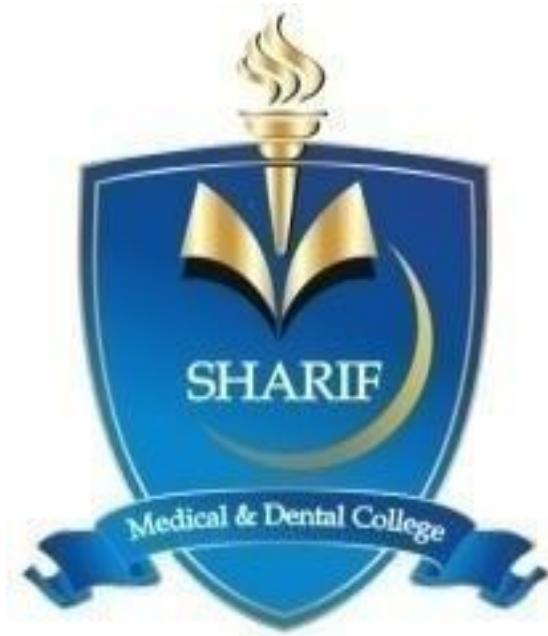


Department of Anatomy



Study Guide For

1st Year MBBS

Sharif Medical & Dental College,

Lahore



REFACE

Study guides are aimed at helping students fully comprehend their curriculum and its objectives. While textbooks are widely regarded as the most important learning resource, they require augmentation by facilitation and practical guidance. With a well-designed study guide, a student would have acquaintance with the goals of learning the curriculum and assessment modalities. In short, the student shall have insight into the entire timeline of the academic year.

As advised by UHS, the annual academic schedule is followed at SMDC. The students of MBBS are taught anatomy for the first two years of their degree course, while BDS students study anatomy during their first year. For MBBS students, Gross Anatomy, General Anatomy, Histology, and Embryology are covered in two years, with the regions divided between them. The Anatomy Department has created a course plan that fits our institution's vision and the UHS guidelines. This study guide includes a comprehensive list of the sections taught in our department, the time allocated for each of them, and the teaching techniques employed such as small group discussions, lectures, practicals and demonstrations on bones, dissected specimens, and models. Schedule of the assessments planned for the entire year has also been highlighted along with the marks distribution for the professional examinations. A list of reference books and reading material is also included at the end of the guide. We hope that this guide helps provide the students with valuable guidance.

Prof. Dr. Nausheen Raza

MBBS, M. Phil

Professor & HOD of Anatomy Department

SMDC, Lahore

Date: 26-02-2021



Vision & Mission of UHS

Qualitative and Quantitative Revolution in Medical Education and Research through Evolution and thereby improve Health Care delivery to Populace.

UHS shall be innovative global center of excellence in learning and research, supporting a community of scholars and professionals committed to serving society, promoting the development of students to reach their true potential in becoming competent, ethical, caring, and inquiring health professionals for the benefit of the country and the wider world.

Mission of SMDC

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

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

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

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

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

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

Vision of SMDC

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



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PLANNED TEACHING ACTIVITIES FOR 1ST YEAR MBBS DEPARTMENT OF ANATOMY

In the MBBS course program, PMC has assigned 250 hours to the subject of Anatomy. To help students make the most of their day, these hours are distributed among numerous modes of information transfer. These MITs are intended to assist students to correlate normal anatomical structures to their clinical importance macroscopically, microscopically, and developmentally, since the study of anatomy sections of gross anatomy, histology, general anatomy, and embryology.

Lectures

The total number of hours allotted for lectures has been divided across the GA, embryology, and histology sections, totaling 60 hours. The Professor, Associate Professors, and Assistant Professors will deliver these lectures. The students are directed to take notes during the lectures and are encouraged to participate actively. The lecturer will list the objectives of the lecture at the start so that the students can know how to focus study from the recommended books.

Practical classes

The 1st year MBBS class of 100 students is divided into 4 batches of 25 students each. Each batch has one practical class every week, focused on histology. The class is 2 hours long and the students are taught one component of normal human histology each week. The class is conducted by a demonstrator under the supervision of a senior instructor. The students are given an introduction about the tissue under study and are then instructed to observe the slides under a microscope. The attendance of the day is marked after a student correctly draws the slide on his/her practical notebook and gets it checked by the instructor.

Small-Group Discussions (SGDs)

SGDs are scheduled four times a week and consist of various activities such as dissection, demonstrations of dissected specimens and models, presentations, assignments, and classes of gross anatomy. These are conducted in 3 batches and each is assigned a demonstrator. All 3 batches are supervised by an assistant professor or associate professor. The students are directed to dissect cadavers and observe the dissected specimens to grasp the knowledge of the normal gross anatomy structures, bones, and radiology.

Self-directed learning

In the self-directed learning time, scheduled twice a week, the students are divided into 2 batches and allocated a classroom or library where they can catch up on assignments and ask for their teacher's assistance if required. This encourages group study practices as well.



TRAINING PROGRAM FOR DEPARTMENT OF ANATOMY 1ST YEAR

MBBS CLASS

General Anatomy

Starting this undergraduate degree program, a medical student is thrust into a world of complex terminologies and concepts; general anatomy is taught from the beginning of the session to familiarize them with basic medical terms.

Schedule of General Anatomy Lectures 1st year MBBS Class (Session 2020-21)

Sr. No	Topic Lecture
1.	Brief History, Different Disciplines of Anatomy, Descriptive terms
2.	Body Organization, Skin
3.	Appendages of Skin
4.	Cartilage
5.	Cartilage
6.	Muscles – I
7.	Muscle – II
8.	Tendon, Bursae, Aponeurosis, Fascia, Ligaments
9.	Bones I - Classification
10.	Bones II – Parts of Bones & General Features
11.	Bones III - Blood Supply + Clinical Correlates
12.	Joint – I
13.	Joint – II
14.	Joint – III
15.	Nervous System – I
16.	Nervous System – II
17.	Autonomic Nervous System
18.	Cardio Vascular System – I
19.	Cardio Vascular System – II
20.	Lymphatic System
21.	Test

Facilitator:

Dr. Nadia Ahmad



Schedule of General Embryology Lectures MBBS 1st Year Class (Session 2020-2021)

Sr. No	Topic Lecture
1.	Cell Division – Mitosis, Meiosis
2.	Female Reproductive Cycle
3.	Embryological Terms + Gametogenesis
4.	Gametogenesis
5.	Fertilization
6.	Cleavage, Blastocyst + Implantation
7.	Bilaminar Germ Disc
8.	Gastrulation
9.	Allantois, Notocord
10.	Neurulation
11.	Somites
12.	Intraembryonic Coelom
13.	Chorionic Villi, Folding of Embryo
14.	Derivatives of 3 Germ Layers, Estimation of Fetal Age
15.	Placenta I
16.	Placenta II
17.	Placental Malformations
18.	Placental Circulation
19.	Fetal Membranes
20.	Multiple Pregnancies
21.	Perinatology
22.	Teratogenesis & Genetic Abnormalities
23.	Test

Facilitator:

Prof. Dr. Nausheen Raza

Dr. Nadia Ahmad



Schedule of Special Embryology Lectures MBBS 1st Year (Session 2020-21)

Sr. No	Topic Lecture
1.	Special Embryology
2.	Skeletal System
3.	Skeletal System
4.	Muscular System
5.	Muscular System
6.	Integumentary System
7.	Integumentary System
8.	Test – II

Facilitator:

Dr. Waqas Iqbal Butt

Schedule of Histology Lectures MBBS 1st Year (Session 2020-2021)

Sr. No	Lecture Topics
1.	Introduction, Cell
2.	Cell organelles
3.	Cell organelles
4.	Nucleus
5.	Epithelium-I
6.	Epithelium-II
7.	Glands
8.	Connective Tissue Proper –I
9.	Connective Tissue Proper –II
10.	Cartilage
11.	Bone
12.	Muscle-I
13.	Muscle-II
14.	Nervous Tissue-I
15.	Nervous Tissue-II
16.	Nervous Tissue-III



17.	Circulatory system
18.	Circulatory system
19.	Lymphatics-I
20.	Lymphatics-II
21.	Lymphatics-III
22.	Respiratory system-I
23.	Respiratory system-II
24.	Integumentary system-I
25.	Integumentary system-II
26.	Test I: (Cell & Epithelium, Gland)
27.	Test II: (Nervous System, Connective Tissue Cartilage, Bone, Muscle)
28.	Test III: (Skin, Mammary Gland, Circulatory & Lymphatic Systems & Respiratory Systems)

Facilitators:

Prof. Tasneem A. Raza

Dr. Ammara Ghafoor

Gross Anatomy

Upper Limb (Teaching Schedule 2021)

Sr. No	Topic
1.	Terms of positions, Fascia
2.	Vessels, Nerves
3.	Muscle, Bursae
4.	Bones, Cartilage and Joints
5.	Typical Spinal nerve & Autonomic Nervous system
6.	Clavicle
7.	Scapula
8.	Pectoral region.
9.	Breast, Axillary Lymph Nodes
10.	Anatomy Lecture: Axilla: boundaries and contents
11.	Sternoclavicular Joint
12.	Brachial Plexuses and its Clinical correlates



13.	1st Substage
14.	Humerus
15.	Muscles of Back, Anastomosis around Scapula.
16.	Muscles attaching humerus to scapula, Musculocutaneous Nerve.
17.	Cutaneous nerve supply of Arm, Axillary nerve
18.	Acromioclavicular Joint Shoulder joint
19.	Muscles of arm, Radial nerve.
20.	Anatomy Lecture: Cubital fossa, Brachial artery.
21.	Shoulder Girdle, Shoulder Girdle Movements
22.	2nd Substage
23.	Radius
24.	Ulna
25.	Elbow Joint
26.	Anastomosis around elbow joint
27.	Superficial and deep flexor muscles
28.	Flexor retinaculum, flexor synovial sheaths
29.	Anastomosis around elbow
30.	Ulnar and median nerve in Forearm
31.	Radial and Ulnar Artery, Arterial Palmar Arches
32.	Carpal tunnel syndrome, Palmar Aponeurosis
33.	Palmar Spaces , Digital Pulp Spaces, Clinical Correlate
34.	3rdSubstage
35.	Anatomy Lecture: Bones of hand, thenar, hypothenar eminences
36.	Extensor Compartment of Forearm- Superficial muscles, Deep muscles
37.	Median and Ulnar Nerves in Hand &Dorsal Digital Expansion
38.	Extensor Retinaculum, Small muscles of hand
39.	Wrist Joint, Radio ulnar joints
40.	Arteries & Nerves of Extensor Compartment
41.	1st carpometacarpal joint & other Small joints of hand
42.	4thSubstage
43.	Radiology & Surface Marking



44.	Final Stage (Written)
45.	Final Stage ORAL
46.	Final Stage OSPE

Facilitator:

Batch A: Dr. Waqas Iqbal Butt

Batch B: Dr. Sidra Naeem

Batch C: Dr. Shbra Rafaqat

Lower Limb (Teaching Schedule 2020-21)

Sr. No	Topic
1.	Anatomy Lecture: Superficial fascia, Cutaneous innervation, Saphenous opening
2.	Hip Bone
3.	Fascia lata, Femoral sheath
4.	Femoral hernia, Femoral Vessels
5.	Muscles of Medial compartment of Thigh
6.	Anatomy Lecture: Femoral Triangle, Muscles of Anterior Compartment of Thigh
7.	1st Substage (Oral)
8.	Adductor Canal, Obturator Nerve, Obturator Artery
9.	Femur, Fascia of back of thigh
10.	Muscles of Gluteal region, Structures under gluteus maximus, Cutaneous innervations
11.	Anatomy Lecture: Lumbar Plexus, Nerves & Vessels of Gluteal Region
12.	Muscles of Back of thigh, Sciatic nerve
13.	Popliteal fossa and its contents, Anastomosis at back of thigh
14.	Hip joint, Hip joint Movements
15.	2nd Substage (Written)
16.	Anatomy Lecture: Muscles of anterior compartment of leg & Dorsum of foot, Retinaculae
17.	Tibia
18.	Fibula
19.	Anterior tibial artery & Dorsalis Pedis Artery. Deep Peroneal Nerve
20.	Knee joint
21.	Anatomy Lecture: Knee Joint Movements, Locking, Unlocking



22.	Lateral compartment of leg, Peroneal retinacula
23.	Muscles of back of leg
24.	3rdSubstage (OSPE)
25.	Flexor retinaculæ, Saphenous veins & nerve
26.	Tibial nerve, Posterior tibial artery
27.	Peroneal artery, Anastomosis around knee joint
28.	Sole of foot – Muscles, Vessels and nerves
29.	Anatomy Lecture: Tibiofibular joint, Lymphatic drainage of lower limb
30.	Ankle joint
31.	Arches of foot
32.	Subtalar joint and other joints of foot
33.	4thSubstage (Oral)
34.	Anatomy Lecture: Radiology & Surface marking
35.	Final Stage (Written)
36.	Final Stage (OSPE+VIVA)
37.	Final Stage (OSPE+VIVA)

Facilitator:

Batch A: Dr. Shibra Rafaqat

Batch B: Dr. Waqas Iqbal Butt

Batch C: Dr. Sidra Naeem

Thorax (Teaching Schedule 2020-21)

Sr. No	Topic
1.	Anatomy Lecture: Walls of Thorax, Joints of Thorax
2.	Sternum
3.	Ribs
4.	Thoracic vertebrae
5.	Trachea, Esophagus
6.	Anatomy Lecture: Diaphragm
7.	Thoracic Duct
8.	Aorta



9.	Superior vena cava
10.	Azygous & Hemiazygous
11.	Anatomy Lecture: Mediastinum
12.	Substage I (Oral)
13.	Pericardium
14.	Heart
15.	Heart
16.	Anatomy Lecture: Blood supply of Heart
17.	Bronchial Tree
18.	Lungs, Bronchopulmonary system
19.	Clinical correlates
20.	Substage II (OSPE)
21.	Anatomy Lecture: Radiology, Surface Marking
22.	Stage Written
23.	Stage OSPE
24.	Stage Viva
25.	Stage Viva

Facilitator:

Batch A: Dr. Sidra Naeem

Batch B: Dr. Shbra Rafaqat

Batch C: Dr. Waqas Iqbal Butt

Schedule of Histology Practicals MBBS 1st Year (Session 2020-2021)

Sr. No	Practicals
1.	Microscope
2.	Staining techniques
3.	Artifacts + Exfoliative cytology
4.	Cell shapes
5.	Epithelium-I
6.	Epithelium-II
7.	Glands



8.	Connective Tissue Proper –I
9.	Connective Tissue Proper –II
10.	Cartilage
11.	Bone
12.	Muscle
13.	Peripheral Nerve
14.	Ganglion
15.	Spinal cord
16.	Revision
17.	Cerebrum + Cerebellum
18.	Circulatory system
19.	Lymph node
20.	Tonsil + Thymus
21.	Spleen
22.	Epiglottis
23.	Larynx + Trachea
24.	Lungs
25.	Skin
26.	Mammary Gland

Facilitator:

Dr. Ammara Ghafoor



LIST OF TOPICS IN THE SUBJECT OF ANATOMY AND THEIR LEARNING OBJECTIVES

General Anatomy

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Disciplines of Anatomy & Body organization	Knowledge <ul style="list-style-type: none">➤ Define general anatomical terms and sectional planes of human body.➤ Conceptualize the general organization of human body.	LGIS (Large group interactive session)
Integumentary System& fascia	Knowledge <ul style="list-style-type: none">➤ Enumerate the components of integumentary system.➤ Enlist the functions of integumentary system➤ Enlist the two main parts of skin. Enumerate its layers with their general features.➤ Enumerate appendages of skin.➤ Define cleavage lines? Describe their clinical importance.➤ Explain the clinical significance of discoloration of skin (jaundice, cyanosis and anemia).➤ Explain the structure and function of superficial & deep fascia.	LGIS (Large group interactive session)
Skeletal System	Knowledge <ul style="list-style-type: none">➤ Classify the appendicular and axial skeletal system➤ Describe general surface features of human bones.➤ Explain the functions of bones➤ Classify bones on the basis of shape & size, evolution, structure, development, region and miscellaneous parameters.➤ Explain the phenomenon of ossification, bone growth and neurovascular supply.➤ Describe the blood supply of bones.➤ Correlate the aforementioned anatomical knowledge clinically to fractures & their healing, rickets, osteoporosis, scurvy, osteomalacia, sternal puncture and avascular necrosis.➤ Classify cartilage with examples.➤ Classify joints mentioning features of each with examples.➤ Discuss the characteristics, types and movement of synovial, cartilaginous and fibrous joints with relevant examples.	LGIS (Large group interactive session)

	<ul style="list-style-type: none"> ➤ Describe the factors responsible for the stability of joints. ➤ Explain the general principles of blood and nerve supply of joints. ➤ Correlate aforementioned anatomical knowledge. 	
Muscles	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Classify muscles with appropriate examples from each region of the body. ➤ Describe parts and features of muscles in general. ➤ Describe general principles of blood and nerve supply of muscles. ➤ Define and explain the mechanism of sprain, spasm, trophic degeneration and regenerative changes. ➤ Explain the synovial structures related to muscles (tendon sheaths, bursae). ➤ Describe related fibrous structures of skeletal muscles (aponeurosis, tendon, raphae). 	LGIS (Large group interactive session)
Nervous system	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe division of nervous system on gross anatomical basis. ➤ Enumerate components of central and peripheral nervous system. ➤ Describe their general features. ➤ Define autonomic nervous system (ANS). ➤ Enlist the differences between autonomic and somatic nervous system. ➤ Enlist the main divisions of ANS. ➤ Describe differences of its two main divisions in tabulated form. ➤ Enumerate cranial ganglia and parasympathetic ganglia. ➤ Define enteric nervous system. Describe its general features. 	LGIS (Large group interactive session)
Circulatory System	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Discuss the general structural plan of blood vessels. ➤ Classify blood vessels on anatomical and functional basis. ➤ Discuss general plan of systemic, pulmonary and coronary circulatory system. ➤ Discuss general plan of portal system with brief accounts of arterial and venous portal systems giving examples. ➤ Define anastomosis; describe various types of anastomosis with examples and their clinical significance. ➤ Describe blood supply of arteries and veins. ➤ Explain the importance of collateral circulation. 	LGIS (Large group interactive session)

Lymphatic System	Knowledge <ul style="list-style-type: none"> ➤ Discuss general plan of the lymphatic circulatory system of the body. ➤ Explain the mechanism of formation and flow of lymph. ➤ Enumerate the factors responsible for flow of lymph. ➤ Discuss the structural plan of lymphatic vessels. ➤ Describe the structural plan of lymph nodes and their role in lymphatic system. ➤ Enumerate the capsulated lymphoid organs. 	LGIS (Large group interactive session)
Radiographic Techniques	Knowledge <ul style="list-style-type: none"> ➤ Understand the basic underlying principles of X-rays, CT scan, Ultrasound and MRI. ➤ Identify anatomical structures in normal radiographs of different regions of the body. ➤ Interpret displacement of the fracture segments of the bone and dislocation of various joints of the body in radiographs. ➤ Identify structures in normal images of different imaging techniques (CT scans, MRI and Ultra-sonography) 	LGIS (Large group interactive session)



Embryology

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Mitosis & Meiosis	Knowledge <ul style="list-style-type: none">➤ Define Meiosis & differentiate first and second meiotic divisions.➤ State the phases of meiotic divisions.➤ Discuss the importance and result of meiosis in both sexes.➤ Differentiate between mitosis and meiosis.➤ Describe the structure abnormalities in chromosomes like Euploidy, Aneuploidy, Trisomy, Non-disjunction, Translation Correlate the structure abnormalities with clinical conditions like: Down's syndrome Klinefelter and Tuner syndromes.	LGIS (Large group interactive session)
	Knowledge <ul style="list-style-type: none">➤ Describe the events of spermatogenesis.➤ Describe the morphological changes during maturation of the gametes.➤ Enlist the differences between spermiogenesis and spermatogenesis. Define the ovarian cycle.➤ Describe the stages of follicular maturation.➤ Explain the hormonal control (FSH, LH) of ovarian cycle.➤ Discuss the transport of ovum from the surface of ovary to ampulla of fallopian tube.	LGIS (Large group interactive session)
Ovulation & Implantation	Knowledge <ul style="list-style-type: none">➤ Describe the process of fertilization.➤ Describe the results of fertilization.➤ Enumerate the changes that occur in spermatozoa before fertilization.➤ Correlate the transport of zygote from ampulla of fallopian tube to the uterine cavity.➤ Discuss cleavage & explain the formation of blastocyst.	LGIS (Large group interactive session)
1 st week of development	Knowledge <ul style="list-style-type: none">➤ Explain the formation of outer and inner cell masses.➤ Discuss the further development of outer cell mass (trophoblast).➤ Differentiate syncytiotrophoblast and cytotrophoblast with its microscopic appearance.➤ Describe the process of implantation (day wise change).	LGIS (Large group interactive session)
2 nd week of development	Knowledge <ul style="list-style-type: none">➤ State the differentiation of embryonic pole and development of bilaminar germ disc with formation of Epiblast and hypoblast, their cavities (amniotic cavity	LGIS (Large group interactive session)

	<p>and primary yolk sac).</p> <ul style="list-style-type: none"> ➤ Discuss the development of the chorionic sac and formation of primary chorionic villi and growth of syncytiotrophoblast. ➤ Explain the establishment of utero placental circulation. 	
3rd week of development	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Define gastrulation. ➤ Discuss the development of primitive streak and related congenital anomalies). ➤ Describe the development of notochordal process, notochord canal, prechordal plate and cloacal membrane. ➤ Define Neurulation List the steps of development of neural tube. ➤ Enumerate the derivatives of Neural Crest Cells. ➤ State the congenital anomalies resulting from abnormal Neurulation. ➤ Enlist the derivatives of three germ layers. ➤ Explain the embryological basis of the neural tube defects like anencephaly and spina bifida ➤ Define Somites. 	LGIS (Large group interactive session)
Embryonic period (3rd to 8th week)	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the development of intraembryonic coelom. ➤ Describe the folding of the embryo in the longitudinal & horizontal plane. ➤ Describe relocation of connecting stalk to the anterior abdominal wall and its differentiation into umbilical cord. ➤ Describe the process of formation of blood and blood vessels and differentiate between angiogenesis and vasculogenesis. ➤ Define hemangioma and explain its embryological basis. 	LGIS (Large group interactive session)
Fetal Period (third month to birth)	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Define fetal period. ➤ Enumerate various methods to estimate fetal age. ➤ Describe factors affecting fetal growth. ➤ Enlist the external body landmarks from third month to birth. ➤ Define intrauterine growth retardation. 	LGIS (Large group interactive session)
Placenta & Fetal membranes	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Enlist types of chorion and give fate of each. ➤ Enlist types of decidua and give fate of each. ➤ Enumerate the fetal and maternal components of placenta. ➤ Differentiate between stem, anchoring and terminal villi. ➤ Enumerate the layers forming placental barrier. 	LGIS (Large group interactive session)

	<ul style="list-style-type: none"> ➤ Describe placental circulation (maternal and fetal) & enumerate functions of the placenta. ➤ Enlist the features of maternal and fetal surfaces of placenta. ➤ List fetal membranes and their functions. ➤ Describe production, circulation and significance of the amniotic fluid. ➤ Describe the development of umbilical cord. ➤ Define preeclampsia and correlate it with trophoblastic differentiation. ➤ Describe the embryological basis of amniotic bands, umbilical cord defects, erythroblastosis fetalis and hydrops fetalis. ➤ Define poly and oligohydramnios. 	
Twinning	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Name two basic types of twins & describe the mechanism behind occurrence of dizygotic & monozygotic twins. ➤ Discuss the possible arrangements of fetal membranes in case of monozygotic twins. ➤ Discuss twin transfusion syndrome and conjoined twins. 	LGIS (Large group interactive session)
Birth defects	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Enumerate types of birth abnormalities ➤ Summarize principles of teratology. ➤ Enlist numerical & structural chromosomal abnormalities. ➤ Discuss the following numerical chromosomal abnormalities: ➤ Trisomy 21, Trisomy 18, Trisomy 13, Klinefelter syndrome and Turner syndrome. ➤ Discuss the following structural chromosomal abnormalities: Cri-du-chat syndrome Angel-man's syndrome Prader-willi syndrome Miler-dieker syndrome. ➤ Define mosaicism& discuss its embryological basis. 	LGIS (Large group interactive session)
Development of Skeletal system	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe development of vertebral column. ➤ Define spina bifida. Enlist its different types. ➤ Give embryological basis of bifid spine along with methods of prenatal assessment in this anomaly. ➤ Explain development of ribs and sternum with congenital defects. ➤ Discuss embryological basis and associated birth defects. ➤ Describe the formation of limb buds Define apical ectodermal ridge and discuss its role in limb development including digits. ➤ Discuss rotation of limbs during development & discuss the relationship between rotation of limbs & 	LGIS (Large group interactive session)

	<p>cutaneous nerve supply of limbs.</p> <ul style="list-style-type: none"> ➤ Differentiate between development of upper and lower limbs. ➤ Enumerate & describe various types of limb defects. 	
Development of muscular system	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe development of skeletal musculature. ➤ Define lateral somitic frontier. ➤ Enumerate the muscles derived from primaxial and abaxial domains. ➤ Summarize the innervation of axial skeletal muscles. ➤ Enlist the developmental source of: Head muscles, Limb muscles, Cardiac muscles and Smooth muscles. ➤ Discuss the related clinical anomalies. 	LGIS (Large group interactive session)
Development of Integumentary System	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the development of integumentary system including mammary gland with their anomalies. 	LGIS (Large group interactive session)



Histology

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Cell (introduction, staining, cytoskeleton, cell junctions)	Knowledge <ul style="list-style-type: none">➢ Discuss the working & magnification of Light Microscope.➢ Describe the steps involved in tissue processing.➢ Define cell, identify various types of cells and shapes. Define Cytoskeleton.➢ Enumerate the cell junctions and describe their histological structure. Skill <ul style="list-style-type: none">➢ Identify and draw the different parts of microscope and illustrate their usage.➢ Focus the prepared slide at different magnifications.➢ Identify the different shapes of cells and their examples.➢ Draw & label the diagram of different types of shapes of cells.	LGIS(Large group interactive session) LAB
Surface & glandular epithelium	Knowledge <ul style="list-style-type: none">➢ Classify the body tissue into categories.➢ Define & classify various types of Epithelium.➢ Discuss general features of epithelial cells (basal, apical and lateral surfaces).➢ Explain the different types of epithelium with examples.➢ Describe glandular epithelium.➢ Differentiate the structure of serous and mucus secreting cells. Skill <ul style="list-style-type: none">➢ Identify the different types of Epithelia.➢ Draw a labeled diagram of different types of simple and stratified epithelia.➢ Draw a labeled diagram of different types of glandular epithelia.	LGIS(Large group interactive session) LAB
Connective Tissue (General)	Knowledge <ul style="list-style-type: none">➢ Explain the components of connective tissue.➢ Describe different types of cells in connective tissue.➢ Describe different types of fibers in connective tissue.➢ Discuss various constituents of ground substance.➢ Classify various types of connective tissue. Skill <ul style="list-style-type: none">➢ Identify the microscopic structure of loose connective tissue, dense regular and irregular	LGIS(Large group interactive session) LAB

	<p>connective tissue.</p> <ul style="list-style-type: none"> ➤ Draw a labeled diagram showing the microscopic structure of loose connective tissue, dense regular and irregular connective tissue. 	
Bone	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe microscopic features of bones and types of ossification. ➤ Enlist the location of different types of bones. ➤ Describe the various types of bone cells. <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify different types of bone microscopically. ➤ Draw a labeled diagram showing the histological structure of compact & spongy bone 	LGIS(Large group interactive session) LAB
Cartilage	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe microscopic features of various types of cartilage. ➤ Explain chondrocyte. <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify different types of cartilage microscopically. ➤ Draw a labeled diagram showing the histologic structure of different types of cartilage. 	LGIS(Large group interactive session) LAB
Muscle	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the microscopic features of skeletal, smooth and cardiac muscle. ➤ Describe the differences between various types of muscles. <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify the different types of muscle microscopically. ➤ Draw a labeled histological diagram of different types of muscles. 	LGIS(Large group interactive session) LAB
Circulatory System	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Discuss the general structural plan of blood vessels. ➤ Describe and compare the histological structure of: <ul style="list-style-type: none"> • Elastic artery • Muscular artery • Arteriole • Different types of Capillaries • Venule • Medium sized vein • Large vein <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify elastic artery, muscular artery and large vein under light microscope. ➤ Draw labeled diagram of various blood vessels. 	LGIS(Large group interactive session) LAB
Immune	Knowledge	LGIS(Large

System	<ul style="list-style-type: none"> ➤ Enumerate the cells of immune system. ➤ Describe the structure of primary and secondary lymph nodule. ➤ Describe the histological features of: Lymph node, Thymus, Spleen and Tonsil. <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify slides of lymph node, thymus, spleen and palatine tonsils under light microscope. ➤ Draw labeled diagram of lymph node, thymus, spleen and palatine tonsils. 	group interactive session) LAB
Respiratory system	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Enlist the main divisions of respiratory passage along with the structures constituting each. ➤ Define respiratory and olfactory epithelium. ➤ Describe the histological structure of the following with the help of diagram: <ul style="list-style-type: none"> ● Paranasal air sinuses ● Nasopharynx ● Larynx ● Trachea ● Lungs ● Pleura ➤ Differentiate various parts of bronchial tree on the basis of lining epithelium, presence of cilia, glands, cartilage, smooth muscles, and elastic fibers. <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify slides of epiglottis, larynx, trachea & lungs under light microscope. ➤ Draw labelled diagram of epiglottis, larynx, trachea & lungs. 	LGIS(Large group interactive session) LAB
Integumentary System	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Explain the histological structure of skin. ➤ Explain the functions of skin. ➤ Differentiate between thick & thin skin. ➤ Describe the structure of mammary gland. <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify slides of thick & thin skin and mammary gland under light microscope. ➤ Draw labelled diagram of thick & thin skin and mammary gland under light microscope. 	LGIS(Large group interactive session) LAB
Nervous System	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the structure of neuron & glial cells. ➤ Explain the various types of synapses. ➤ Explain the structure of peripheral nerve. ➤ Explain the types of ganglia. ➤ Explain the histological structure of spinal cord, cerebellum and cerebrum and correlate it to the functions. 	



	<p>Skill</p> <ul style="list-style-type: none">➤ Identify peripheral nerve, ganglia, spinal cord, cerebral & cerebellar cortex microscopically.➤ Draw a labeled diagram showing the histological structure of peripheral nerve, ganglia, spinal cord, cerebral & cerebellar cortex.	
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Gross Anatomy

Upper Limb

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Bones of Upper Limb	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Identify important bony land marks of Scapula, Clavicle, Humerus, Radius, and Ulna. ➤ Describe the attachment of muscles& ligaments of Scapula, Clavicle, Humerus, Radius, and Ulna. ➤ Identify the different types of fractures of humerus & nerve injuries. ➤ Identify the common sites of fractures of radius & Ulna. <p>Skill</p> <ul style="list-style-type: none"> ➤ Demonstrate the anatomical position of bone and their side determination. ➤ Draw & label the arterial anastomosis around scapula. 	SGD/ Demo
Breast	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the structure and divisions of breast tissue. ➤ Discuss its blood supply & lymphatic drainage of each quadrant of breast. ➤ Discuss supernumerary, retracted nipples, breast abscess & CA breast. 	SGD/ Demo
Pectoral region	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the anatomy of muscles of pectoral region including origin insertion, nerve and blood supply & their actions. ➤ Describe the anatomy of clavipectoral fascia & structure piercing it. <p>Skill</p> <ul style="list-style-type: none"> ➤ Study prospected specimen and identify the muscles of this region. ➤ Perform dissection to identify main muscles of pectoral region along with their nerve supply. 	SGD/ Demo
Scapular region	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the anatomy of muscles connecting the upper limb to thoracic wall including origin insertion, nerve and blood supply & their actions. ➤ Describe the anatomy of muscles connecting the scapula to humerus including origin 	SGD/ Demo

	<p>insertion, nerve and blood supply & their actions.</p> <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify the boundaries, contents of quadrangular and triangular spaces. ➤ Study prospected specimen and identify the muscles of this region. ➤ Perform dissection to identify main muscles of scapular region along with their nerve supply. 	
Acromioclavicular and sternoclavicular joint (Shoulder Girdle)	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the type, articulation ➤ Ligaments & movements of these joints. ➤ Discuss scapulohumeral mechanism. ➤ Discuss blood supply & nerve supply of these joints. ➤ Discuss injury and dislocation of these joints. <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform movements of shoulder girdle. 	SGD/ Demo
Shoulder joint	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe type, articulation, movements, ligaments, nerve supply & blood supply of shoulder joint. ➤ Describe arterial anastomosis around shoulder joint. ➤ Describe the dislocation of shoulder joint ➤ Explain rotator cuff & enumerate the injuries to it. <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform movements of shoulder joint. ➤ Study the model of shoulder joint and mark its ligaments & rotator cuff muscles around it. ➤ Draw & label the arterial anastomosis around shoulder joint. 	SGD/ Demo
Axilla & Brachial Plexuses	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the boundaries& contents of Axilla. ➤ Describe injury to the axillary vein & artery. ➤ Describe axillary lymph nodes, their location and area of drainage &discuss lymphangitis and lymphadenitis. ➤ Describe the importance of axillary lymph nodes in CA breast. ➤ Describe formation of Brachial Plexus with emphasis on Cords, Roots & trunk. ➤ Discuss injuries of the brachial plexus. ➤ Describe the relation of cords of brachial plexus. ➤ Discuss its variations & related injuries. <p>Skill</p>	SGD/ Demo

	<ul style="list-style-type: none"> ➤ Study prosected specimen and models of axilla and its contents. 	
Arm	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Discuss anterior and posterior compartment of arm &structures present in it. ➤ Discuss origin, insertion of muscles of anterior and posterior compartment of arm with blood supply and nerve supply of these compartments. <p>Skill</p> <ul style="list-style-type: none"> ➤ Study the models and prosected specimen of arm &identify the structures present in this region. ➤ Perform dissection to identify main muscles of arm along with their nerve supply. 	SGD/ Demo
Elbow joint Proximal and distal radioulnar joints	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the type, articulation, ligaments & movements of these joints. ➤ Discuss blood supply and nerve supply of these joints. ➤ Describe the anatomical significance of carrying angle. ➤ Discuss dislocation and clinical correlation of these joints. <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform movements at elbow joint and discuss the muscles involved in these movements. ➤ Study the models of elbow joint and recognize the bones & ligaments forming the joint. ➤ Draw & label the arterial anastomosis around elbow joint. 	SGD/ Demo
Cubital Fossa	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the boundaries& contents of cubital fossa. ➤ Discuss the importance of structures present in cubital fossa. <p>Skill</p> <ul style="list-style-type: none"> ➤ Mark the boundaries and contents of cubital fossa on a model. ➤ Perform dissection to identify muscles & contents forming boundaries of cubital fossa. 	SGD/ Demo
Forearm	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe contents& muscles of anterior lateral and posterior fascial compartments of forearm. ➤ Discuss the course of nerves and arteries 	SGD/ Demo

	<p>present in this region. Discuss boundaries of anatomical snuff box and its importance.</p> <ul style="list-style-type: none"> ➤ Describe flexor and extensor retinaculum. ➤ Discuss clinical correlations of this compartment. <p>Skill</p> <ul style="list-style-type: none"> ➤ Study prospected specimen of forearm and identify muscles, blood vessels and nerves present in this region. ➤ Study the models of forearm and discuss origin & insertion of muscles. ➤ Mark the extensor and flexor retinacula on the model. ➤ Perform dissection to identify main muscles of forearm along with their nerve supply. 	
Palm of Hand	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Discuss bones of hand. ➤ Describe functions of muscles in thenar & hypothenar muscles. ➤ Describe the fibrous sheaths of the digits of the hand ➤ Discuss the anatomical structures involved in tenosynovitis. ➤ Describe palmar aponeurosis. ➤ Enumerate fascial spaces of Palm. ➤ Discuss clinical importance of spaces of palm. ➤ Explain the formation & contents of carpal tunnel and discuss carpal tunnel syndrome. ➤ Describe the course & branches of arteries & nerves in hand. <p>Skill</p> <ul style="list-style-type: none"> ➤ Study the model of hand to visualize muscles of hand and insertion of long tendons ➤ Study prospected specimen of hand to identify muscles and blood vessels of hand. ➤ Perform dissection to identify main muscles of hand along with their nerve supply. 	SGD/ Demo
Metacarpophalangeal & interphalangeal joints Wrist joint	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Discuss metacarpophalangeal and interphalangeal joints of hand. ➤ Discuss the type, articulation, ligaments & movements at wrist joint. <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform movements of wrist joint and recognize the muscles involved in these movements. 	SGD/ Demo
Nerves of upper limb	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe formation, distribution & important relations of following nerves: 	SGD/ Demo

	<ul style="list-style-type: none"> • Axillary nerve • Musculocutaneous nerve • Median nerve • Radial nerve • Ulnar nerve <p>➤ Discuss the anatomical sites of lesion of nerve correlating them to sensory and motor loss within area of distribution</p>	
Cutaneous nerves of upper limb	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the cutaneous innervation of the arm, forearm & hand. ➤ Compare and contrast the dermatomes with the cutaneous innervation of specific nerves in arm & forearm. <p>Skill</p> <ul style="list-style-type: none"> ➤ Draw & label cutaneous innervation of upper limb. ➤ Draw & label the dermatomes of upper limb. 	SGD/ Demo
Blood supply of upper limb	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Discuss the course, extent & branches of Axillary, Brachial, Ulnar and Radial arteries. ➤ Describe the clinical correlates related to these vessels. ➤ Describe the formation of Superficial and Deep Palmar Arches in hand. ➤ Describe the formation & drainage of following Veins: Axillary, Basilic, Cephalic, and Median cubital. ➤ Discuss the importance of Median Cubital Vein in venipuncture. 	SGD/ Demo
Lymphatic drainage of upper limb	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the lymphatic drainage of upper limb. 	SGD/ Demo
Surface Marking	<p>Skill</p> <ul style="list-style-type: none"> ➤ Mark the nerves and vessels of upper limb on the surface of region & important bony landmarks on a subject. 	SGD/ Demo
Imaging	<ul style="list-style-type: none"> ➤ Identify the common sites of fracture on radiographs correlating its predisposition to fracture in the following bones: <ul style="list-style-type: none"> • Scapula • Clavicle • Humerus • Radius • Ulna ➤ Identify the bony landmarks and bony articulations of upper limb on AP and Lateral view of Radiographs. 	SGD/ Demo



LOWER LIMB

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Hip Bone	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe important bony land marks of hip bone. ➤ Describe the muscles & ligamentous attachments on hip bone. ➤ Discuss injuries related to hip bone and compare gender differences of hip bone. <p>Skill</p> <ul style="list-style-type: none"> ➤ Demonstrate the anatomical position of bone & side determination. ➤ Recognize important bony land marks on gross inspection & identify the muscles & ligamentous attachments on bone. 	SGD/ Demo
Gluteal Region	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the origin, insertion, nerve supply and action of gluteal muscles. ➤ Enumerate structures deep to gluteus maximus. ➤ Describe boundaries of greater sciatic and lesser sciatic foramina and enumerate structures passing through them. ➤ Discuss the origin, relations and main branches of nerves and vessels of gluteal region & related clinicals. <p>Skill</p> <ul style="list-style-type: none"> ➤ Explore and identify the structural anatomy of gluteal region with the help of dissection. ➤ Study prospected specimen and identify the muscles of this region. 	SGD/ Demo
Femur	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the muscle & ligamentous attachments on bone ➤ Describe fractures and related clinicals including coxa vara and coxa valga & interruption of blood supply to head & neck of femur. <p>Skill</p> <ul style="list-style-type: none"> ➤ Demonstrate the anatomical position of bone & side determination. ➤ Recognize important bony land marks on gross inspection. 	SGD/ Demo
Anterior fascial Compartment of Thigh	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the boundaries, compartments, contents and importance of femoral sheath. 	SGD/ Demo

	<p>Describe the anatomy of muscles of anterior facial compartments of thigh.</p> <ul style="list-style-type: none"> ➤ Describe the origin, course and termination of great saphenous vein. ➤ Describe the fascia lata and opening contained in it. ➤ Describe the anatomy of muscles of anterior facial compartments of thigh. ➤ Explain the boundaries and contents of femoral canal identify the boundaries and contents of femoral triangle. <p>Skill</p> <ul style="list-style-type: none"> ➤ Explore and identify the structural anatomy of anterior compartment of thigh with the help of dissection. ➤ Study prospected specimen and identify the muscles of this region. 	
Medial fascial Compartment of Thigh	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the origin, insertion, nerve supply and actions of muscles of medial facial compartments of thigh. ➤ Describe the origin, course & branches of obturator nerve the clinical scenario related with obturator nerve. <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform dissection to identify main muscles of medial compartment of thigh along with their nerve supply. ➤ Study prospected specimen and identify the muscles of this region. 	SGD/ Demo
The back of the thigh	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the origin, insertion, nerve supply and actions of muscles of posterior facial compartments of thigh. ➤ Describe the origin, course & branches of sciatic nerve the clinical scenario related with sciatic nerve. <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform the dissection to understand the structural anatomy of back of thigh. ➤ Study prospected specimen and identify the muscles of this region. 	SGD/ Demo
Hip joint	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the articulation, type, capsule, ligaments, synovial membrane, nerve supply, blood supply and important relations of hip joint. ➤ Discuss the various movements of hip joint along with muscles responsible for these movements. Discuss the fractures & 	

	<p>dislocation of hip joint.</p> <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform movements of hip joint. ➤ Study the model of hip joint and mark its ligaments & muscles around it. 	
Bones of leg	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Discuss patellar dislocations & patellar fractures. ➤ Describe and identify the muscle & ligamentous attachments on tibia & fibula. ➤ Identify the common sites of fractures of tibia and fibula and correlate them with their clinical presentations. <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify the patella and its bony landmarks. ➤ Demonstrate the anatomical position of tibia & fibula and determine their side determination. ➤ Recognize important bony land marks on gross inspection. 	SGD/ Demo
Popliteal Fossa	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the boundaries & contents of popliteal fossa. ➤ Discuss genicular anastomosis and its clinical significance. <p>Skill</p> <ul style="list-style-type: none"> ➤ Explore and identify the structural anatomy of popliteal fossa after performing dissection. ➤ Draw and label genicular anastomosis. 	SGD/ Demo
Fascial compartments of leg	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Enumerate the contents of anterior, lateral and posterior compartments of leg. ➤ Describe origin, insertion and actions of muscles contained within anterior, lateral and posterior compartment of leg. ➤ Explain blood and nerve supply of anterior, lateral and posterior compartment of leg. ➤ Discuss the different clinical conditions related with these structures in the region of leg. ➤ Describe the retinaculae of ankle with reference to their attachments and structures passing underneath them. ➤ Analyze the clinical scenarios related with common peroneal nerve and tibial nerve injuries. <p>Skill</p> <ul style="list-style-type: none"> ➤ Explore and identify the structural anatomy of fascial compartments of leg with the help of dissection. 	SGD/ Demo
Knee joint	Knowledge	SGD/ Demo

Proximal & distal Tibiofibular joints	<ul style="list-style-type: none"> ➤ Describe the articulation, type, capsule, ligaments (extra and intra articular), synovial membrane, nerve supply, blood supply, important relations, and movements related to the knee joint. ➤ Explain the mechanism of locking and unlocking of the knee joint. ➤ Name the bursae related to knee joint and point out those which communicate with the joint cavity. ➤ Discuss the clinical scenarios related with patellar tendon reflex and various types of bursitis. ➤ Discuss the injuries related to knee joint. ➤ Describe the articulation, type, capsule, ligaments, nerve supply, blood supply, and movements related to tibiofibular joints. <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform movements of knee joint. ➤ Study the model of knee joint and mark its ligaments & muscles around it. 	
Ankle joint	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the articulation, type, capsule, ligaments, synovial membrane, nerve supply, blood supply, movements and important relations of the joint. ➤ Describe the fracture dislocation of ankle joint. ➤ Discuss the clinical scenario related with Achilles tendon reflex. <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform movements of ankle joint. ➤ Study the model of ankle joint and mark its ligaments & muscles around it. 	SGD/ Demo
Articulated foot	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe articulation among various bones of foot. ➤ Describe foot as a functional unit. ➤ Describe arches of foot with reference to bones of arches, and mechanisms of arch support. ➤ Discuss mechanism of walking. ➤ Discuss the clinical problems associated with the arches of foot. <p>Skill</p> <ul style="list-style-type: none"> ➤ Identify the bones of foot Demonstrate anatomical position and determine their side determination of calcaneum and talus. ➤ Identify important bony landmarks, muscular & ligamentous attachments on calcaneum & talus. 	SGD/ Demo
Intertarsal joints	<p>Knowledge</p>	SGD/ Demo



	<ul style="list-style-type: none"> ➤ Identify articulation, type of joint, important ligaments and movements at these joints. 	
Sole of foot	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the attachments and relations of plantar aponeurosis. ➤ Describe in tabulated form the origin, insertion, nerve supply and action of muscles of sole of foot. ➤ Describe arteries and nerves of sole of foot. <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform the dissection to identify the structural anatomy of six layers of sole of foot. 	SGD/ Demo
The dorsum of foot	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the origin, insertion, nerve supply and action of extensor digitorum brevis ➤ Describe arteries and nerves of dorsum of foot <p>Skill</p> <ul style="list-style-type: none"> ➤ Perform the dissection to identify the structural anatomy of dorsum of foot. 	SGD/ Demo
Cutaneous innervations of lower limb	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the cutaneous nerve supply of lower limb. <p>Skill</p> <ul style="list-style-type: none"> ➤ Draw & label cutaneous innervation of lower limb. ➤ Draw & label the dermatomes of lower limb. 	SGD/ Demo
Blood supply of lower limb	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Discuss the course, extent & branches of femoral, popliteal &tibial arteries. 	SGD/ Demo
Lymphatic drainage of lower limb	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Describe the lymphatic drainage of lower limb in detail. 	SGD/ Demo
Surface Marking	<p>Skill</p> <ul style="list-style-type: none"> ➤ Mark the nerves and vessels of lower limb on the surface of region & important bony landmarks on a subject. 	SGD/ Demo
Imaging	<ul style="list-style-type: none"> ➤ Identify the common sites of fracture & bony landmarks on AP and Lateral view of radiographs in the following bones: <ul style="list-style-type: none"> • Hip bone • Femur • Tibia • Fibula 	SGD/ Demo



THORAX

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Thoracic wall (Bones and soft parts)	Knowledge <ul style="list-style-type: none">➤ Enumerate the bones contributing in thoracic cage.➤ Describe the bony framework of the thoracic cage.➤ Identify structures forming the thoracic inlet and outlet/costal margin.➤ Discuss sternum, with reference to its parts and attachments.➤ Define sternal angle and discuss its importance in clinical practice. Describe the joints of thorax with reference to their types and movements.➤ Discuss and differentiate between the pump handle and bucket handle movements and their effect on diameters of chest cavity.➤ Discuss the role of the accessory respiratory muscles during inspiration and expiration.➤ Enlist the contents of a typical intercostal space including muscles, nerves and vessels.➤ Describe the attachments, actions and nerve supply of thoracic muscles.➤ Discuss the arterial supply and venous drainage of the thoracic wall.➤ Discuss the course and distribution of a thoracic spinal nerve.➤ Discuss chest intubation. Skill <ul style="list-style-type: none">➤ Classify ribs into true and false.➤ Determine side of ribs.➤ Discuss parts of a typical rib.➤ Differentiate between typical and atypical ribs.➤ Identify typical thoracic vertebra; describe its different parts and identification points.➤ Compare a typical and atypical thoracic vertebra.	SGD (Small group discussion)/ Demo
Diaphragm	Knowledge <ul style="list-style-type: none">➤ Describe the parts, attachments and nerve supply of diaphragm.➤ Enlist the apertures in diaphragm with their levels and structures passing through each.➤ Discuss the clinical scenario related to diaphragmatic hernia and phrenic nerve lesions.	SGD (Small group discussion)/ Demo
Pleura	Knowledge <ul style="list-style-type: none">➤ Enumerate and discuss various parts of pleura and identify their locations.➤ Describe the innervation of the visceral and parietal layers of the pleura.	SGD (Small group discussion)/ Demo

	<ul style="list-style-type: none"> ➤ Define pleural effusion, pneumothorax, empyema and hemothorax. 	
Lungs	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Identify the side of lungs, borders and surfaces of lungs. ➤ Discuss the arrangement of structures in hilum of each lung. ➤ Discuss the blood supply, nerve supply, lymphatic drainage and relations of various surfaces of both lungs. ➤ Define bronchopulmonary segments. Enlist them in each lung. Discuss their significance. ➤ Discuss with anatomical reasoning, the clinical presentation of bronchogenic carcinoma and lung trauma 	SGD (Small group discussion)/ Demo
Mediastinum	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Define mediastinum Outline the boundaries of each division of mediastinum. <p>Anterior Mediastinum</p> <ul style="list-style-type: none"> ➤ Enumerate the contents of anterior mediastinum. Describe the shape, relations and blood supply of thymus <p>Superior Mediastinum</p> <ul style="list-style-type: none"> ➤ Enumerate the contents of superior mediastinum. ➤ Identify carina at the site of bifurcation of trachea into main principal bronchi. ➤ Describe immediate relations, blood and nerve supply of thoracic part of trachea. ➤ Describe the orientation, relations and branches of arch of aorta ➤ Describe the formation, relations and tributaries of superior vena cava and brachiocephalic veins. ➤ Describe the origin, course, relations and distribution of both phrenic nerves. <p>Posterior Mediastinum</p> <ul style="list-style-type: none"> ➤ Enumerate the contents of posterior mediastinum. ➤ Describe the relations and branches of descending aorta. ➤ Describe the course, relations and constrictions of thoracic part of esophagus. ➤ Describe the thoracic duct with reference to its formation, course, tributaries, termination and area of drainage. ➤ Discuss the azygos system of veins with reference to formation, course, relations, tributaries and area of drainage of both azygos and hemiazygos veins. 	SGD (Small group discussion)/ Demo
Pericardium	<p>Knowledge</p> <ul style="list-style-type: none"> ➤ Enumerate various layers of pericardium. Describe the gross features of fibrous & serous pericardium. ➤ Describe the reflections of parietal and visceral pericardium resulting in formation of transverse and oblique sinuses. ➤ Discuss the innervation of various layers of the pericardium Define pericarditis and pericardial effusion. ➤ Discuss pericardiocentesis. 	SGD (Small group discussion)/ Demo

Heart	Knowledge <ul style="list-style-type: none"> ➤ Describe anatomical position, borders, surfaces, apex and base of heart. ➤ Describe external & internal features of various chambers of heart. ➤ Enumerate the structures comprising the cardiac skeleton and describe its significance. ➤ Describe the arterial supply of heart Explain the basis of right or left dominance of heart. ➤ Describe the venous drainage of heart. ➤ Describe nerve supply of heart Define angina pectoris, myocardial infarction and cardiac tamponade. Skill <ul style="list-style-type: none"> ➤ Identify surfaces, borders, external & internal features of heart on specimen or model. 	SGD (Small group discussion)/ Demo
Dissection	Skill <ul style="list-style-type: none"> ➤ Identify muscles, bones, ligaments, nerves, vessels, organs and their parts located in thorax with the help of dissection. ➤ Identify muscles, bones, ligaments, nerves, vessels, organs and their parts prosected specimens and models. 	SGD (Small group discussion)/ Demo
Surface Marking	Skill <ul style="list-style-type: none"> ➤ Identify the important bony landmarks of thorax and mark them on a subject. ➤ Mark the borders of lungs, pleural reflections, borders and apex of heart, valves of heart, thoracic duct, esophagus, trachea, main vessels and nerves of thorax on the given subject. 	SGD (Small group discussion)/ Demo
Imaging	Skill <ul style="list-style-type: none"> ➤ Identify the bones of thorax, aortic knuckle, and borders of heart, lungs, trachea, hilar shadows, diaphragm and its recesses on chest radiographs. 	SGD (Small group discussion)/ Demo



Assessment Plan 1st Year MBBS Anatomy Department SMDC, Lahore

Following modes of assessment are planned for 1st year MBBS class in the subject of Anatomy. This plan has been designed keeping in view the university curriculum and hopefully will facilitate the students in preparing for 1st professional examinations in the subject.

Component Tests:

These will be conducted at the completion of every Component (General Anatomy/Embryology/Histology). The test will comprise of MCQs and SEQs on the pattern of university examinations.

Gross Anatomy Region Tests:

Gross Anatomy Regions are subdivided into substages followed by a final stage. The substages and stage will comprise of MCQs, SEQs, OSPE & Viva on the pattern of university examinations.

Practical OSPE Tests:

In order to prepare the students for practical examinations at least two OSPE tests will be conducted on the pattern of university examinations.

Pre-annual Exam:

This will be undertaken in coordination with other departments, exactly following the format of university professional examinations. It will comprise of MCQs, SEQs, OSPE and Viva voce.

Internal Assessment:

Internal assessment will be calculated out of 20 on the basis of all the tests that will be conducted throughout the year.

STAFF CONTACTS ANATOMY DEPARTMENT

Sr. No.	Name	Email address
1	Prof. Dr. Nausheen Raza	nausheen410@gmail.com
2	Prof. Dr. Tasneem A. Raza	tasnimaamerraza@gmail.com
2	Dr. Ammara Ghafoor	nabeeha.shahid1507@gmail.com
3	Dr. Nadia Ahmad	diaejaz_74@hotmail.com
4	Dr. Waqas Iqbal Butt	drwaqasiqb@gmail.com
5	Dr. Shibra Rafaqat	shibrarafaqat@gmail.com
6	Dr. Sidra Naeem	sidranaeem786@yahoo.com



PREScribed TEXT BOOKS & REFERENCES

RECOMMENDED BOOKS (Latest Edition):

1. General Anatomy by Prof. Tassaduq Hussain Sheikh
2. Medical Histology by Prof. Laiq Hussain Siddiqui
3. Cunningham's Clinical Dissector
4. Di-Fiore Atlas of Histology
5. Clinically Oriented Embryology by Keith L Moore
6. Clinically Oriented Anatomy by Keith Moore.
7. Cunningham's Manual of Practical Anatomy by G.J. Romanes, 15th Ed., Vol-I, II.

REFERENCE BOOKS

1. Clinical Anatomy by Snell.
2. Grant's Dissector of Anatomy.
3. Wheater's Functional Histology
4. Basic histology by Junqueira and Carniero
5. Grant's Atlas of Anatomy