his knowledge base and skill set for his professional practices. The foundation of knowledge needs to commence from 'The Cell'. The cell is a structural and functional unit of life and has a role in normal homeostasis ensuring appropriate cellular functions. Hence, this module has been designed to introduce a blend of molecular, genetic, anatomical, physiological, and psychosocial information essential for developing a perspective on the function of the human body in health and disease. Besides, an initial orientation to pharmacology and pathology subject has been provided so that students are able to use this information in the coming modules.

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
1ST YEAR MBBS 2025

TIME TABLE (1ST BLOCK - 1ST MODULE)
(FOUNDATION & ORIENTATION)

DAY	08:00 - 09:45	09:45 - 11:15	11:15 - 11:45	11:45 - 01:15	01:15 - 02:00	02:00 - 02:30
Mon	Anatomy	Physiology	**BREAK**	Biochemistry	Pharmacology	**Self Directed Learning (SDL)**
Tue	Anatomy	Physiology		Biochemistry	Holy Quran / Pak Study	
Wed	Anatomy	Physiology		Biochemistry	Community Medicine	
Thu	Anatomy	Physiology		Biochemistry	Community Medicine	
Fri	CFRC 8:00 - 09:00	Anatomy 09:00 - 10:00	Behavioral Sciences 10:00 - 11:00	Biochemistry Aging 11:00 - 12:00		
Sat	Anatomy 08:00 - 09:45	Physiology 09:45 - 11:15	**BREAK** 11:15 - 11:45	PERL 11:45 - 12:30	Pathology 12:30 - 02:00	SDL 02:00 - 02:30

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

1. Describe the microscopic features of nerve cells, muscle cells, general features of epithelia of the body.
2. Appraise the functional characteristics of various components of cell membrane and organelles of cell.
3. Differentiate between the dynamics of various transport mechanisms along the cell membrane.
4. Compare the functional differences between RBCs, WBCs and blood groups.
5. Explain the significance of homeostatic mechanisms in keeping body's internal environment nearly constant.
6. Appraise the formation and functions of autonomic nervous system.
7. Correlate the structural design of each organ to its function.
8. Acquire information about the different fascial planes in the different regions of the body & their surgical importance.
9. Use descriptive anatomical terms of position to describe the different body structures in relation to each other.
10. Describe the movements of body using proper anatomical terms of movement.
11. Describe and demonstrate the various bony landmarks.
12. Describe the types of joints and correlate them to the mechanisms of movement.
13. Classify the bone, joints and muscles based on the structure, function, phylogenetic origin.
14. Describe the structures associated with muscles and explain their functional correlations.
15. Classify and describe the cardiovascular system and correlate it functionally.
16. Amplify the anatomical basis for radiological, cross-sectional, and surface anatomy.
17. Correlate clinicopathologically the apoptosis in health & diseases.

LEARNING OBJECTS
BLOCK 1 – FOUNDATION MODULE -1

ANATOMY	
COURSE OBJECTIVES **Theory** **SPECIFIC LEARNING OUTCOMES** **GROSS ANATOMY**	**TEACHING STRATEGIES**
Briefly describe the applied branches of anatomy Describe the "Anatomical Position" Describe the anatomical planes of body. Describe the terms of relationship, commonly used in Anatomy. Describe the anatomical terms used specifically for Limbs. Describe the terms related to movements.	SGD
Describe, identify, and exemplify the general morphological features of bones. Describe the developmental classification of bones. Describe the regional classification of bones. Describe the structural classification of bones. Describe the morphological classification of bones. Describe and exemplify Sesamoid, Pneumatic, Wormian and Heterotopic bones. Describe the classification of bones on the basis of osteogenesis. Describe the relationship of growing end of bones with the direction of nutrient foramen Describe the blood supply, innervation and lymphatic drainage of various types of bones Describe the use of bone tissue for bone marrow biopsy and bone grafting Describe the salient features of common types of fractures	SGD
Describe the subtypes and gross features of Hyaline Cartilage Describe the gross features of Elastic Cartilage Describe the gross features of Fibrocartilage Differentiate the three types of cartilages	SGD
Describe and exemplify the structural classification of Joints (synovial, cartilaginous & fibrous) along with their sub-classification. Describe the components and characteristic features of a Synovial Joint Describe the blood supply, innervation and lymphatic drainage of Synovial Joints, cartilaginous joints, and fibrous joints. List the factors stabilizing a synovial joint. Describe the mechanism of movements	SGD
Describe the structure and function of Skin on the basis of its two layers; Epidermis and Dermis Describe the surface irregularities of the skin. Describe the structure of Hair as an appendage of skin.	SGD

Describe the structure of Nail as an appendage of skin. Describe the structure of Sweat and Sebaceous Glands Describe the structure and function of Superficial Fascia Describe the structure, function, and modifications of Deep Fascia Describe and classify the burns and anatomical basis of manifestations of integumentary system	
Define Muscle Classify and describe Muscle Tissue based on Structure, Function and Development Describe Somatic and Visceral Muscles Describe and differentiate the Red and White Variety of Skeletal Muscles Describe Type A, B and C of Skeletal Muscles Classify and describe the skeletal muscles based on architecture. Classify skeletal muscle based on action. Describe the parts of a skeletal muscle. Describe the methods of studying skeletal muscle activity. Describe and differentiate the basic organization of innervation to skeletal, smooth, and cardiac muscle. Describe the structure of Tendons. Describe the structure of Synovial Bursae Describe the structure of Raphe. Comprehend the meaning of Paralysis, Spasm, Atrophy, Hypertrophy, Hyperplasia and Regeneration in relation to muscle tissue. Define Myasthenia Gravis and Polymyositis Define Angina pectoris and Fibrillation of Cardiac Muscle	SGD
Classify the types of blood circulation. Classify and exemplify various types of blood vessels. Describe and exemplify various types of anastomoses. Explain the importance of End Arteries Define the terms: Arteriosclerosis, Atherosclerosis and Varicose Veins Describe the general organization of Lymphatic Circulation Define the terms: Lymphoid Tissue, Tissue Fluid, Lymphatic Capillaries, Lymph and Lymphatic Vessels Define the terms; Lymphangitis, Lymphadenitis, Lymphadenopathy and Lymphography	SGD
Define neuron. Describe the anatomical structure of a neuron. Classify neurons based on morphology with examples. Classify neurons based on function. Describe the components of the central nervous system. Describe the components of the peripheral nervous system. Name the supporting cells (neuroglia) of the central nervous system. Describe the structure and functions of the neuroglia of the central nervous system. Enumerate the supporting cells (neuroglia) of the peripheral nervous system.	SGD

Describe the structure and functions of the neuroglia of the peripheral nervous system. Describe the gross and/or microscopic anatomy of the following structures: Nerve, Nerve fiber, Ganglion, Tract, Fasciculus, Funiculus and Lemniscus Enlist the cranial nerves I to XII Describe the types of nerve fibers carried by and distribution of the cranial nerves. Describe the formation, types of modalities carried by, and distribution of the spinal nerves. Define and explain Dermatome (s) Define and explain Myotome (s) Describe the formation of Plexuses. Differentiate between Somatic and Visceral nervous system. Define Receptors Describe the functions of receptors. Classify sensory receptors based on modality (with location) Define Effectors Describe the functions of effectors. Describe ANS and differentiate between sympathetic and parasympathetic nervous system	
Identify displacement of fracture segments of the bone Identify dislocation of joints Describe the basic concept behind taking a biopsy of a tissue.	SGD
EMBRYOLOGY & POST-NATAL DEVELOPMENT	
Describe the cell cycle Enlist different stages of Mitosis and Meiosis Compare and contrast mitosis and Meiosis Enlist the numerical chromosomal anomalies Describe the anatomical basis for numerical chromosomal abnormalities Describe the clinical presentation of numerical chromosomal abnormalities and justify them Embryologically Describe the clinical presentation of structural chromosomal abnormalities and justify them Embryologically list the structural chromosomal anomalies Describe the anatomical basis for structural chromosomal abnormalities Describe the anatomical basis for the structural and numerical chromosomal anomalies Describe the embryological basis for mosaicism Describe the embryological basis for teratoma Describe the clinical presentation of common numerical chromosomal abnormalities	Interactive Lectures
Describe the Process of spermatogenesis and spermiogenesis Describe the embryological basis for Abnormal gametes Discuss the embryological basis of male infertility	Interactive Lectures
Describe the Prenatal and postnatal maturation of oocyte	Interactive Lectures

Describe the significance of arrested development of oocyte Describe the hormonal control of oocyte maturation Discuss the embryological basis of female infertility	Interactive Lectures
Compare and contrast oogenesis and spermatogenesis	Interactive Lectures
Enlist and briefly describe the female reproductive organs	Interactive Lectures
Describe the hormonal control of female reproductive cycles Enumerate and describe the steps of the ovarian cycle Describe the process of ovulation Describe the formation, function and fate of corpus luteum Describe the anatomical and physiological basis of the following: Mittelschmerz, Anovulation, Menopause Define menstrual cycle Describe the phases of menstrual cycle Describe the anatomical and physiological basis of an-ovulatory menstrual cycle	Interactive Lectures
Describe the transportation of male and female gametes Describe viability of gametes Explain the anatomical basis of diaspermy, triploidy	Interactive Lectures
Define fertilization Describe the phases of fertilization Draw and label a diagram illustrating the phases of fertilization Enumerate and describe the results of fertilization Describe the anatomical and physiological basis of sex determination of the embryo	Interactive Lectures
Define contraception Explain the mechanisms of following contraceptive techniques: 1. Barrier methods 2. Hormonal methods 3. Intrauterine device (IUD) 4. Emergency contraceptive pills (ECPs) 5. Male and female sterilization	Interactive Lectures
Describe the anatomical and physiological basis of male and female infertility Describe the role of clomiphine citrate in inducing ovulation Define assisted reproductive techniques Describe the mechanisms of following reproductive techniques: 1. In vitro fertilization (IVF) and embryo transfer 2. Cryopreservation of embryo 3. Intra-cytoplasmic sperm injection (ICSI) 4. Assisted in vivo fertilization 5. Surrogacy Explain the correlation of multiple births with assisted reproductive techniques	Interactive Lectures
Describe the process of cleavage of embryo and blastocyst formation Describe the differentiation of embryo blast into epiblast and hypoblast Describe the establishment of cranial-caudal embryonic axis	Interactive Lectures

Describe pre-implantation genetic diagnosis Describe the origin and uses of embryonic stem cells and the techniques of obtaining these cells from the embryo (reproductive cloning & therapeutic cloning) Explain the embryological basis of spontaneous abortion Describe the events and factors influencing the cleavage of zygote	
Describe the sequence of events pertaining to formation of blastocyst Compare and contrast the villi	Interactive Lectures
Describe the process of Compaction Describe the Formation of morula (division into inner and outer cell mass) Describe the anatomical basis for the preimplantation genetic diagnosis Describe the formation of amniotic cavity, embryonic disc, and umbilical vesicle Describe the formation of chorionic sac	Interactive Lectures
Describe the Uterus at the time of implantation (decidua reaction) Illustrate the concept of Implantation Describe the differentiation of inner and outer cell mass Describe the Abnormal implantation/ extra uterine implantations Enumerate the factors responsible for inhibition of implantation	Interactive Lectures
Describe the Molar pregnancy	Interactive Lectures
Describe the Establishment of utero-placental circulation	Interactive Lectures
Describe the embryological basis of abortions and its types	Interactive Lectures
Describe the Formation & fate of primitive streak Draw a concept map highlighting the sequence of events responsible for transformation of bilaminar germ disc into trilaminar germ disc Describe the embryology behind sacrococcygeal teratoma and justify its clinical picture Describe the molecular factors responsible for gastrulation	Interactive Lectures
Describe the Invagination and movement of prenotochordal cells Describe the Notochordal plate formation Describe the Neuroenteric canal formation Describe the fate of the notochord Describe the Establishment of body axis Draw and label the fate map establishment Describe the Fate map establishment Describe the molecular basis for notochord formation Describe the role of notochord as an inducer Describe the embryological basis for situs inversus	Interactive Lectures
Describe the Formation of neural tube from neural plate. Justify embryologically the clinical picture seen in various neural tube defects Describe the process of Migration of neural crest cells Enlist the Derivatives of neural tube and describe the fate of each Enlist the Derivatives of neural crest cells Enlist the ectodermal derivatives Describe the molecular and genetic factors for the process of neurulation	Interactive Lectures

Describe the Differentiation of mesoderm into its constituting components Describe the Somite formation and its fate Describe the Estimation of age by somites Describe the formation of intra-embryonic coelom	Interactive Lectures
Describe the processes of vasculogenesis & angiogenesis Explain the features of primordial cardiovascular system Describe the anatomical justification for Capillary hemangiomas	Interactive Lectures
Enlist the derivatives of germ layers	Interactive Lectures
Describe the formation and functions of chorionic villi	Interactive Lectures
Describe the Cephalo-caudal folding Describe the Lateral folding	Interactive Lectures
Enlist and Describe the Derivatives of intermediate and lateral plate mesoderm Enlist & Describe the Derivatives of endoderm	Interactive Lectures
Enlist & describe the derivatives of ectoderm Describe the factors influencing the embryonic development	Interactive Lectures
Enlist the characteristic features of the embryo during 4th – 8th weeks. Describe the criteria for estimating the developmental staging in human embryos Explain the estimation of gestational & embryonic age	Interactive Lectures
Explain the trimesters of Pregnancy. Explain the estimation of fetal age Explain the measurement and characteristics of fetus. Describe the Overview of the monthly changes in External appearance of fetus (9th-38th weeks) Describe Viability of fetuses and low birth weight babies Explain the factors influencing fetal growth Describe the clinical problems encountered by babies born with IUGR and post maturity	Interactive Lectures
Tabulate the criteria for estimating fertilization age during the fetal period Describe the post maturity syndrome Describe the procedures for assessing fetal status Describe the clinical picture of IUGR & factors resulting in IUGR	Interactive Lectures
Correlate the levels of alpha fetoprotein essay and fetal anomalies	Interactive Lectures
List the fetal membranes Describe the macroscopic & microscopic features of Decidua Enlist the various parts of decidua Functionally correlate the parts of the decidua with its structure Describe the Changes in the trophoblast leading to the development of placenta Describe the Structure (macroscopic & microscopic) of placenta Enlist & correlate the Functions of placenta with its structure Describe the Microscopic anatomy of Placental membrane Describe the Placental circulation (fetal & maternal) Embryologically justify the hemolytic disease of the neonate Describe the functions of placenta	Interactive Lectures

Describe Placenta as an allograft & as an invasive tumor-like structure Describe the placental anomalies and their clinical picture (placenta previa, placenta ecreta, placenta percreta, battledore placenta, membranous placenta, pre-eclampsia) Describe the role of placenta as an allograft Describe the stages of labor	
Describe the Formation & fate of Umbilical cord Describe the Cord abnormalities Justify embryologically the clinical features observed in Absence of umbilical artery Describe the formation and circulation of Amniotic fluid Enlist the components of amniotic fluid Describe the Procedure of diagnostic amniocentesis Explain the significance of amniotic fluid Describe the factors responsible for Polyhydramnios and oligohydramnios Describe the characteristic signs and symptoms of oligohydramnios and polyhydramnios and justify embryologically Explain the clinical picture of umbilical band syndrome and justify it embryologically Explain the formation and fate of umbilical vesicle (yolk sac) Explain the formation and fate of Allantois Describe the clinical picture of allantoic cyst & sinus and justify it Embryologically	Interactive Lectures
Describe the development of Dizygotic twins Describe the development of Monozygotic twins Describe the fetal membranes in twin pregnancy Describe the twin transfusion syndrome Explain the zygosity of the twins Describe the characteristics of various types of conjoined monozygotic twins	Interactive Lectures
Describe the Various methods of pre-natal diagnosis Describe the Fetal therapy	Interactive Lectures
Define morphogens, protein kinases, notch delta pathway, transcription factors, epigenetics Define stem cells and pluripotency Define the human disorders associated with genetic mutations	Interactive Lectures
Define teratology: classification and causes of birth defects Define genomic imprinting Describe birth defects caused by genetic factors: numerical and structural anomalies Define and enlist the teratogens Describe the role of following in causing teratogenicity in humans: Drugs Environmental agents Chemicals & heavy metals Infectious agents	Interactive Lectures

Radiation Hormones Maternal diseases Describe the basis for male-mediated teratogens	
MICROSCOPIC ANATOMY (HISTOLOGY AND PATHOLOGY)	
Describe different types of microscopies Describe Staining methods and their significance Describe the basis of enzyme histochemistry	Interactive Lectures
Describe the electron microscopic structure and fluid mosaic model of plasma membrane Draw the fluid mosaic model of plasma membrane Draw and label the structure and function of glycocalyx coat and lipid raft Describe the structure of glycocalyx coat and lipid raft and correlate it with function Describe different types of membrane proteins and their functions	Interactive Lectures
Explain different modes of transport across the cell membrane Describe the signal reception and transduction through different routes Tabulate the mechanisms of transport across the cell membrane Explain the following disorders related to cell membrane: Pseudohypoparathyroidism and Dwarfism	Interactive Lectures
List the membranous and non-membranous cellular organelles Draw and label the light and electron microscopic structure and functions of the cellular organelles Describe the structure of the following cellular organelles and correlate with their function: • Ribosomes • Endoplasmic reticulum (rough & smooth) • Golgi apparatus • Lysosomes • Proteasomes • Mitochondria • Peroxisomes Describe the clinical presentation of lysosomal storage diseases and correlate with their histological basis Describe the structural components of cytoskeleton, and correlate them with their functions Explain the histological basis of immotile cilia syndrome	Interactive Lectures
Describe the histological features of cytoplasmic inclusions	Interactive Lectures
Describe the structure of nuclear envelope and nuclear pores	Interactive Lectures
Describe the structure of chromatin Describe the structure of chromosome Draw and label the structure of nucleolus Describe the structure of nucleolus Describe the structure and types of DNA and RNA Describe the histological basis for apoptosis and necrosis	Interactive Lectures
Describe the clinical presentation of the following diseases and correlate	Interactive Lectures

with its histology. • Laminopathies • Malignancy	
Describe the correlation of cell cycle with the following diseases. • Retinoblastoma • Malignancy	Interactive Lectures
Describe the histological structure and function of basement membrane (light and electron) Describe the mechanism of ciliary movements	Interactive Lectures
Draw and label a diagram illustrating the electron microscopic structure of basement membrane Describe the basal surface modifications of epithelia Describe the electron microscopic structure and functions of intercellular junctions (lateral surface modifications) and give their locations Describe the Biochemical composition of the basolateral modifications Explain the correlation of intercellular junctions with the following diseases: 1. Gastric ulcer 2. Food poisoning 3. Pemphigus vulgaris	Interactive Lectures
Describe the electron microscopic structure of the following apical cell surface specializations: 1. Microvilli 2. Sterocilia 3. Cilia	Interactive Lectures
Explain the correlation between the structure of microvilli and celiac disease Classify and exemplify the epithelia with their histological structure, locations and functions	Interactive Lectures
Describe the structure of exocrine glands Explain the mechanism of transport across the epithelia Describe the classification of exocrine glands on the basis of: 1. Shape of secretory portions and ducts 2. Mode of secretion 3. Type of secretion	Interactive Lectures
Explain the histological basis of acne vulgaris	Interactive Lectures
Describe the composition and list the constituents of connective tissue Classify the connective tissue with examples Describe the composition of ground substance of connective tissue Describe the composition, distribution, and function of glycosaminoglycans in connective tissue Explain the role of GAGs in formation of barrier against bacteria and the role of hyaluronidase in the breakdown of this barrier Describe the structure, distribution, and functions of the cells of macrophage-mononuclear phagocytic system	Interactive Lectures
Describe the role of macrophages in innate immunity	Interactive Lectures

Describe the types of adipose tissue (white & brown), their histogenesis, locations and function	Interactive Lectures
Explain the etiology of Marfan's syndrome	Interactive Lectures
Describe lipid storage and mobilization in and from adipocytes and compare the brown and white adipose tissue	Interactive Lectures
Explain the histological basis and clinical presentation of the following diseases in relation to adipocytes: 1. Lipoma 2. Obesity (with special emphasis of the role of leptin)	Interactive Lectures
PRACTICAL - GENERAL ANATOMY	
Demonstrate the anatomical terms of position and movement, in particular on limbs. Demonstrate various anatomical movements of body Identify various elevations and anatomical landmarks on bones. Identify and interpret normal radiographs of various body regions Identify and interpret joint dislocations and displaced fracture bone segments radiographically.	Interactive Lectures
PRACTICAL - EMBRYOLOGY	
Calculate fertilization age, gestational age, embryonic/fetal age and expected date of delivery.	Interactive Lectures
On models, charts, aborted embryos and fetal specimens, identify the: • events of embryonic period, i.e., cleavage, morula and blastula formation, yolk sac, amniotic cavity, connecting stalk, gastrulation (notochord & primitive streak, three germ layers and their parts/derivatives), angiogenesis, neurulation, somites and embryonic age determination based on it, chorionic villi (primary, secondary & tertiary), developmental defects (sacrococcygeal teratoma, neural tube defects) • placenta and it's positional & implantational variations, umbilical cord and it's contents • fetal features during fetal period. Determine age of fetus based on these features.	Interactive Lectures
Describe the USG report for the: • fetal features, fetal age estimation, placental attachment with it's variations and fetal membranes. multiple pregnancies	Interactive Lectures
On gross examination of human placenta and umbilical cord, identify: • normal complete placenta and cord • placental structural variations • umbilical cord and anomalies of its attachment to placenta • contents of umbilical cord (umbilical vessels anomalies)	Interactive Lectures
Identify the features of haemolytic disease of newborn, dizygotic and monozygotic twins and correlate them embryologically	Interactive Lectures
Identify the protocols and procedural steps for amniocentesis and chorionic villus sampling (CVS) and correlate their significance in developmental defects. Correlate the role of alpha feto-protein assays in neural tube defects.	Interactive Lectures
PRACTICAL - HISTOLOGY	

Describe different types of staining techniques and their significance with special emphasis on H&E staining	Practical
Identify and draw different parts of light microscope	Practical
Identify and demonstrate different cell shapes under the microscope	Practical
Identify and demonstrate under light microscope the following types of epithelia: 1. Simple squamous 2. Simple cuboidal 3. Simple columnar (ciliated & non-ciliated) 4. Pseudostratified columnar (ciliated & non-ciliated) 5. Stratified squamous (keratinized & non keratinized) 6. Stratified cuboidal 7. Stratified columnar 8. Transitional	Practical
Identify and demonstrate serous & mucous secreting glands under light microscope	Practical
Identify and demonstrate the various types of connective tissue	Practical

PHYSIOLOGY		
LEC. NO	**LEARNING OBJECTIVES**	**TEACHING STRATEGIES**
1	Define Homeostasis	Interactive Lectures
2	Explain control system of body by giving examples	Interactive Lectures, SGD
3	Differentiate between Extracellular and Intracellular Fluids	Interactive Lectures, SGD
4	Explain the positive and negative feedback mechanisms with examples	Interactive Lectures, SGD
5	Explain the significance of feed forward/ adaptive control/delayed negative feedback mechanisms	Interactive Lectures, SGD, Tutorial
6	Explain the structure of cell membrane	Interactive Lectures
7	Enlist the types of cell membrane proteins	Interactive Lectures, SGD
8	Enumerate the functions of membrane proteins	Interactive Lectures, SGD
9	Define and enumerate the functions of cell Glycocalyx	Interactive Lectures, SGD
10	Enlist membranous and non-membranous organelles	Interactive Lectures, SGD
11	Enlist the self- replicative organelles	Interactive Lectures, Tutorial
12	Differentiate between the functions of smooth and rough endoplasmic reticulum	Interactive Lectures, SGD
13	Explain the functions of Golgiapparatus	Interactive Lectures, SGD
14	Enlist the enzymes of lysosomes	Interactive Lectures, SGD
15	Explain the functions of lysosomes	Interactive Lectures, SGD
16	Enlist the enzymes of peroxisomes	Interactive Lectures, SGD
17	Explain the functions of peroxisomes	Interactive Lectures, SGD
18	Enumerate the components and functions of cytoskeleton	Interactive Lectures, SGD
19	Define and enlist types of endocytosis	Interactive Lectures, SGD

20	Explain the mechanism of pinocytosis	Interactive Lectures, SGD
21	Classify different transport mechanisms	Interactive Lectures, SGD
22	Compare the composition of Na, K and Cl in extra cellular and intracellular fluid	Interactive Lectures, SGD
23	Define and enlist different types of diffusion Explain the process of facilitated diffusion with the aid of diagram	Interactive Lectures, SGD
24	Define and classify different types of active transport	Interactive Lectures, SGD
25	Describe primary and secondary active transport with examples	Interactive Lectures, SGD
26	Explain voltage and ligand gated channels with examples	Interactive Lectures, SGD
27	Name Na, K channel Blockers.	Interactive Lectures, SGD
28	Discuss functions and significance of Na/K ATPase pump	Interactive Lectures, SGD
29	Enumerate the functions of blood Explain the composition of blood Enumerate the plasma proteins	Interactive Lectures, SGD
30	Discuss functions of plasma proteins &describe the pathophysiology of edema	Interactive Lectures, SGD
31	Discuss the characteristics of red blood cells	Interactive Lectures, SGD
32	Explain different types of Bone marrows	Interactive Lectures, SGD
33	Enumerate the different sites of erythropoiesis at different ages	Interactive Lectures, SGD
34	Explain the stages of erythropoiesis	Interactive Lectures, SGD
35	Enumerate fact or sthatregulateery thropoiesis	Interactive Lectures, SGD
36	Discuss the site and role of erythropoietininred blood cell production	Interactive Lectures, SGD
37	Explain the significance of vitamin B12 and folic acid in maturation of red blood cell	Interactive Lectures, SGD
38	Enumerate the types of normal hemoglobin in different ages of life	Interactive Lectures, SGD
39	Explain the role of Iron in Hemoglobin formation.	Interactive Lectures, SGD
40	Define blood indices, give their normal values & enumerate the conditions in which these values are disturbed	Interactive Lectures, Tutorial
41	Enlist the abnormal types of hemoglobin	Interactive Lectures Tutorial
42	Enumerate the types of white blood cells	Interactive Lectures Tutorial
43	Describe the characteristics and functions of Neutrophils	Interactive Lectures Tutorial
44	Explain the process of defense against invading agent by Neutrophils	Interactive Lectures, SGD
45	Define leukocytosis and leukemia	Interactive Lectures, SGD
46	Explain the effects of leukemiaon body	Interactive Lectures, SGD
47	Define leucopenia	Interactive Lectures, SGD

48	Explain the process of defense against invading agent by macrophages	Interactive Lectures, SGD
49	Discuss different lines of defense during inflammation	Interactive Lectures, SGD
50	Explain the functions of Neutrophils and macrophages in spread of inflammation (walling off effect)	Interactive Lectures, SGD
51	Define the Reticuloendothelialsystem	Interactive Lectures, SGD
52	Enlist the different components of Reticuloendothelial system	Interactive Lectures, SGD
53	Explain the characteristics and functions of basophiles	Interactive Lectures, SGD
54	Explain the characteristics and functions of Eosinophils and enlist conditions in which these cells are raised.	Interactive Lectures, SGD
55	Enumerate different blood group types	Interactive Lectures, SGD
56	Explain the basis of ABO and Rh blood system	Interactive Lectures, SGD
57	Explain the Landsteiner law	Interactive Lectures, SGD
58	Discuss Components of Autonomic nervous system	Interactive Lectures, SGD
59	Explain the physiological anatomy of sympathetic and parasympathetic nervous system	Interactive Lectures, SGD
60	Describe the types of adrenergic and cholinergic receptors and their functions	Interactive Lectures, SGD
61	Explain the effects of sympathetic and parasympathetic on various organs / system of body	Interactive Lectures, SGD

	PHYSIOLOGY PRACTICAL	**Total Hours = 10**	
	SPECIFICLEARNINGOBJECTIVES	**DISCIPLINE**	**TOPIC**
1	Explainlaboratory/clinicalproceduretothesubject. Obtain verbal consent from subject before starting a procedure. Reassure the subject after the procedure.	Medical Physiology	Consent

BIOCHEMISTRY		
LEC. NO	**LEARNING OBJECTIVES**	**TEACHING STRATEGIES**
1	Differentiate between different types of cells.	Interactive Lectures
2	Explain the concept of organization of cells to tissue, tissues to organ, organs to system.	Interactive Lectures, SGD
3	Differentiate between the eukaryotic and prokaryotic cells	Interactive Lectures, SGD
4	Describe the composition and structure of cell on biochemical basis and justify it as fluid mosaic model.	Interactive Lectures, SGD
5	Describe the structure and function of cell membrane with particular reference to the role of (i) Lipids (ii) Carbohydrates (iii) Proteins	Interactive Lectures, SGD
6	Explain why the cell membrane is called fluid mosaic model	Interactive Lectures,
7	Discuss the various ways of cell-to-cell communication	Interactive Lectures, SGD

	and to the environment.	
8	Describe cell to cell communications. Cell signaling pathways (only G protein signaling)	Interactive Lectures, SGD
9	Describe cell to cell adhesion.	Interactive Lectures, SGD
10	Explain the biochemical markers and importance of subcellular organelles and their inherited disorders especially: a. I- cell disease b. Refsum disease c. Parkinsonism d. Progeria	Interactive Lectures, SGD
11	Describe the chemistry of purines and pyrimidines and their linkage in nucleic acid synthesis and their metabolism	Interactive Lectures, Tutorial
12	Discuss the organization of DNA with special reference to Watson and crick model, composition, structure, role of proteins, Chargaff's rule of base pairing and genetic coding	Interactive Lectures, SGD
13	Describe the structural forms of DNA	Interactive Lectures, SGD
14	Discuss the structure of different types of RNAs with special reference to composition, linkage, functions hn RNA, micro RNA	Interactive Lectures, SGD
15	Illustrate the structure and functions of various types of RNAs	Interactive Lectures, SGD
16	Describe the functions of various small RNAs present in cell	Interactive Lectures, SGD
17	Explain the structure and nomenclature of nucleotides, biomedical importance of natural and synthetic analogues	Interactive Lectures, SGD
18	Interpret the role of synthetic analogues of nucleotides in medicine based on sign/symptoms and data e.g Methotrexate, 5 Flurouracil and Allupurinol.	Interactive Lectures, SGD
19	Explain the higher organization of DNA. Difference between DNA, chromatid and chromosome	Interactive Lectures, SGD
20	Illustrate de Novo and salvage pathways of purines and pyrimidines	Interactive Lectures, SGD
21	Describe the degradation of purine and pyramidine nucleotides	Interactive Lectures, SGD
22	Interpret Lesch-Nyhan syndrome, gout and adenosine deaminase deficiency on given data	Interactive Lectures, SGD
23	Describe in detail all the steps in prokaryotic DNA replication with emphasis on: Different proteins required, Primers, DNA polymerase; their different components and functions, Initiation, elongation and	Interactive Lectures, SGD
24	Describe in detail all the steps in Eukaryotic DNA replication with emphasis on differences between Pro-	Interactive Lectures, SGD
25	Describe DNA repair especially Xerodermapigmentosa	Interactive Lectures, SGD

26	Explain the transcription in prokaryotes focusing on the following key points; RNA polymerase, its components and functions, Initiation, elongation, and termination of	Interactive Lectures, SGD
27	Illustrate the transcription in eukaryotes focusing on the differences between pro- and eukaryotic transcription and post transcriptional modifications Wobble hypothesis	Interactive Lectures, SGD
28	Interpret the translation focusing on the following key points: Initiation, elongation and termination and inhibition by drugs	Interactive Lectures, SGD
29	Describe Post-translational modification of proteins	Interactive Lectures, SGD

	BIOCHEMISTRYPRACTICAL	**Total Hours = 10**	
	SPECIFICLEARNINGOBJECTIVES	**DISCIPLINE**	**TOPIC**
1	Demonstratethesteptakentopreventorrectify TheLaboratoryHazards	Biochemistry	LabHazards
2	Identifythestructureofcellsundermicroscope		Cell
3	Identify the methods of isolation of cell organelles'		Cell organelles
4	Identify the different parts of equipment . e., centrifuge, Micro lab, Electrophoresis		Equipment
5	Demonstrate the basic principles, uses and workingof centrifuge,chromatography, Electrophoresis &spectrophotometer		Demonstration of techniques

PATHOLOGY	
THEORY	
LEARNING OBJECTIVES	**TEACHING STRATEGIES**
Discuss the significance of pathology. Discuss the causes of cell injury. Identify the types of cell injury. Describe the mechanism of cell injury Identify the types of cell death. Define necrosis and apoptosis. Describe different types of necrosis. Compare apoptosis with necrosis. Identify different types and mechanism of cellular adaptations to stress Discuss the mechanism and types of intracellular accumulations and pathological calcifications	Lectures
Enumerate the microbes causing infectious diseases.	Lectures

Describe the structure of bacterial cell Differentiate cell walls of gram positive and gram-negative bacteria. Compare the structure of bacterial cell and virus Discuss the growth curve of bacteria. Enlist steps of viral replication Identify types of bacterial infections Enlist stages of bacterial pathogenesis	
Discuss the determinants of bacterial pathogenesis	Lectures
Define sterilization and disinfection. Describe the principles of sterilization and disinfection. Describe clinical uses of common disinfectants and their mode of sterilization Discuss physical and chemical agents of sterilization	Lectures

PHARMACOLOGY AND THERAPEUTICS	
THEORY	
LEARNING OBJECTIVES	**TEACHING STRATEGIES**
Definitions of Pharmacology, drug, pro-drug, placebo, active principles, sources of drugs; Brief outline of Absorption, Distribution, Metabolism and Excretion	Lectures
Definitions of receptor, agonist, partial agonist, inverse agonist, antagonist and types of receptors and second messengers; Diagrammatic concept of signaling mechanisms	Lectures
Pharmacological aspects of Autonomic Receptors (types of autonomic receptors, important sites and actions)	Lectures

COMMUNITY MEDICINE & PUBLIC HEALTH	
THEORY	
LEARNING OBJECTIVES	**TEACHING STRATEGIES**
Describe the changing concepts and new philosophy of health Explain responsibility for health	Lectures
Explain dimensions and determinants of health and their role in achieving positive health Discuss concept of health and wellbeing Describe the Physical quality of Life Index & Human Development Index	Lectures
Describe the importance of health indicators Classify health indicators Calculate Morbidity and Mortality Describe Disability indicators Compare indicators among countries	Lectures
Conceptualize disease causation and natural history of disease Explain Germ theory & multifactorial causation Describe Epidemiological Triad Discuss Web of disease causation	Lectures

Describe Gradient of infection	
Describe principles of prevention and control on prevalent diseases Explain difference between elimination and eradication Describe disease surveillance, types and cycle Explain Primary, secondary, & tertiary prevention Describe five levels of interventions	Lectures

AGING	
THEORY	
LEARNING OBJECTIVES	**TEACHING STRATEGIES**
Discuss telomeres and telomerase and their clinical significance in aging.	Lectures

IMPACT (EPIDEMIOLOGY, SOCIOLOGY/SOCIETY, COMMUNITY MEDICINE & PUBLIC HEALTH)	
THEORY	
LEARNING OBJECTIVES	**TEACHING STRATEGIES**
Identify the Biological Basis of human behavior and discuss social behavior Describe processes such as neurobiology of memory, emotions, sleep, learning, motivation, sex, arousal, reward and punishment	Lectures
Identify the burden of mental illness on the person, family and society Describe Intellectual disability, Mental Disorders and Personality Disorders	Lectures
Identify the role of psychosocial factors in various illnesses Describe psychosocial aspects of various system diseases such as CVS, CNS, GIT, Respiration, renal, endocrine and Cancer	Lectures
Identify the behavioral factors associated with pharmacological treatment of diseases Discuss Health belief model, treatment compliance and its psychosocial factors, social factors in drugs prescription and drug resistance	Lectures
Identify the rehabilitation work for patients on dialysis and any kind of physical disability Discuss the care requirements in chronic debilitating conditions like Diabetes, Multi- infarcts Dementia, chronic renal disease, limb amputation	Lectures
Identify the various physiological effects of stress Explain ANS response to stress, Describe behavioural manifestations of stress Stress related multiple sclerosis and autoimmune diseases	Lectures

ASSESSMENT
INTERNAL ASSESSMENT

BLOCK - 1
1ST YEAR MBBS
(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 1st BLOCK EXAMINATION		
SUBJECT	**WRITTEN**	
Following is the schedule of 1st Module Test		
Anatomy	(15-May-2025)	
Physiology	(16-May-2025)	
Biochemistry	(17-May-2025)	
Following is the schedule of 1st Block Examination.		
WRITTEN	**OSPE**	**VIVA**
14-June-2025	16-June-2025	Anatomy 17-June-2025 Physiology 18-June-2025 Biochemistry 19-June-2025

ASSESSMENT TOOLS

MCQS

SEQS

OSPE

OSCE

VIVA

MARKS DISTRIBUTION

MBBS 1ST PROFESSIONAL
BLOCK – 1

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (08 marks each) Observed	OSCE (05 marks each) Observed	OSVE 14 marks each Observed)	Marks
Normal Structure	Anatomy applied/clinical	20	04	40	04	-	01	46
Normal Function	Physiology applied/clinical	22	03	37	03	-	01	38
	Biochemistry applied/clinical	24	02	34	02	-	01	30
Disease Burden & Prevention	Community Medicine & Public Health	06	-	06	-	-	-	-
	Behavioral Sciences	05	-	05	-	-	-	-
Pathophysiology and Pharmacotherapeutics	Pathology	08	01	13	01	-	-	08
	Pharmacology	05	-	05	01	-	-	08
CFRC	CF -1	-	-	-	-	01	-	05
PERLs	PERLs -1	-	-	-	-	01	-	05
Total		**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-1

HEMATOPOIETIC & LYMPHATIC – (MODULE – 2)
CURRICULUM 2K23
(Study Guide)

MODULAR INTEGRATED
UNDERGRADUATE CURRICULUM

INTRODUCTION TO THE MODULE

"Blood is Life". Unlike any other organ, components of blood and immunity reflect/reveal disease processes in other organs as well. Therefore, studying blood is like opening a book to all aspects of medicine. Hence, this module has been designed to enable students to have a basic understanding about the normal structure, function and biochemistry of blood, immune and Lymphatic systems. Not only that, but students would also learn, when normal physiology and composition of blood and immune system is disturbed, what disorders result in our community. Emphasis has been given to incorporate deranged laboratory findings into the clinical problem solving.

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
1ST YEAR MBBS 2024

TIME TABLE (1ST BLOCK – 2ND MODULE)
(HEMATOPOIETIC & LYMPHATIC)

DAY	08:00 - 09:45	09:45 - 11:15	11:15 - 11:45	11:45 - 01:15	01:15 - 02:00	02:00 - 02:30
Mon	Anatomy	Physiology	**BREAK**	Biochemistry	Community Medicine	**Self Directed Learning (SDL)**
Tue	Anatomy	Physiology		Biochemistry	Holy Quran / IS / PS	
Wed	Anatomy	Physiology		Biochemistry	Pathology	
Thu	Biochemistry	Physiology		Biochemistry	Pharmacology	
Fri	CFRC 8:00 - 09:00	Biochemistry 09:00 - 10:15	Behavioral Sciences 10:15 - 11:00	Physiology 11:00 - 12:30		
Sat	Biochemistry 08:00 - 09:45	Physiology 09:45 - 11:15	**BREAK**	PERL 11:45 - 01:00	Pharmacology 01:00 - 02:00	SDL 02:00 - 02:30

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

1. Explain the function of all the organs / structures involved in this system and the mechanisms controlling them. (Spleen, lymph nodes, thymus, bone marrow, RBC's, WBCs, and platelets
2. Explain the etiology and pathogenesis of common blood & lymphatic diseases, particularly those of importance in Pakistan.
3. Explain the rationale for the use of common therapeutic agents for the diseases related to Blood and immunity.
4. Describe the role of immunity in the body
5. Discuss the working & uses of laboratory instruments in diagnostic lab visit
6. Relate red cell indices with health and disease
7. Recognize ABO/RH blood grouping system
8. Describe the role of Reticuloendothelial system in the body
9. Describe the events of hemostasis
10. Extrapolate the biochemical aspects of plasma proteins
11. Discuss the pharmacological treatment of iron deficiency anemia
12. Discuss Blood composition and function
13. Discuss the role of liver in hemolytic anemia
14. Practice history taking of a patient presented with blood disorders

LEARNING OBJECTS
BLOCK 1 – HEMATOPOIETIC & LYMPHATIC – 2 MODULE

ANATOMY	
COURSE OBJECTIVES	**TEACHING STRATEGIES**
GROSS ANATOMY	
Identify and describe the components of the Hematopoietic & Lymphoid Tissue and their function	Lectures / SGD
Location, coverings, relations of Spleen	Lectures / SGD
Origin, course branches and distribution of Splenic artery	Lectures / SGD
Venous drainage of Spleen, Portal vein formation, tributaries, and area of drainage.	Lectures / SGD
Location and relations of Thymus. Age related changes in Thymus	Lectures / SGD
EMBRYOLOGY & POST-NATAL DEVELOPMENT	
Intrauterine Development of spleen	Lectures
PRACTICAL - HISTOLOGY	
Light microscopic structure of Spleen, Thymus, Lymph nodes, tonsils and MALT including Appendix.	Practical

PHYSIOLOGY		
LEC. NO	**COURSE OBJECTIVES**	**TEACHING STRATEGIES**
1	Define anemia	Interactive Lectures
2	Classify anemia on the basis of morphology and cause	Interactive Lectures, SGD
3	Discuss the effects of anemia on the body	Interactive Lectures, SGD
4	Define Polycythemia	Interactive Lectures, SGD
5	Explain types of Polycythemia	Interactive Lectures, SGD, Tutorial
6	Discuss the effects of Polycythemia on the body	Interactive Lectures, SGD
7	Define hemostasis	Interactive Lectures, SGD
8	Describe the mechanisms by which hemostasis is secured	Interactive Lectures, SGD
9	Discuss the characteristics and functions of platelets	Interactive Lectures, SGD
10	Explain the mechanism of formation of platelet plug	Interactive Lectures, SGD
11	Enlist the clotting factor sin blood	Interactive Lectures, Tutorial
12	Explain the conversion of Prothromb into Thrombin & formation of Fibrin Fibers	Interactive Lectures, SGD
13	Explain the Intrinsic & extrinsic clotting pathway.	Interactive Lectures, SGD
14	Name & explain the mechanism of anticoagulants used in laboratory	Interactive Lectures, SGD
15	Explain the factors that prevent intravascular coagulation	Interactive Lectures, SGD

16	Explain the role of Calcium ions in Intrinsic and Extrinsic pathways	Interactive Lectures, SGD
17	Enlist the vitamin K dependent clotting factors	Interactive Lectures, SGD
18	Explain the prothrombintime, INR, and its clinical Significance	Interactive Lectures, SGD
19	Enlist and explain the conditions that cause Excessive bleeding	Interactive Lectures, SGD
20	Define thrombocytopenia	Interactive Lectures, SGD
21	Enlist the causes and consequences of Thrombocytopenia	Interactive Lectures, SGD
22	Define immunity	Interactive Lectures, SGD
23	Classify immunity	Interactive Lectures, SGD
24	Explain humoral immunity	Interactive Lectures, SGD
25	Explain Innate immunity.	Interactive Lectures, SGD
26	Elaborate cell mediated immunity.	Interactive Lectures, SGD
27	Describe the structure of antigen and immunoglobulin	Interactive Lectures, SGD
28	Describe the role of Helper T-cells in cell mediated immunity	Interactive Lectures, SGD
29	Enlist the types of Immunoglobulin's along with their functions	Interactive Lectures, SGD
30	Explain the role of memory cells in enhancing Antibody response (secondary response)	Interactive Lectures, SGD
31	Describe the mechanism of action of antibodies	Interactive Lectures, SGD
32	Elaborate the complement system.	Interactive Lectures, SGD
33	Elaborate Immune tolerance	Interactive Lectures, SGD
34	Explain the process of clone selection during T cell processing	Interactive Lectures, SGD
35	Discuss the failure of tolerance mechanism	Interactive Lectures, SGD
36	Discuss immunization.	Interactive Lectures, SGD
37	Define passive Immunity	Interactive Lectures, SGD
38	Explain features and physiological basis of delayed Reaction allergy	Interactive Lectures, SGD
39	Explain features and physiological basis of Atopic Allergy	Interactive Lectures, SGD
40	Explain features and physiological basis of Anaphylaxis, urticaria and Hay fever	Interactive Lectures, Tutorial
41	Discuss the pathophysiology, features and treatment of ABO and RH incompatibility	Interactive Lectures, Tutorial
42	Discuss the features and complications of Mismatched blood transfusion reaction	Interactive Lectures, Tutorial
43	Elaborate the Transplantation of Tissues and Organs	Interactive Lectures, Tutorial

44	Explain the process of tissue typing	Interactive Lectures, SGD	
45	Explain prevention of Graft Rejection by suppressing immune system	Interactive Lectures, SGD	
	PRACTICAL	**Total Hours = 6+6 = 12**	
	SPECIFICLEARNINGOBJECTIVES	**DISCIPLINE**	**TOPIC**
1	Interpret the Red Blood Cell Count, Hemoglobin concentration, Hematocrit and RBC Indices by Automated Cell Counter	Medical Physiology	Blood Cells
2	Interpret the Total Leucocyte Count, Differential Leucocyte Count Platelet Count by Automated Cell Counter.		
3 4	Determine Bleeding Time. Determine Clotting Time.		Bleeding/ Clotting time

BIOCHEMISTRY		
LEC. NO	**COURSE OBJECTIVES**	**TEACHING STRATEGIES**
1	Discuss the biochemical role and types of hemoglobin a) Differentiate Hemoglobin and myoglobin b) Explain oxygen dissociation curve of hemoglobin and myoglobin and factors regulating them c) Interpret CO toxicity on basis of sign and symptoms d) Explain the role of 2,3 BPG in fetal circulation	Interactive Lectures
2	Discuss haemoglobinopathies and their biochemical and genetic basis with special emphasis on sickle cell anemia, Thalassemia and methemoglobinemia a) Discuss the following types of anemia on the basis of signs and symptoms and laboratory data: a) Hypochromicmicrocytic b) Normochromicmicrocytic c) Normochromicnormocytic d) Macrocytic (megaloblastic)	Interactive Lectures, SGD
3	Explain their iron metabolism with mechanism of absorption and factors affecting it. a) Interpret Iron deficiency anemia on basis of given data and microscopic findings b) Inter prêt folic acid and cobalamin in relation to anemias on given data and microscopic findings c) Discuss biochemical role of pyridoxine and vitamin C in microcytic anemia	Interactive Lectures, SGD
4	Discuss the degradation of heme in macrophages of	Interactive Lectures, SGD

	reticuloendothelial system a) Describe the formation of bile pigments, their types and transport b) Discuss the fate of bilirubin	
5	Discuss hyperbilirubinemias and their biochemical basis a) Differentiate types of jaundice on basis of sign/symptoms and data b) Evaluate the genetic basis of jaundice on the basis of lab investigations	Interactive Lectures, SGD, Tutorial
6	Classify and Explain the biomedical importance of each class of plasma proteins	Interactive Lectures, SGD
7	Explain the structure and biochemical role of immunoglobulin b) Describe the production, structure and functions of Bcells, plasma cells, and antibodies (IgA, IgD, IgE, IgG, and IgM). c) Discuss the functions of the cytokines (ILs, TNFs, IFs, PDGF, and PAF). d) Interpret multiple myeloma on basis of given data	Interactive Lectures, SGD
8	Explain and interpret pedigree of single gene defect i.e. sickle cell anemia (Autosomal recessive) and Beta Thalassemia (x linked recessive)	Interactive Lectures, SGD

CODE	PRACTICAL	Total Hours= 6+6=12	
	SPECIFICLEARNINGOBJECTIVES	DISCIPLINE	TOPIC
1	Interpret jaundice on the basis of estimation of bilirubin	Medical Biochemistry	Jaundice & Anemias/ RBCs/ Homeostasis
2	Perform estimation of ALT and interpret the findings		
3	Perform estimation of AST and interpret the findings		
4	Perform estimation of ALP and interpret the findings		
5	Interpret graph based on oxy HB curve and 23 BPG Interpret different types of anemias & porphyriason Basis of s/s and data		

PATHOPHYSIOLOGYAND PHARMACOTHERAPEUTICS	
COURSE OBJECTIVES	TEACHING STRATEGIES
Describe the oral and parenteral iron preparations including their pharmacokinetics, uses, adverse effects	Lectures
Vitamin B12 preparations, Iron Antidotes	Lectures
Should know the terms: Hematopoietic growth factors, their name, mechanism of actions , uses and adverse effects	Lectures

Define and classify anemias according to underlying mechanism and MCV/MCH	Lectures
Discuss the causes and investigations of iron deficiency anemia and megaloblastic anemia	Lectures
Classify the benign and malignant disorders of WBCs	Lectures
Discuss the causes leading to reactive leukocytosis	Lectures
Interpretation of anemias on the basis of peripheral blood smear and bone marrow findings	Lectures
Classify bleeding disorders	Lectures
Discuss first line laboratory investigations for bleeding disorders	Lectures
Describe the basic concept of blood grouping and acute hemolytic transfusion reaction	Lectures

DISEASE PREVENTION AND IMPACT	
COURSE OBJECTIVES	**TEACHING STRATEGIES**
Describe the nutritional aspects of iron deficiency anemia and psychological aspects of diseases	Lectures
Enlist most common blood borne diseases in Pakistan Describe the routes of spread of blood borne diseases	Lectures
Genetic counseling of parents	Lectures
Psychological Counselling of patients and their families	Lectures
Identify and deal with the various psychosocial aspects of Hematopoietic System disorders (such as Sickle Cell Disease, Hemophilia, and Conditions of the Blood) on Individual, Family and Society.	Lectures

AGING	
THEORY	
COURSE OBJECTIVES	**TEACHING STRATEGIES**
Discuss the role of platelets in PRP treatment in old age (for skin, hairs and joints)	Lectures
Explain the role of glutathione in skin whitening	Lectures

ASSESSMENT

INTERNAL ASSESSMENT

BLOCK - 1

1ST YEAR MBBS

(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

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. Sunders & 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.