

# **UHS CURRICULUM**

## **ANATOMY AND HISTOLOGY**

The course outline is as follows:-

1. History of anatomy and the different disciplines of the subject
2. Explain anatomical nomenclature

### **GENERAL ANATOMY**

#### **Skeletal System**

1. Axial skeleton
2. Different bones of human body
3. Axial and appendicular skeleton
4. Functions of bone
5. Classification on the basis of development, region and function
6. General concepts of ossification of bones
7. Parts of young bone
8. Blood supply of long bones
9. Anatomical factors in bone injury (clinical).

#### **Joints**

1. Structural , regional and functional classification of joints
2. Characteristics of synovial joints
3. Classification of synovial joints
4. Movements of synovial joints
5. Anatomy of joints with reference to dislocation and injury (clinical).

#### **Muscle**

1. Parts of a muscle
2. Classification of muscle
3. Blood supply and nerve supply of muscle
4. Anatomy of the neuromuscular junction
5. Anatomy of muscle with reference to sprain, spasm and injury

#### **Cardiovascular System**

1. The cardiovascular system
2. Arterial and venous system

#### **Lymphatic System**

1. Anatomy of lymph node
2. Anatomy of lymph vessels
3. Function of lymphatic system

## **Nervous System**

1. Nervous system in general
2. Different parts of nervous system and their functions
3. Anatomical arrangements of the cranial and spinal nerves in general
4. Autonomic nervous system

## **Skin and Fascia**

1. Brief anatomy of the skin, superficial and deep fascia

## **GENERAL HISTOLOGY**

1. Cell as a whole
2. Different components of a cell and description of its functions
3. Anatomy of cell membrane
4. Different parts of a microscope and their function
5. Types of epithelium and their anatomical location
6. Connective tissues and its function
7. Histological appearance of cartilage
8. Histological appearance of bone
9. Cartilage and bone
10. Identification of connective tissue, cartilage and bone under microscope
11. Histological features of muscle
12. Identification of muscle tissues under microscope
13. Histological features of central venous system
14. Histological features of peripheral nerve and spinal cord
15. Identification of nerve under microscope
16. Histology of lymphoid tissue
17. Identification of lymphoid tissue under microscope
18. Histology of blood vessel
19. Identification of blood vessel under microscope
20. Histology of skin
21. Identification of skin under microscope

## **GENERAL EMBRYOLOGY**

1. Male and female reproductive organs
2. Cell division and gametogenesis
3. Fertilization, cleavage, blastocyst formation and implantation of the embryo
4. Stages of early embryonic development in second and third week of intrauterine life
5. Development of embryo and foetus
6. Foetal membrane (amniotic cavity, yolk sac, allantois, umbilical cord and placenta)

## **GENETICS**

1. Basic principles of genetics
2. Structure and function of genes and DNA
3. Relationship of genes and DNA
4. Teratogenesis

## **GROSS ANATOMY**

The study of gross anatomy must lay emphasis on applied anatomy as related to clinical medicine and surgery, radiological anatomy, surface anatomy and cross sectional anatomy

Dissection, dissected specimens, models, and computer aided programs, x-rays and CT scans can be used.

### **Upper Limb**

Duration 11 weeks

### **Lower Limb**

Duration 11 weeks

### **Thorax**

Duration 7 weeks

### **Clinical Module**

1. Common developmental anomalies
2. Clinical effects of nerve injuries of the upper limb
3. Clinical effects of nerve injuries of the lower limb
4. Clinical importance of coronary circulation

## **RECOMMENDED BOOKS**

1. **Gray's Anatomy** by Prof. Susan Standring 39<sup>th</sup> Ed., Elsevier.
2. **Clinical Anatomy for Medical Students** by Richard S.Snell.
3. **Clinically Oriented Anatomy** by Keith Moore.
4. **Clinical Anatomy** by R.J. Last, Latest Ed.
5. **Cunningham's Manual of Practical Anatomy** by G.J. Romanes, 15<sup>th</sup> Ed., Vol-I, II and III.
6. **The Developing Human. Clinically Oriented Embryology** by Keith L. Moore, 6<sup>th</sup> Ed.
7. **Wheater's Functional Histology** by Young and Heath, Latest Ed.
8. **Medical Histology** by Prof. Laiq Hussain.
9. **Neuroanatomy** by Richard S.Snell.

## **PART-II**

### **SYSTEMIC HISTOLOGY**

#### **Digestive System**

3. Oral cavity, tongue, gums, hard palate, soft palate, pharynx and lips.
4. Oesophagus, stomach, duodenum, small intestine, large intestine, appendix.
5. Salivary gland.
6. Liver.
7. Pancreas and the difference between the endocrine and exocrine pancreas.
8. Gallbladder.

#### **Respiratory System**

10. Nasal cavity, paranasal sinuses. Larynx and trachea.
11. Bronchi and lungs.

#### **Male Reproductive System**

6. Testis, genital ducts and accessory genital glands.

#### **Female Reproductive System**

6. Ovaries, fallopian tube and uterus.
7. Vagina.
8. Mammary gland.

#### **Urinary System**

3. Kidney.
4. Ureter and urinary bladder.
5. Urethra.

#### **Endocrine System**

4. Pituitary gland.
5. Thyroid and parathyroid gland.
6. Adrenal gland and differences between the cortex and medulla.

#### **Eye and Ear**

5. Histological structure of the Eye.
6. Histological structure of the Ear.

## **SYSTEMIC EMBRYOLOGY**

### **Head Neck and Branchial Apparatus**

22. Development of the branchial apparatus and the structures which develop from each arch.
23. Development of the tongue.
24. Development of the thyroid and parathyroid.

### **Clinical Module**

5. Tracheo – oesophageal fistula.
6. Cleft lip and palate.

### **Digestive System**

5. Development of the body cavities, mesenteries and diaphragm.
6. Development of the liver, pancreas and gallbladder.
7. Development of the spleen.

### **Clinical Module**

10. Developmental defects of the diaphragm.
11. Developmental defects of the intestine and viscera.

### **Respiratory System**

1. Development of the respiratory system

### **Cardiovascular System**

1. Development of the heart and great vessels.
2. Foetal circulation and changes at birth.

### **Clinical Module**

1. Common congenital anomalies of the heart.

### **Urinary System**

1. Development of the kidneys, urinary bladder and urethra.

### **Male Reproductive System**

1. Development of the testis and genital duct.
2. Causes undescended testis.

### **Female Genital System**

1. Development of the ovaries, uterus and vagina.

### **Musculoskeletal System**

1. Development of the musculoskeletal system.

### **Nervous System**

1. Development of the nervous system.

## **GROSS ANATOMY**

The study of gross anatomy must lay emphasis on applied anatomy as related to clinical medicine and surgery, radiological anatomy, surface anatomy and cross-sectional anatomy.

Dissection, dissected specimens models, computer aided programs, x-rays and CT scans can be used.

**Head and Neck 12 weeks**

**Abdomen and Pelvis 12 weeks**

**Brain 8 weeks**

## **RECOMMENDED BOOKS**

1. **Gray's Anatomy** by Prof. Susan Standring 39<sup>th</sup> Ed., Elsevier.
2. **Clinical Anatomy for Medical Students** by Richard S.Snell.
3. **Clinically Oriented Anatomy** by Keith Moore.
4. **Clinical Anatomy** by R.J. Last, Latest Ed.
5. **Cunningham's Manual of Practical Anatomy** by G.J. Romanes, 15<sup>th</sup> Ed., Vol-I, II and III.
6. **The Developing Human. Clinically Oriented Embryology** by Keith L. Moore, 6<sup>th</sup> Ed.
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## Anatomy Department

### 1<sup>st</sup> year MBBS teaching Schedules

**Facilitators: Professor Dr. Mamoon Nasim**

**Recommended books:**

**1. Langman's Medical Embryology**

**2. Developing human By KL Moore**

1	Molecular regulation and cell signaling	Overview of <ul style="list-style-type: none"> <li>• Induction and organ formation</li> <li>• Cell signaling</li> <li>• Genomic imprinting</li> </ul>
2	Basic principles of genetics	The Laws and principals governing genetics
3	Oogenesis	<ul style="list-style-type: none"> <li>• Prenatal and postnatal maturation of oocyte</li> <li>• Significance of arrested development of oocyte</li> <li>• Hormonal control of oocyte maturation</li> </ul>
4	Spermatogenesis	<ul style="list-style-type: none"> <li>• Process of spermatogenesis and spermeiogenesis</li> <li>• Abnormal gametes</li> </ul>
5	Ovarian cycle and ovulation	<ul style="list-style-type: none"> <li>• Cyclic changes taking place in the uterus</li> <li>• Hormonal control of the cyclic changes and ovulation</li> </ul>
6	Fertilization	<ul style="list-style-type: none"> <li>• Conditioning of the male gamete in the female genital tract</li> <li>• Phases of fertilization</li> <li>• Results of fertilization</li> </ul>
7	Contraception and infertility	Brief overview of <ul style="list-style-type: none"> <li>• Methods of contraception</li> <li>• Male and female infertility</li> <li>• In-vitro fertilization</li> </ul>
8	Cleavage and blastocyst formation	<ul style="list-style-type: none"> <li>• Compaction</li> <li>• Formation of morula (division into inner and outer cell mass)</li> <li>• Blastocyst formation</li> </ul>
9	Implantation	<ul style="list-style-type: none"> <li>• Uterus at the time of implantation (decidua reaction)</li> <li>• Establishment of uteroplacental circulation</li> <li>• Differentiation of inner and outer cell mass</li> <li>• Abnormal implantation</li> <li>• Molar pregnancy</li> </ul>
10	Gastrulation	<ul style="list-style-type: none"> <li>• Formation of primitive streak</li> <li>• Invagination</li> <li>• Transformation of bilaminar germ disc into trilaminar germ disc</li> </ul>
11	Formation of notochord	<ul style="list-style-type: none"> <li>• Invagination and movement of prenotochordal cells</li> <li>• Notochordal plate formation</li> <li>• Neurenteric canal formation</li> <li>• Establishment of body axis</li> <li>• Fate map establishment</li> </ul>



12	Derivatives of ectoderm	<ul style="list-style-type: none"> <li>• Formation of neural tube from neural plate.</li> <li>• Derivatives of neural tube</li> <li>• Abnormalities in development of neural tube</li> <li>• Migration of neural crest cells</li> <li>• Derivatives of neural crest cells</li> </ul>
13	Germ layer derivatives 1 (Differentiation of mesoderm and derivatives of paraxial mesoderm)	<ul style="list-style-type: none"> <li>• Differentiation of mesoderm into its constituting components</li> <li>• Somite formation</li> <li>• Estimation of age by somites</li> <li>• Differentiation of somites</li> </ul>
14	Germ layer derivatives 2 (derivatives of mesoderm and endoderm)	<ul style="list-style-type: none"> <li>• Derivatives of intermediate and lateral plate mesoderm</li> <li>• Process of development of blood and blood vessels</li> <li>• Capillary hemangiomas</li> <li>• Derivatives of endoderm</li> </ul>
15	Folding of embryo	<ul style="list-style-type: none"> <li>• Cephalocaudal folding</li> <li>• Lateral folding</li> </ul>
16	Monthly changes in the development of fetus	<p>Overview of the</p> <ul style="list-style-type: none"> <li>• Monthly changes in External appearance</li> <li>• Growth in length and weight</li> <li>• IUGR</li> <li>• Estimation of age of fetus</li> </ul>
17	Fetal membranes and placenta 1	<ul style="list-style-type: none"> <li>• Changes in the trophoblast</li> <li>• Structure of placenta</li> <li>• Functions of placenta</li> <li>• Placental circulation</li> <li>• Placental barrier</li> </ul>
18	Fetal membranes and placenta 2	<ul style="list-style-type: none"> <li>• Umbilical cord</li> <li>• Cord abnormalities</li> <li>• Amniotic fluid</li> <li>• Polyhydramnios and oligohydramnios</li> </ul>
19	Twin pregnancy	<ul style="list-style-type: none"> <li>• Dizygotic twins</li> <li>• Monozygotic twins</li> <li>• Twin defects</li> </ul>
20	Birth defects	<ul style="list-style-type: none"> <li>• Types of abnormalities</li> <li>• Principles of teratology</li> <li>• Teratogens associated with human malformation</li> </ul>
21	Prenatal diagnosis and fetal therapy	<ul style="list-style-type: none"> <li>• Various methods of pre-natal diagnosis</li> <li>• Fetal therapy</li> </ul>

## Histology Schedule with Learning Objectives

### 1<sup>st</sup> Year MBBS (2018-2019)

<b>Week 1</b>	<b>Week 2</b>	<b>Week 3</b>
Cell membrane & Organelle	Cytoskeleton & cell junctions	Nucleus
<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Give structural details of cell membrane &amp; co-relate it with function.</li> <li>• Enumerate membrane bound &amp; non membranous organelles of cell.</li> <li>• Elaborate each organelle.</li> <li>• Use microscope efficiently.</li> <li>• Identify different types of artifacts.</li> <li>• Understand preparation of tissues with H &amp; E staining Techniques.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Provide an ample account of cytoskeletal elements.</li> <li>• Enumerate cell junctions.</li> <li>• Give structure of each junction.</li> <li>• Clinically co-relate abnormality of any cytoskeletal component as well as junction.</li> <li>• Identify different cell shapes (Squamous, cuboidal, columnar, round, polyhedral, fusiform, pyramidal &amp; multipolar) under light microscope.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Enumerate components of cell nucleus.</li> <li>• Provide structural detail of chromosomes.</li> <li>• Give an account of cell division (mitosis &amp; meiosis).</li> <li>• Identify different cell shapes (Squamous, cuboidal, columnar, round, polyhedral, fusiform, pyramidal &amp; multipolar) under light microscope.</li> </ul>
<b>Week 4 28-30 Jan, 2019</b>	<b>Week 5 04-06 Feb, 2019</b>	<b>Week 6 18-20 Feb, 2019</b>
Epithelium	Epithelium	Connective Tissue

<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Classify surface epithelia e.g. simple (Squamous, cuboidal, columnar &amp; pseudostratified) and stratified (st. Squamous, st. cuboidal, st. columnar &amp; transitional) as well as glandular epithelia with examples of their locations in human body.</li> <li>• Give structural &amp; functional characteristics of epithelial tissue.</li> <li>• Identify different types of epithelia under light microscope and will draw simple epithelia.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Explain structural polarity of epithelial cells with its surface modifications and their participation in their functioning.</li> <li>• Identify clinical problems related to epithelia and their associated structures.</li> <li>• Identify different types of epithelia under light microscope and will draw stratified epithelia.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Reproduce the structural components &amp; functional characteristics of connective tissue.</li> <li>• Classify various types of connective tissue (embryonic and adult) with examples of their location in our body.</li> <li>• Identify connective tissue under light microscope and will differentiate from one another and will draw them.</li> </ul>
<p><b>Week 7 25-27 Feb, 2019</b></p> <p>Connective Tissue</p>	<p><b>Week 8 04-06 March, 2019</b></p> <p>Cartilage (Special C. T.)</p>	<p><b>Week 9 11-13 March, 2019</b></p> <p>Bone (Special C. T.)</p>
<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Give the biochemical composition of extracellular matrix components.</li> <li>• Co-relate the clinical problems faced in case of change in any of the components of connective tissue.</li> <li>• Identify connective tissue components under light microscope stained with special stains and can draw them correctly.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Define &amp; classify cartilage as special connective tissue with locations of different types in our body.</li> <li>• Give structural composition of different types of cartilage.</li> <li>• Reproduce the structural similarities and differences among three types of cartilage.</li> <li>• Identify under light microscope and draw different cartilages (hyaline, articular, elastic &amp; fibrous).</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Define the bone as specialized connective tissue and enlist its components (cells, fibers &amp; ground substance).</li> <li>• Classify different bone types with examples of their location in human body.</li> <li>• Give general arrangement of component parts in both types of bone (periosteum, haversian system etc.).</li> <li>• Identify all of the above mentioned components in slides of compact bone under light microscope.</li> <li>• Draw microscopic structure of compact bone</li> </ul>

<b>Week 10 18-20 March, 2019</b>	<b>Week 11 08-10 April, 2019</b>	<b>Week 12</b>
Muscle Tissue	Nervous Tissue	Nervous system
<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Enlist three types of muscle tissue with their locations in our body.</li> <li>• Reproduce structure of skeletal muscles in detail &amp; the role of T-tubules and sarcoplasmic reticulum in functioning of striated muscles.</li> <li>• Identify longitudinal &amp; horizontal sections of skeletal muscles under light microscope.</li> <li>• Draw L.S. &amp; C. S. of skeletal muscles.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Enlist the structural components of nervous tissue.</li> <li>• Classify neurons &amp; neuroglia (central &amp; peripheral nervous system).</li> <li>• Elaborate the structure of peripheral nerve.</li> <li>• Identify L. S. &amp; C. S. of peripheral nerve under light microscope.</li> <li>• Draw section of peripheral nerve with component details.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Give the histological structure of spinal cord with components of grey and white matter.</li> <li>• Identify section of spinal cord under light microscope &amp; draw its microscopic picture.</li> </ul>
<b>Week 13 25-27 March, 2019</b>	<b>Week 14 29,30 April 2019</b>	<b>Week 15 6-8 May 2019</b>
Vascular System	Lymphoid System(Introduction & Thymus)	Lymphoid System (Lymph node)
<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Classify different components of circulatory system structurally &amp; functionally.</li> <li>• Provide structural components of three layers (tunics) that form the walls of blood vessels.</li> <li>• Give changes in architecture of elastic, muscular arteries, arterioles and capillaries.</li> <li>• Identify different types of arteries under light microscope, &amp; draw histologic picture of these vessels.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Enumerate the names, locations &amp; function of cells, tissues &amp; organs constitute the lymphoid system.</li> <li>• Give the distinguishing criteria of lymphoid organs &amp; the differences between central &amp; peripheral lymphoid organs.</li> <li>• Elaborate the central nature &amp; significance of thymus.</li> <li>• Give the structural differences of thymus from other peripheral lymphoid</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>• Elaborate structural details of lymph node.</li> <li>• Co-relate Clinical involvement of lymph node in immune response.</li> <li>• Identify lymph node under light microscope &amp; draw its histological picture.</li> </ul>

	<p>organs.</p> <ul style="list-style-type: none"> <li>Identify thymus under light microscope &amp; draw its histological picture.</li> </ul>	
<p><b>Week 16 13-15 May 2019</b></p> <p><b>Week 17 20-22 May 2019</b></p> <p>Lymphoid System (Tonsil &amp; Spleen)</p>	<p><b>Week 18 15-17 April, 2019</b></p> <p>Integumentary System(thick skin)</p>	<p><b>Week 19 22-24 April, 2019</b></p> <p>Integumentary System (thin skin)</p>
<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>Give structural details and the arrangement of lymphoid follicles in tonsil &amp; spleen.</li> <li>To compare &amp; contrast different lymphoid organs.</li> <li>Identify palatine tonsil and spleen under light microscope &amp; draw their histological picture.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>Enumerate cells and cell layers present in both types of skin (thick &amp; thin).</li> <li>Provide a comprehensive account of skin layers (epidermis, dermis and hypodermis).</li> <li>Identify thick skin under light microscope &amp; draw its histological picture.</li> </ul>	<p>At the end of session the student will be able to</p> <ul style="list-style-type: none"> <li>Give structural details of thin skin, with its appendages(hair, nail &amp; glands).</li> <li>Co-relate various clinical conditions (psoriasis, albinism, vitiligo, blistering disorders and carcinoma) with structure</li> <li>Identify thin skin under light microscope &amp; draw its histological picture.</li> </ul>
<p><b>Week 20 27-29 May 2019</b></p> <p><b>Respiratory system (Trachea, Epiglottis)</b></p>	<p><b>Week 21 3-5 June 2019</b></p> <p><b>Respiratory system (Lungs)</b></p>	<p><b>Week 22 10-12 June 2019</b></p> <p>Different phases of mammary glands</p>

### **Anatomy Department**

#### **Thorax**

#### **Learning objectives**

#### **After the completion of the region the students will be able to**

1. Identify and draw different parts of thoracic vertebrae, sternum and ribs with their attachments and relations.
2. Distinguish between typical and atypical thoracic vertebrae, ribs. Highlight the characteristic features differencing between thoracic, cervical and lumbar vertebrae
3. Demonstrate, identify and explain the structures contributing to the formation of thoracic wall.

4. Enlist the various joints of thoracic wall with their types, ligaments and role in movement of the thoracic wall.
5. Explain and identify the course, relations, branches and distribution of nerves and vessels of thoracic wall.
6. Enlist the various clinico-pathological conditions of thoracic wall with their presentations and anatomical justifications
7. Demonstrate and discuss attachments, nerve supply, blood supply and role in respiratory movements of diaphragm and thoracic wall musculature.
8. Explain the movements of the thoracic wall (bucket-handle & pump handle)
9. Discuss the boundaries and contents of thoracic inlet and outlet
10. Explain and identify the boundaries, divisions and contents of mediastinum with related clinical conditions
11. Identify and explain the relations, characteristic features, surface anatomy and clinical conditions of the structures/ contents of the mediastinum
12. Discuss and identify the features, relations, surface anatomy and neurovascular supply of pleura and lungs.
13. Explain the anatomy of broncho-pulmonary segments with their clinical significance.
14. Discuss and identify the features, relations, surface anatomy and neurovascular supply of pericardium
15. Demonstrate and explain the formation and clinical significance of Pericardial sinuses.
16. Discuss and identify Heart with the internal and external features, chambers, valves, conducting system, nerve supply, blood supply and surface anatomy
17. Justify anatomically the presenting complaints encountered in important clinical conditions such as hydropneumothorax, pleurisy, foreign body inhalation, hemidiaphragm, flail chest, referred pain etc
18. Explain procedures such as thoracocentesis, chest tube intubation, intercostals nerve block anatomically.
19. Explain the lymph drainage of thoracic wall and viscera in order to find sites of metastasis
20. Discuss and draw the dermatomes, venous drainage of thorax
21. Differentiate the and identify the various structures seen in radiographs

## **Anatomy Department**

### **Upper Limb**

#### **Learning objectives**

#### **After the completion of the region the students will be able to**

1. Identify, draw, demonstrate and discuss the characteristic features, attachments, relations, ossification of the bones of the upper limb (clavicle, scapula, humerus, radius, ulna, and bones of hand).
2. Discuss and anatomically justify the presentation of various upper limb fractures encountered.
3. Discuss and identify the structure, relations, nerve supply, blood supply lymphatic drainage of Breast with special emphasis on the anatomical justification of presentation and metastasis of carcinoma breast.
4. Discuss and identify the attachments, relations, nerve supply, blood supply and actions of the muscles of pectoral, and scapular regions.
5. Identify and discuss the course, relation and distribution of the nerves and vessels in the pectoral and scapular region to detect the effects of injury.
6. Discuss the movements of the scapula with the role of muscles contributing to these movements
7. Identify and explain the relations, characteristic features, surface anatomy and clinical conditions of the structures/ contents of the Axilla
8. Identify and discuss the various groups of lymph nodes of upper limb with their afferent and efferent vessels
9. Identify and discuss the course, relation and distribution of the vessels in the axilla
10. Discuss the Course, relation, branches, distribution and areas for pulsations of the major arteries of upper limb (axillary, profunda brachii, brachial, radial and ulnar)
11. Discuss, draw and identify the formation, relations branches and distribution of brachial plexus.
12. Justify anatomically the presenting complaints encountered in brachial plexus injuries and nerve lesions of upper limb
13. Discuss and identify the attachments, relations, nerve supply, blood supply and actions of the muscles of anterior and posterior compartments of the arm.
14. Discuss and identify the attachments, relations, nerve supply, blood supply and actions of the muscles of flexor and extensor muscles of the hand and fingers with their attachment and arterial and nerve supply.
15. Identify and discuss the course, relation and distribution of the nerves and vessels in the arm, forearm and hand to detect the effects of nerve injury.
16. Discuss the formation, relations, branches and distribution of superficial and deep palmar arches
17. Draw and explain the Cutaneous innervations of the hand
18. Identify, discuss and demonstrate the structure, mechanics, principals and movement of the joints of the upper limb.

19. Identify and discuss the sites of arterial anastomosis and the clinical significance of these anastomosis.
20. Discuss the mechanism of gripping
21. Differentiate and identify the various structures seen in radiographs.

### ***Anatomy Department***

#### ***Lower Limb***

#### ***Learning objectives***

#### ***After the completion of the region the students will be able to***

1. Identify, draw, demonstrate and discuss the characteristic features, attachments, relations, ossification of the bones of the lower limb (Hip bone, femur, tibia, fibula and bones of foot).
2. Discuss and anatomically justify the presentation of various lower limb fractures
3. Demonstrate and explain the attachments and clinical significance of the deep fascia of thigh
4. Identify and discuss the various groups of lymph nodes of lower limb with their afferent and efferent vessels
5. Identify and discuss the surface anatomy, course, relations, tributaries and communications of the superficial and deep veins of the lower limb
6. Anatomically justify the clinico-pathological conditions associated with the superficial and deep veins of lower limb
7. Discuss and identify the attachments, relations, nerve supply, blood supply and actions of the muscles of anterior, posterior and medial compartments of the thigh.
8. Identify and describe the boundaries and contents of the femoral triangle, adductor canal and popliteal fossa
9. Identify and explain the relations, characteristic features, surface anatomy and clinical conditions of the structures/ contents of the femoral triangle, adductor canal and popliteal fossa
10. Discuss the Course, relation, branches, distribution and areas for pulsations of the major arteries of lower limb (femoral, popliteal, anterior& posterior tibial, dorsalis)
11. Discuss and identify the attachments, relations, nerve supply, blood supply and actions of the muscles of gluteal region.
12. Identify and discuss the course, relation and distribution of the nerves and vessels in the gluteal region.
13. Discuss and identify the attachments, relations, nerve supply, blood supply and actions of the muscles of flexor and extensor compartment of the leg
14. Identify and discuss the course, relation and distribution of the nerves and vessels in the thigh, leg and foot to detect the effects of nerve injury.
15. Anatomically justify the presenting complaints seen in various nerve (superior and inferior gluteal, femoral, obturator, sciatic, superficial and deep peroneal, tibial, medial and lateral planter) lesions of lower limb



16. Discuss the formation, relations, branches and distribution of planter arterial arch
17. Discuss the formation, relations, and mechanics of the arches (longitudinal and transverse) of foot
18. Discuss the mechanics and principals of walking.
19. Discuss and identify the attachments, relations, nerve supply, blood supply and actions of the muscles of sole of feet
20. Draw and explain the Cutaneous innervations and dermatomes of the lower limb
21. Identify, discuss and demonstrate the structure, mechanics, principals and movement of the joints of the lower limb.
22. Identify and discuss the sites of arterial anastomosis and the clinical significance of these anastomosis.
23. Differentiate and identify the various structures seen in radiographs.

## THORAX

Week 1 Learning Objectives	Week 2 Learning Objectives	Week 3 Learning Objectives
<p>At the end of the week, the student will be able to demonstrate.</p> <ul style="list-style-type: none"> <li>• Parts of <b>Sternum</b>, joints formed with their type, attachments, important relations and ossifications.</li> <li>• Sternal puncture and shapes of chest.</li> <li>• Parts of <b>Ribs</b>, joints formed with their type, attachments, important relations and ossifications.</li> <li>• Flail chest and Thoracotomy.</li> </ul> <p><b>(29-3-19 -- 5-4-19)</b></p>	<p>At the end of the week, the student will be able to demonstrate/ write</p> <ul style="list-style-type: none"> <li>• Demonstrate parts of <b>Thoracic vertebrae</b>, joints formed with their type, attachments, important relations and ossifications.</li> <li>• Intervertebral disc and herniation. Differences between thoracic, cervical and lumbar vertebrae</li> <li>• Muscles of <b>intercostals space</b>, proximal and distal attachments, innervation and actions. Supra pleural membrane</li> </ul> <p><b>(8-4-19 -- 12-4-19)</b></p>	<p>At the end of the week, the student will be able to demonstrate/ write</p> <ul style="list-style-type: none"> <li>• Course, relations, branches and distribution of typical and atypical <b>intercostals nerve</b>.</li> <li>• Course, relations, branches and distribution of typical and atypical <b>intercostals artery</b>.</li> <li>• Course, relations, branches and distribution of <b>internal thoracic artery</b>.</li> <li>• <b>Diaphragm</b> with attachments, sensory &amp; motor innervation, blood supply and lymphatic drainage.</li> <li>• Structure traversing and actions of diaphragm.</li> <li>• Diaphragmatic hernia and referred pain.</li> </ul> <p><b>(15-4-19 -- 19-4-19)</b></p>
<p><b>Teaching methodologies</b> SGD/ PBL/Presentation</p>	<p><b>Teaching methodologies</b> SGD/ PBL/Presentation</p>	<p><b>Teaching methodologies</b> SGD/ PBL/Presentation</p>
<p><b>Substage 1- Assessment (Formative) 1<sup>st</sup> S/S – 22.04.2019</b> <b>Viva/ OSPE/ SEQ/ MCQ</b></p>		
<p><b>Week 4 Learning Objectives 23-26 April 2019</b></p>	<p><b>Week 5 Learning Objectives 29 April - 3<sup>rd</sup> May 2019</b></p>	<p><b>Week 6 Learning Objectives 6<sup>th</sup> – 10<sup>th</sup> May 2019</b></p>
<p>At the end of the week, the student will be able to demonstrate/ write</p> <ul style="list-style-type: none"> <li>• <b>Types of respiration</b>, muscles responsible.</li> <li>• Changes in various diameters of thoracic cavity during inspiration and expiration</li> <li>• Division of <b>mediastinum</b>.</li> </ul>	<p>At the end of the week, the student will be able to demonstrate/ write</p> <ul style="list-style-type: none"> <li>• Boundaries and contents of <b>middle mediastinum</b></li> <li>• Types of <b>pericardium</b> with its blood supply and nerve supply. Pericarditis, pericardial drainage.</li> </ul>	<p>At the end of the week, the student will be able to demonstrate/ write</p> <ul style="list-style-type: none"> <li>• Boundaries and contents of <b>posterior mediastinum</b></li> <li>• Esophagus course, relations, constrictions, blood, nerve supply and lymphatics.</li> <li>• Thoracic duct. Formation</li> </ul>

<ul style="list-style-type: none"> <li>• Boundaries and contents of <b>superior mediastinum</b> (Trachea, esophagus, Phrenic and vagus nerves, Thymus, Subclavian brachiocephalic and common carotid vessels</li> <li>• Trachea, structure blood supply, nerve supply and lymphatics.Tracheotomy.</li> <li>• Phrenic and vagus nerve, their course relations and branches.</li> </ul> <p>Thymus, structure, blood supply and lymphatics.</p>	<ul style="list-style-type: none"> <li>• Topography of <b>Heart</b>.</li> <li>• Gross features of heart</li> <li>• Fibrous skeleton.</li> <li>• Characteristic features of the four chambers of heart.</li> <li>• Characteristic features of the valves with their surface marking.</li> <li>• Nerve supply, blood supply and lymphatics of heart.</li> <li>• Myocardial infarction.andAngina.</li> </ul>	<p>course relations, area of drainage and its termination</p> <ul style="list-style-type: none"> <li>• Azygous, hemizygous, accessory hemizygous veins with their course, formation and tributaries.</li> <li>• Sympathetic chain. Course, relations and branches. Sympathectomy.</li> <li>• Raynauds syndrome.</li> </ul>
<p><b>Teaching methodologies</b> SGD/ PBL/Presentation</p>	<p><b>Teaching methodologies</b> SGD/ PBL/Presentation</p>	<p><b>Teaching methodologies</b> SGD/ PBL/Presentation</p>
<p align="center"><b>Substage 2- Assessment (Formative) 2<sup>nd</sup> S/S – 13.06.2019</b> <b>Viva/ OSPE/ SEQ/ MCQ</b></p>		
<p><b>Week 7 Learning Objectives</b></p>	<p><b>Week 8</b></p>	
<p>At the end of the week, the student will be able to demonstrate/ write</p> <ul style="list-style-type: none"> <li>• Structure, blood supply, nerve supply and lymphatics of <b>pleura</b>.</li> <li>• Dead space.and Pleurisy</li> <li>• Pleural aspiration</li> <li>• Structure of <b>Lung</b> and broncho-plummonary segments.Blood supply, nerve supply and lymphatics.</li> <li>• Demonstrate radiology of thorax</li> <li>• Demostrate surface marking of thorax</li> </ul>	<p><b>Final Stage =24.06.2019</b></p> <p><b>Modes of Assessment (Summative)</b></p> <p><b>SEQs/ MCQs/ OSPE/ VIVA</b></p>	
<p><b>Teaching methodologies</b> SGD/ PBL/Presentation</p>		

## UPPER LIMB

Week 1 (7-1-2019 to 11-1-2019 ) Learning Objectives	Week 2 (14-1-2019 to 18-1-2019 ) Learning Objectives	Week 3 (21-1-2019 to 23-1-2019 ) Learning Objectives
<p>At the end of the week, the student will be able to demonstrate</p> <ul style="list-style-type: none"> <li>• Parts of the <b>clavicle</b>, with its attachments, important relations, joints formed with it, ossification, side determination, fractures and sex differences.</li> <li>• Parts of <b>scapula</b> with its attachments, important relations, and joints formed with it, ossification, side determination, fractures and sex differences.</li> <li>• Parts of <b>humerus</b> with its attachments, important relation, joints formed with it, ossification, side determination, fractures and sex differences.</li> </ul>	<p>At the end of the week, the student will be able to demonstrate/ write</p> <ul style="list-style-type: none"> <li>• Muscles of <b>pectoral girdle</b>, their proximal &amp; distal attachments, nerve supply and actions.</li> <li>• Clavipectoral fascia, attachments and structure traversing.</li> <li>• Joints of pectoral girdle with their type, stability, movements.</li> <li>• Muscles of <b>scapular region</b>, proximal &amp; distal attachments, innervation and actions.</li> <li>• Draw Scapular anastomosis and its importance.</li> <li>• <b>Shoulder joint</b> with its type, articulations, important relations, Stability, movements and muscles responsible (rotator cuff), neurovascular supply and Dislocation.</li> </ul>	<p>At the end of the week, the student will be able to demonstrate/ write</p> <ul style="list-style-type: none"> <li>• Boundaries and contents of <b>Axilla</b>.</li> <li>• Axillary vessels, their course, relations and branches.</li> <li>• Draw brachial plexus, its formation, relations, branches and injuries (Erb's paralysis, Klumpke's paralysis)</li> <li>• Lymph nodes of Axilla and their area of drainage</li> <li>• <b>Breast</b> with its Location, structure, blood supply, nerve supply and lymphatic drainage.</li> <li>• Applied aspects (CA breast, mastitis and mastectomy)</li> </ul>
Teaching methodologies	Teaching methodologies	Teaching methodologies

SGD/ PBL/Presentation	SGD/ PBL/Presentation	SGD/ PBL/Presentation
<b>Substage 1- Assessment (Formative) S/S 1 = 24<sup>th</sup> January, 2019</b> <b>Viva/ OSPE/ SEQ/ MCQ</b>		
<b>Week 4</b> <b>(28-1-2019 to 1-2-2019 )</b> <b>Learning Objectives</b>	<b>Week 5</b> <b>(4-2-2019 to 7-2-2019 )</b> <b>Learning Objectives</b>	<b>Week 6</b> <b>(8, 11-2-2019 to 15-2-2019 )</b> <b>Learning Objectives</b>
<p>At the end of the week, the student will be able to demonstrate/ write</p> <ul style="list-style-type: none"> <li>• <b>Anterior compartment of arm</b> with Inter-muscular septum and muscles with their proximal and distal attachments, innervation and actions.</li> <li>• Course, relations and branches of brachial artery.</li> <li>• Course, relations and branches of musculocutaneous nerve.</li> <li>• Draw boundaries and contents of <b> cubital fossa</b>.</li> <li>• <b>Posterior compartment of arm</b> with its muscles along with their proximal and distal attachments, innervation and actions.</li> <li>• Course, relations and branches of profunda brachii artery.</li> <li>• Course, relations and branches of radial nerve.</li> </ul>	<p>At the end of the week, the student will be able to demonstrate/ write.</p> <ul style="list-style-type: none"> <li>• <b>Elbow joint</b> with its type , its articular surfaces and important relations.</li> <li>• Stability, movements and muscles responsible.</li> <li>• Draw Blood supply of elbow joint , write nerve supply.and Carrying angle</li> <li>• Parts of <b>Radius and Ulna</b>, joints formed with their type attachments.Important relations. Ossifications and fractures</li> <li>• <b>Radioulnar joints</b> with their type , articular surfaces and important relations.Stability, movements and muscles responsible</li> </ul>	<p>At the end of the week, the student will be able to demonstrate/ write.</p> <ul style="list-style-type: none"> <li>• <b>Anterior compartment of forearm</b> with its muscles, their proximal and distal attachments, innervation and actions.</li> <li>• Course, relations, branches of radial and ulnar artery.</li> <li>• Course, relations, branches of median and ulnar nerve.</li> <li>• Type of <b>wrist joint</b>, its articular surfaces and important relations.</li> <li>• Stability, movements and muscles responsible.</li> <li>• Blood supply and nerve supply.</li> <li>• Bones participating and joints formed in <b>articulated hand</b></li> </ul>
<b>Teaching methodologies</b> <b>SGD/ PBL/Presentation</b>	<b>Teaching methodologies</b> <b>SGD/ PBL/Presentation</b>	<b>Teaching methodologies</b> <b>SGD/ PBL/Presentation</b>
<b>Substage 2- Assessment (Formative) S/S 2 = 7<sup>th</sup> February, 2019</b> <b>Viva/ OSPE/ SEQ/ MCQ</b>		
<b>Week 7</b> <b>(18-2-2019 to 22-2-2019 )</b> <b>Learning Objectives</b>	<b>Week 8</b> <b>(25-2-2019 to 28-2-2019 )</b> <b>Learning Objectives</b>	
<p>At the end of the week, the student will be able to demonstrate/ write</p>	<p>At the end of the week, the student will be able to demonstrate/ write</p>	<p>At the end of the week, the student will be able to demonstrate/ write</p>

<ul style="list-style-type: none"> <li>Palmer aponeurosis. Flexor retinaculum, its attachments and relations.</li> <li>Carpal tunnel formation. Carpal tunnel syndrome</li> <li>Draw course, relations, branches of Superficial and deep palmar arches.</li> <li>Course, relations, branches of digital nerves.</li> </ul>	<ul style="list-style-type: none"> <li>Muscles (Lumbrical, interossei, thenar and hypothenar) with their proximal and distal attachments, innervation and actions.</li> <li>Gripping mechanism of hand</li> <li>1<sup>st</sup> carpometacarpal joint, its articular surfaces and important relations. Stability, movements and muscles responsible</li> <li>Palmer and web spaces along with their clinical importance.</li> </ul>	<ul style="list-style-type: none"> <li>Extensor compartment of forearm Muscles with their proximal and distal attachments, innervation and actions.</li> <li>Course, relations, branches of posterior interosseous artery.</li> <li>Course, relations, branches of radial nerve.</li> <li>Dorsal digital expansion its formation and importance.</li> <li>Extensor retinaculum, its attachments and structure passing through it.</li> </ul>
<b>Teaching methodologies</b> SGD/ PBL/Presentation	<b>Teaching methodologies</b> SGD/ PBL/Presentation	<b>Teaching methodologies</b> SGD/ PBL/Presentation
<b>Sub stage 3- Assessment (Formative) S/S 3 = 4<sup>th</sup> March, 2019</b>  <b>Viva/ OSPE/ SEQ/ MCQ</b>		
<b>Week 09</b>  <b>(5-3-2019 to 8-3-2019 )</b>  <b>Learning Objectives</b>	<b>Week 10</b>  <b>(11-3-2019 to 15-3-2019 )</b>  <b>Learning Objectives</b>	<b>Week 11</b>  <b>(18-3-2019 to 22-3-2019 )</b>
At the end of the week, the student will be able to Draw/ demonstrate/ write <ul style="list-style-type: none"> <li>Course, relations, tributaries of cephalic, basilic and median cubital veins.</li> <li>Cutaneous Innervation and dermatomes of upper limb.</li> </ul>	At the end of the week, the student will be able to demonstrate <ul style="list-style-type: none"> <li>Radiology of upper limb</li> <li>Surface marking of upper limb</li> </ul>	<b>Final Stage = 25,27-3-2019</b>  <b>Modes of Assessment</b>  <b>(Summative)</b>  <b>SEQs/ Macs/ OSPE/ VIVA</b>
<b>Teaching methodologies</b> SGD/ PBL/Presentation	<b>Teaching methodologies</b> SGD/ PBL/Presentation	

## **Learning Objectives**

### **Histology**

**2<sup>nd</sup> year MBBS**

**Facilitators; Professor Dr. Mamoon Naheed**

#### **Recommended Books:**

- **Basic Histology Junqueira 12<sup>th</sup> edition**
- **Functional Histology Wheater's**
- **diFlore's Atlas of Histology**

Date	Lecture	objectives	Practicals
21-11-18 22-11-18	Respiratory system  Nasal cavity, paranasal air sinuses, nasopharynx, larynx & epiglottis.	<ul style="list-style-type: none"> <li>• Introduction to respiratory system, including conduction respiratory parts.</li> <li>• Microscopic structure of walls of nasal cavity &amp; nasopharynx.</li> <li>• Structure of olfactory epithelium.</li> <li>• Ultra-microscopic structure &amp; types of cells forming respiratory epithelium.</li> <li>• Components &amp; layers forming wall of larynx.</li> <li>• Transition of epithelium with its functional correlation.</li> </ul>	Larynx & Epiglottis
28-11-18	Trachea	<ul style="list-style-type: none"> <li>• Microscopic structure of wall of trachea with components forming mucosa, submucosa, cartilage and adventitia.</li> <li>• Changes in microscopic structure of bronchial tree as we go down the conducting passages, till alveoli of respiratory passages.</li> </ul>	Trachea
29-11-18	Lung	<ul style="list-style-type: none"> <li>• Microscopic structure of lung with different cell types present.</li> <li>• Blood air barrier.</li> <li>• Clinical conditions e.g. immotile cilia syndrome, histological basis of asthma, cancer.</li> </ul>	Lung
5-12-18 6-12-18	GIT & Associated Glands  Lip, vestibule, Oral cavity, palate.	<ul style="list-style-type: none"> <li>• Introduction to various parts of gastrointestinal tube.</li> <li>• Elaboration of components forming different layers of lip structure, including mucosa covering internal part, red zone &amp; cutaneous surface covered by skin. Central layer of skeletal muscle.</li> </ul>	Lip
12-12-18		<ul style="list-style-type: none"> <li>• Monthly test – 1</li> </ul>	
12-12-18	Tongue & structure of taste buds.	<ul style="list-style-type: none"> <li>• Structure of tongue, various types of papillae with their structure &amp; location.</li> <li>• Microscopic anatomy of taste buds with their location &amp; functional correlation.</li> </ul>	Tongue



13-12-18	Pharynx & oesophagus	<ul style="list-style-type: none"> <li>• General constitution of gastrointestinal tube, with components of four layers.</li> <li>• Structure of pharynx.</li> <li>• Histological structure of oesophagus with differences in upper, middle &amp; lower parts.</li> </ul>	Oesophagus
19-12-18	Stomach	<ul style="list-style-type: none"> <li>• Microscopic structure of four layers of stomach.</li> <li>• Regional differences between different regions including cardia, fundus &amp; body and pylorus.</li> <li>• Parts &amp; Ultramicroscopic structure of gastric glands</li> <li>• Structure of Cardioesophageal &amp; gastroduodenal junctions.</li> <li>• Clinical condition reflux esophagitis.</li> </ul>	Stomach
20-12-18	Small intestine	<ul style="list-style-type: none"> <li>• Histological structure of different layers of small intestine.</li> <li>• Regional differences between three parts.</li> <li>• Structure of peyer's patch with their clinical significance.</li> </ul>	Duodenum Jejunum & Ileum.
2-1-18	Large intestine	<ul style="list-style-type: none"> <li>• Histological structure of different layers of large intestine.</li> <li>• Microscopic structure of appendix.</li> </ul>	Colon & appendix
3-1-19	Rectum	<ul style="list-style-type: none"> <li>• Special features of all four layers of rectum.</li> <li>• Distinguishing features from pylorus of stomach.</li> </ul>	Rectum
9-1-19		<ul style="list-style-type: none"> <li>• Monthly test -2</li> </ul>	
9-1-19	Anal canal	<ul style="list-style-type: none"> <li>• Changes of epithelium at junctions.</li> <li>• Specialized features that differentiate anal canal from esophagus.</li> </ul>	Anal canal
10-1-19	Salivary glands	<ul style="list-style-type: none"> <li>• Histological structure of serous &amp; mucous acini.</li> <li>• Structure of parotid, sub-mandibular &amp; sub-lingual salivary glands.</li> <li>• Salient features that compare &amp; contrast them.</li> </ul>	Parotid, submandibular & sublingual glands

16-1-19	Liver & gallbladder	<ul style="list-style-type: none"> <li>• Division of liver parenchyma into different lobules with their clinical significance.</li> <li>• Histological structure of liver.</li> <li>• Microscopic anatomy of gall bladder.</li> </ul>	Liver & gall bladder
17-1-19	Pancreas	<ul style="list-style-type: none"> <li>• Microscopic structure of exocrine pancreas.</li> <li>• Distinguishing features of exocrine pancreas from salivary glands.</li> <li>• Histology of endocrine pancreas.</li> </ul>	Exocrine & endocrine pancreas
23-1-19	Pituitary gland	<ul style="list-style-type: none"> <li>• Microscopic anatomy of pituitary gland with its embryological background.</li> </ul>	Pituitary gland
24-1-19	Thyroid & parathyroid gland	<ul style="list-style-type: none"> <li>• Histological structure of thyroid gland with its functional correlation.</li> <li>• Microscopic picture of parathyroid gland.</li> </ul>	Thyroid & parathyroid gland.
30-1-19	Adrenal gland	<ul style="list-style-type: none"> <li>• Histological structure of adrenal gland with specifying three layers of cortex.</li> <li>• Distinguishing features of cortex from medulla.</li> </ul>	Adrenal gland
31-1-19	Urinary system Kidney	<ul style="list-style-type: none"> <li>• Microscopic anatomy of kidney.</li> <li>• Arrangement of different parts of nephron &amp; collecting ducts in cortex &amp; medulla.</li> <li>• Components of filtration barrier.</li> <li>• Parts of juxtaglomerular apparatus with their functional correlation &amp; clinical significance.</li> </ul>	Kidney
6-2-19	Ureter & urinary bladder	<ul style="list-style-type: none"> <li>• Microscopic &amp; ultramicroscopic structure of urothelium.</li> <li>• Histology of ureteric wall.</li> <li>• Microanatomy of urinary bladder.</li> </ul>	Ureter & urinary bladder
7-2-19	Urethra	<ul style="list-style-type: none"> <li>• Epithelial lining of male &amp; female urethra.</li> <li>• Histological structure of male urethra. Its differences from female urethra.</li> </ul>	Male urethra
13-2-19		<ul style="list-style-type: none"> <li>• Term test -1</li> </ul>	
13-2-19	Male Reproductive System	<ul style="list-style-type: none"> <li>• Structure of testis.</li> <li>• Ultra-structure of germinal epithelium.</li> <li>• Blood testis barrier.</li> </ul>	Testis

	Testis		
14-2-19	Epididymus & vas deferens	<ul style="list-style-type: none"> <li>• Histological structure of Epididymus &amp; vas deferens.</li> <li>• Ultra-microscopic structure of lining epithelium.</li> </ul>	Epididymus & vas deferens
20-2-19	Seminal vesicles	<ul style="list-style-type: none"> <li>• Microscopic anatomy of seminal vesicles with functional correlation.</li> </ul>	Seminal vesicles
21-2-19	Prostate gland	<ul style="list-style-type: none"> <li>• Histology of prostate gland.</li> <li>• Age estimation under microscope.</li> </ul>	Prostate gland
27-2-19	Female reproductive system  Ovary	<ul style="list-style-type: none"> <li>• Structure of ovary.</li> <li>• Microscopic structure of different ovarian follicles.</li> </ul>	Ovary
28-2-19	Fallopian tube	<ul style="list-style-type: none"> <li>• Histological structure of wall of fallopian tube (oviduct).</li> <li>• Ultra-microscopic picture of lining epithelium.</li> </ul>	Fallopian tube
6-3-19	Uterus	<ul style="list-style-type: none"> <li>• Microscopic picture of uterus.</li> <li>• Menstrual cycle related changes in histology of endometrium.</li> </ul>	Uterus three phases (menstrual, Proliferative & secretory).
7-3-19	Cervix & vagina	<ul style="list-style-type: none"> <li>• Structure of cervix &amp; vagina.</li> <li>• Change of epithelium at internal os.</li> </ul>	Cervix & vagina
13-3-19		<ul style="list-style-type: none"> <li>• Monthly test -3</li> </ul>	
13-3-19	Mammary gland	<ul style="list-style-type: none"> <li>• Microscopic picture of mammary gland.</li> <li>• Age related changes in histology of gland.</li> <li>• Microscopic differences in parenchyma &amp; stroma in active &amp; inactive glands.</li> <li>• Anatomical basis of clinical conditions like cancer.</li> </ul>	Mammary gland (Active & inactive)

14-3-19	Special senses  Eye lid, conjunctiva, cornea, sclera and choroids coat.	<ul style="list-style-type: none"> <li>• Structure of eyelid, conjunctiva, cornea &amp; sclera.</li> <li>• Functional correlation of each part with its histology.</li> </ul>	Special senses  Eye lid, conjunctiva, cornea, sclera and choroid.
20-3-19	Retina	<ul style="list-style-type: none"> <li>• Two layers of retina, ultra structure of retinal layers.</li> <li>• Clinical anatomy of detachment of retina.</li> </ul>	Retina
21-3-19	Internal ear	<ul style="list-style-type: none"> <li>• Microscopic structure of organ of corti, with different types of cells.</li> </ul>	Internal ear
22-7-2019 23-7-2019 23-7-2019	<b>Test 2</b>  <b>Histology OSPE</b>		

## Learning Objectives

# Gross Anatomy

## Region: Special Embryology

### 2<sup>nd</sup> year MBBS

Facilitators; Professor Dr. Mamoona Naheed, Dr. Faeza

#### Recommended Books:

- The developing Human clinically oriented Embryology Keith. L. Moore
- Langman's Medical Embryology T.W. Sadler 10<sup>th</sup> edition

S.No.	Date	Topic	Learning objectives  At the end of each Lecture the student will be able to Draw/ demonstrate/ write
	1-1-19	<b>Development of the skull</b> <b>Development of vertebral column, ribs and sternum</b>	<ul style="list-style-type: none"><li>• Factors contributing in the development of skeletal system</li><li>• Overview of methods of ossification</li><li>• Formation of neurocranium and viscerocranium and their derivatives</li><li>• Cranio-facial defects and skeletal dysplasias</li><li>• Development of vertebral column and vertebrae</li><li>• Overview of the defects of vertebral column</li><li>• Development of ribs and sternum</li></ul>
	7-1-19	<b>Development of pharyngeal arches</b>	<ul style="list-style-type: none"><li>• Factors contributing in the formation of pharyngeal arches</li><li>• Formation and fate of the Pharyngeal Arches</li></ul>
	14-1-19	<b>Development of pharyngeal pouches &amp; clefts</b>	<ul style="list-style-type: none"><li>• Formation and fate of the Pharyngeal Pouches,</li><li>• Development of tympanic membrane, middle ear cavity, tonsils.</li><li>• Development of Parathyroid glands</li></ul>
	21-1-19	<b>Development of thyroid and tongue</b>	<ul style="list-style-type: none"><li>• <b>Development of thyroid and tongue</b></li><li>• <b>Embryological basis for the nerve supply of tongue</b></li></ul>
	28-1-19	<b>Development of face</b>	<ul style="list-style-type: none"><li>• <b>Factors contributing in formation of facial prominences</b></li><li>• <b>Formation and fate of prominences</b></li></ul>

	28-1-19	<b>Development of face</b>	<ul style="list-style-type: none"> <li>• <b>Formation and fate of the nasal placodes</b></li> <li>• <b>Development of the nasolacrimal duct and lacrimal sac</b></li> <li>• <b>Development of the salivary glands</b></li> </ul>
	4-2-19	<b>Development of palate and palatal defects</b>	<ul style="list-style-type: none"> <li>• Formation and fate of primary palate</li> <li>• Formation and fate of secondary palate</li> <li>• Clinical presentation and embryological basis for the palatal defects</li> </ul>
	11-2-19	<b>Development of eye</b>	<ul style="list-style-type: none"> <li>• Formation and fate of optic vesicle</li> <li>• Formation and fate of lens vesicle</li> <li>• Congenital Anomalies</li> </ul>
	15-2-19	<b>Development of ear</b>	<ul style="list-style-type: none"> <li>• Formation and fate of otic vesicle,</li> <li>• Development of middle ear and External Ear</li> </ul>
	4-3-19 15-3-19	<b>Development of larynx, trachea and lungs</b>  <b>Phases of lung maturation</b>	<ul style="list-style-type: none"> <li>• Development of larynx and trachea</li> <li>• Development and phases of maturation of lungs</li> <li>• Respiratory system defects</li> </ul>
	18-3-19 25-3-19	<b>Development of nervous system</b>	<ul style="list-style-type: none"> <li>• <b>Overview of the formation of neural tube</b></li> <li>• <b>Fate of the neural tube</b></li> <li>• <b>Differentiation of the glial and neurons</b></li> </ul>
	8-4-19 15-4-19	<b>Development of nervous system and pituitary</b>	<ul style="list-style-type: none"> <li>• <b>Development of the spinal cord</b></li> <li>• <b>Formation and fate of basal plates and alar plates</b></li> <li>• <b>Congenital anomalies associated with the developmental process</b></li> </ul>
	6-5-19	<b>Development of esophagus, stomach</b>  <b>Esophageal atresias</b>	<ul style="list-style-type: none"> <li>• Formation and fate of dorsal and ventral mesenteries</li> <li>• Enumeration of derivatives of the Gut tube</li> <li>• Development of esophagus</li> <li>• Clinical presentation and embryological basis for esophageal atresias</li> <li>• Formation of the gastric dilatation</li> <li>• Rotation of the gastric dilatation</li> <li>• Embryological basis for the peritoneal relations of stomach</li> <li>• Embryological basis for the nerve supply of stomach</li> </ul>

			<ul style="list-style-type: none"> <li>• Congenital anomalies associated</li> </ul>
	9-5-19	<b>Development of liver and gall bladder</b>	<ul style="list-style-type: none"> <li>• Formation and fate of hepatic diverticulum</li> <li>• Histogenesis of liver and gall bladder</li> <li>• Development of the extra-hepatic biliary system</li> <li>• Congenital anomalies associated</li> </ul>
	13-5-19	<b>Development of pancreas</b>	<ul style="list-style-type: none"> <li>• Formation and fate of dorsal and ventral pancreatic buds</li> <li>• Histogenesis of pancreas</li> <li>• Formation of the pancreatic ducts</li> <li>• Congenital anomalies associated</li> </ul>
	15-5-2019 to 10-6-2019	<ul style="list-style-type: none"> <li>• <b>Summer Break &amp; Eid ul Fitar</b></li> </ul>	
	13-6-19	<b>Development of midgut</b>	<ul style="list-style-type: none"> <li>• Formation and fate of primary intestinal loop</li> <li>• Physiological herniation of the midgut</li> <li>• Malrotation and Non-rotation syndromes</li> </ul>
	14-6-19	<b>Development of hind gut</b>	<ul style="list-style-type: none"> <li>• Formation and partitioning of cloaca</li> <li>• Development of the anal canal</li> <li>• Embryological basis for the variation in blood supply and lymphatic drainage of anal canal</li> <li>• Congenital anomalies associated</li> </ul>
	17-6-19	<b>Development of heart I</b>	<ul style="list-style-type: none"> <li>• Factors contributing in the development of heart</li> <li>• Establishment of cardiogenic field</li> <li>• Formation of the heart tube</li> <li>• Formation of the cardiac loop</li> <li>• Abnormalities of the cardiac looping</li> </ul>
	20-6-19	<b>Development of heart II</b>	<ul style="list-style-type: none"> <li>• Septum formation in the common atria</li> <li>• Septum formation in the atrio-ventricular canal</li> <li>• Atrial septal defects</li> </ul>
	21-6-19	<b>Development of heart III</b>	<ul style="list-style-type: none"> <li>• Septum formation in the truncus arteriosus and conus cordis</li> <li>• Development of semilunar valves</li> </ul>
	21-6-19	<b>Development of heart IV</b>	<ul style="list-style-type: none"> <li>• Septum formation in the common ventricle</li> <li>• Ventricular septal defects</li> <li>• Formation of conducting system</li> </ul>
	24-6-19	<b>Heart defects</b>	<ul style="list-style-type: none"> <li>• Overview and clinical presentation of <ul style="list-style-type: none"> <li>○ Tetralogy of Fallot</li> <li>○ Persistent ductus arteriosus</li> <li>○ Transposition of great</li> </ul> </li> </ul>

			vessels ○ Valvular stenosis
	25-6-19	<b>Development of arterial system</b>	<ul style="list-style-type: none"> <li>• Formation and fate of aortic arches</li> <li>• Formation and fate of vitelline, dorsal aortae and umbilical veins</li> </ul>
	25-6-19	<b>Development of arterial system II</b>	<ul style="list-style-type: none"> <li>• Arterial system defects</li> <li>• Fetal circulation</li> </ul>
	26-6-19	<b>Development of venous system</b>	<ul style="list-style-type: none"> <li>• Formation and fate of vitelline, umbilical and cardinal veins</li> <li>• Venous system defects</li> </ul>
	27-6-19	<b>Development and patterning of the smooth, skeletal and cardiac muscle</b>	<ul style="list-style-type: none"> <li>• Formation and patterning of the smooth, skeletal and cardiac muscles</li> </ul>
	11-7-19	<b>Development of kidneys</b>	<ul style="list-style-type: none"> <li>• Formation and fate of pronephros</li> <li>• Formation and fate of mesonephros</li> <li>• Formation and fate of metanephros</li> <li>• Differentiation of nephron and collecting tubules from metanephric blastima and ureteric bud</li> <li>• Positional changes of kidneys</li> <li>• Associated congenital anomalies</li> </ul>
	15-7-19	<b>Development of urinary system 2</b>	<ul style="list-style-type: none"> <li>• Development of the urinary bladder</li> <li>• Development of the ureters</li> <li>• Development of the supra-renal glands</li> <li>• Histogenesis of the supra-renal glands</li> <li>• Associated congenital anomalies</li> </ul>
	17-7-19	<b>Development of gonads</b>	<ul style="list-style-type: none"> <li>• Indifferent gonads</li> <li>• Factors influencing the differentiation of gonads</li> <li>• Sex determination and differentiation</li> <li>• Development of testis</li> <li>• Development of ovaries</li> <li>• Descent of ovaries</li> <li>• Associated congenital anomalies</li> </ul>
	17-7-19	<b>Development of male genital system (ducts)</b>	<ul style="list-style-type: none"> <li>• Formation and fate of the Mullarian ducts</li> </ul>
	18-7-19	<b>Development of female genital system (ducts)</b>	<ul style="list-style-type: none"> <li>• Formation and fate of the Wolffian ducts</li> <li>• Factors effecting the development of genital ducts</li> <li>• Associated congenital anomalies</li> </ul>
	19-7-19	<b>Development of external genitalia</b>	<ul style="list-style-type: none"> <li>• Development of male external genitalia</li> <li>• Development of female external</li> </ul>



			<p>genitalia</p> <ul style="list-style-type: none"> <li>• Associated congenital anomalies</li> </ul>
	<p>22-7-19</p> <p>23-7-19</p>	<p><b>Development of body cavities and diaphragm</b></p>	<ul style="list-style-type: none"> <li>• Overview of the formation of intra-embryonic cavity</li> <li>• Division of the intra-embryonic cavity into pleural, pericardial and peritoneal cavities</li> <li>• Sources contributing in the development of diaphragm</li> <li>• Descent of diaphragm</li> <li>• Embryological basis for the nerve supply of diaphragm</li> <li>• Congenital hernias</li> </ul>

# Learning Objectives

## Gross Anatomy

### Region: Head and Neck

### 2<sup>nd</sup> year MBBS

**Facilitators; Dr. Mamoon Naheed, Dr. Sadia**

**Recommended Books:**

- **Clinically Oriented Anatomy Keith. L. Moore 6<sup>th</sup> edition**
- **Clinical Anatomy by Regions Richard S. Snell 8<sup>th</sup> edition**
- **Last's Anatomy 11<sup>th</sup> edition**

Date	Days	Topics	Learning objectives
			<b>At the end of each Lecture the student will be able to Draw/ demonstrate/ write</b>
12-12-2018	Wednesday	Skull  Norma Frontalis	<ul style="list-style-type: none"> <li>• Bony features and attachments.</li> <li>• Boundaries of orbit and contents.</li> <li>• Structures passing through various foramina.</li> </ul>
13-12-2018	Thursday	Norma Verticalis & Occipitalis	<ul style="list-style-type: none"> <li>• Bony features and attachments.</li> <li>• Sutures , fontanelle and clinical aspects.</li> </ul>
14-12-2018	Friday	Norma Lateralis	<ul style="list-style-type: none"> <li>• Bony features, sutures and clinical aspects.</li> <li>• Boundaris of Temporal and Infratemporal fossae.</li> </ul>
17-12-2018	Monday	Norma Basalis	<ul style="list-style-type: none"> <li>• Bony features, relations, attachments and various foramina with structures passing through.</li> </ul>
18-12-2018	Tuesday	Cranial fossae	<ul style="list-style-type: none"> <li>• Bony features, contents, relations, attachments and various foramina with structures passing through.</li> </ul>
19-12-2018	Wednesday	Meninges & Dural venous sinuses	<ul style="list-style-type: none"> <li>• Various types, attachments, special features, spaces between meninges and clinical aspects.</li> <li>• Names, locations, tributaries and clinical aspects.</li> </ul>
20-12-2018	Thursday	Scalp	<ul style="list-style-type: none"> <li>• Different layers, blood supply, nerve supply and clinical aspects.</li> </ul>

21-12-2018	Friday	Mandible	<ul style="list-style-type: none"> <li>• Parts, bony features, joints formed with their type, attachments, important relations, changes with age and ossification.</li> </ul>
24-12-2018	Monday	Face	<ul style="list-style-type: none"> <li>• Cutaneous innervation with clinical aspects.</li> <li>• Blood supply and Lymphatic drainage of face.</li> <li>• Areas of anastomosis with clinical aspects.</li> </ul>
7-1-2019	Monday	Parotid region & 7 <sup>th</sup> Cranial nerve	<ul style="list-style-type: none"> <li>• Masseter muscle with its attachments, nerve supply and blood supply.</li> <li>• Parotid gland with its surfaces, relations, contents, blood supply, nerve supply and clinical aspects.</li> </ul>
8-1-2019	Tuesday	Hyoid bone	<ul style="list-style-type: none"> <li>• Parts, relations, attachments, ossification and clinical aspects.</li> </ul>
9-1-2019	Wednesday	Cervical vertebrae & joints	<ul style="list-style-type: none"> <li>• Parts, features, muscles and ligaments attachments, relations and ossification of cervical vertebrae.</li> <li>• Type, ligaments, movements, muscles producing movements, blood supply, nerve supply and clinical aspects of cervical joints.</li> </ul>
16-1-2019			<b>SUBSTAGE I</b>
10-1-2019	Thursday	Deep cervical fascia & introduction to triangles of neck	<ul style="list-style-type: none"> <li>• Layers, attachments, relations, extent, different contents of deep cervical fascia and various spaces formed with their clinical importance.</li> <li>• Introduction to triangles of neck, attachments, nerve supply and blood supply of sternocleidomastoid and trapezius with clinical aspects.</li> </ul>
11-1-2019	Friday	Anterior triangle of neck	<ul style="list-style-type: none"> <li>• Suprahyoid and infrahyoid muscles with their attachments, nerve supply and ansacervicalis.</li> <li>• Thyroid and submandibular glands with their type, relations, blood supply, nerve supply and clinical aspects.</li> </ul>
14-1-2019 15-1-2019	Monday Tuesday	Anterior triangle of neck	<ul style="list-style-type: none"> <li>• Cervical parts of trachea and esophagus with their nerve supply and blood supply.</li> <li>• Jugular venous system with different tributaries, drainage and clinical aspects.</li> <li>• Carotid system with different branches, distribution and various</li> </ul>

			<p>clinical aspects.</p> <ul style="list-style-type: none"> <li>• Deep cervical lymph nodes.</li> </ul>
17-1-2019	Thursday	Posterior triangle of neck	<ul style="list-style-type: none"> <li>• Boundaries, contents and clinical aspects of posterior triangle.</li> </ul>
18-1-2019	Friday	Cervical plexus & 11 <sup>th</sup> cranial nerve	<ul style="list-style-type: none"> <li>• Location, formation, branches and distribution with clinical aspects of cervical plexus.</li> <li>• Extracranial course, relations and distribution with clinical aspects of 11<sup>th</sup> cranial nerve.</li> </ul>
21-1-2019	Monday	Prevertebral region & Sympathetic chain	<ul style="list-style-type: none"> <li>• Prevertebral muscles with their attachments, relations, nerve supply, actions and clinical aspects.</li> <li>• Location, formation, relations, branches, distribution and clinical aspects of cervical sympathetic chain.</li> </ul>
22-1-2019	Tuesday	Temporal & Infratemporal fossae	<ul style="list-style-type: none"> <li>• Boundaries, contents, communications of fossae.</li> <li>• Muscles of mastication with their attachments, nerve supply actions and clinical aspects.</li> <li>• Maxillary artery with its parts, branches &amp; distribution.</li> </ul>
23-1-2019	Wednesday	Infratemporal Fossa	<ul style="list-style-type: none"> <li>• Mandibular nerve with its course, branches, distribution &amp; clinical aspects.</li> <li>• Otic ganglion with its location, roots, branches and clinical aspects.</li> <li>•</li> </ul>
24-1-2019	Thursday	Temporomandibular joint	<ul style="list-style-type: none"> <li>• Temporomandibular joint with its type, ligaments, blood supply, nerve supply, muscles producing movements, stability and clinical aspects.</li> </ul>
25-1-2019	Friday	Trigeminal nerve	<ul style="list-style-type: none"> <li>• Trigeminal ganglion with its branches, distribution and clinical aspects.</li> </ul>
28-1-2019	Monday	Pterygopalatine fossa	<ul style="list-style-type: none"> <li>• Boundaries, contents and communications of fossa.</li> <li>• Pterygopalatine ganglion and maxillary nerve with their distribution and clinical aspects.</li> </ul>
29-1-2019	Tuesday	Nose & Olfactory nerve	<ul style="list-style-type: none"> <li>• Medial wall with its structure, blood supply, nerve supply and clinical aspects.</li> <li>• Lateral wall with its structure, blood supply, nerve supply and clinical aspects.</li> <li>• Olfactory pathway and clinical aspects.</li> </ul>

30-1-2019	Wednesday	Paranasal sinuses	<ul style="list-style-type: none"> <li>Names, location ,boundaries, nerve supply, blood supply and clinical aspects.</li> </ul>
31-1-2019	Thursday		<ul style="list-style-type: none"> <li><b>SUBSTAGE II, Head &amp; Neck</b></li> </ul>
1-2-2019	Friday	Oral Cavity & hard palate	<ul style="list-style-type: none"> <li>Extent, lips, vestibule, mouth, blood supply and nerve supply.</li> <li>Skeletal framework, blood supply and nerve supply of hard palate.</li> </ul>
4-2-2019	Monday	Soft palate	<ul style="list-style-type: none"> <li>Palatine aponeurosis, Palatal muscles, blood supply, nerve supply and clinical.</li> </ul>
5-2-2019	Tuesday	Tongue & 12 <sup>th</sup> cranial nerve	<ul style="list-style-type: none"> <li>Papillae, Muscles,bloodsupply, nerve supply , lymphatic drainage and clinical of tongue.</li> <li>Extracranial course, relations, distribution and clinical aspects.</li> </ul>
6-2-2019	Wednesday	Pharynx & 9 <sup>th</sup> cranial nerve	<ul style="list-style-type: none"> <li>Constrictor muscles and extrinsic muscles with their attachments, nerve supply, relations, gaps present between them and structures passing through.</li> <li>Internal features of different parts of pharynx with blood supply, nerve supply and clinical importance. Extracranial course, relations, distribution and clinical aspects.</li> </ul>
7-2-2019	Thursday		<b>SUBSTAGE III</b>
8-2-2019	Friday	Larynx	<ul style="list-style-type: none"> <li>Structural frame work ( cartilages, joints and membranes).</li> <li>Muscles of larynx with their nerve supply, actions on vocal cords and laryngeal inlet.</li> </ul>
11-2-2019	Monday	Larynx & 10 <sup>th</sup> Cranial nerve	<ul style="list-style-type: none"> <li>Interior of larynx, blood supply and nerve supply with the clinical spect. Extracranial course, relations, distribution and clinical aspects.</li> </ul>
12,13 Feb 2019	Tuesday wednesday	Orbit, extraocular muscles &Lacrimal apparatus	<ul style="list-style-type: none"> <li>Boundaries and contents.</li> <li>Attachments, nerve supply, actions and clinical aspects of extraocular muscles.</li> <li>Parts, relations, nerve supply, blood supply and clinical aspects of lacrimal apparatus.</li> </ul>
14-2-2019	Thursday	Coats of eye ball & 2 <sup>nd</sup> , 3 <sup>rd</sup> ,4 <sup>th</sup> ,6 <sup>th</sup> Cranial nerves	<ul style="list-style-type: none"> <li>Features of different layers of eye ball with clinical aspects.</li> <li>Course, relations, distribution and clinical aspects of cranial nerves.</li> </ul>
15-2-2019	Friday	External ear & Middle	<ul style="list-style-type: none"> <li>Features, nerve supply and blood supply of external ear.</li> </ul>

		ear	<ul style="list-style-type: none"> <li>Boundaries, contents, blood supply, nerve supply and clinical aspects of middle ear.</li> </ul>
18-2-2019	Monday	Internal ear & 8 <sup>th</sup> Cranial nerve	<ul style="list-style-type: none"> <li>Different parts, their structure and location of receptors.</li> <li>Course, relations and distribution of vestibulocochlear nerve with clinical aspects.</li> </ul>
19-2-2019	Tuesday		
25-2-2019	Friday	Surface marking & Radiology	
		Revision Classes	
11-3-2019	Monday		<b>FINAL STAGE HEAD &amp; NECK</b>
12-3-2019	Tuesday		
13-3-2019	Wednesday		

**Learning Objectives**  
**Gross Anatomy**  
**Region: Neuro-anatomy**  
**2<sup>nd</sup> year MBBS**

**Recommended Books:**

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- **Clinical Anatomy by Regions Richard S. Snell 8<sup>th</sup> edition**
- **Last's Anatomy 11<sup>th</sup> edition**

Date	Day	Topic	Learning objectives  At the end of each Lecture the student will be able to Draw/ demonstrate/ write
4-4-2019	Thursday	Introduction to nervous system	<ul style="list-style-type: none"> <li>• Classification of neurons.</li> <li>• Types of neuroglial cells and their functions.</li> </ul>
5-4-2019	Friday	Receptors, Definitions and Blood supply of brain	<ul style="list-style-type: none"> <li>• Types of various receptors, their location and type of sensation carried by them.</li> <li>• Peripheral and cranial nerve components.</li> <li>• Circle of Willis with formation, branches their distribution &amp; clinical aspects.</li> </ul>

11-4-2019	Monday	Autonomic nervous system	<ul style="list-style-type: none"> <li>• Sympathetic and parasympathetic (afferents, efferent, ganglia and destinations)</li> <li>• Differences between sympathetic and parasympathetic systems.</li> </ul>
12-4-2019	Tuesday	Gross features of spinal cord and blood supply	<ul style="list-style-type: none"> <li>• Meninges, extent, and other external features of spinal cord with its blood supply</li> </ul>
18-4-2019	Wednesday	Gray matter of spinal cord	<ul style="list-style-type: none"> <li>• Various gray horns, commissures, different nuclei present in the gray matter at different segments of spinal cord with their functions.</li> </ul>
19-4-2019	Thursday	White matter of spinal cord	<ul style="list-style-type: none"> <li>• Different white columns, commissures, different tracts present in white matter with their functions.</li> </ul>
25-4-2019	Friday	Gross features of brain stem	<ul style="list-style-type: none"> <li>• External features of midbrain, pons and medulla with their blood supply.</li> </ul>
26-4-2019	Monday	Fourth ventricle	<ul style="list-style-type: none"> <li>• Boundaries, features of the floor and clinical aspects.</li> </ul>
2-5-2019	Tuesday	Internal features of medulla	<ul style="list-style-type: none"> <li>• Sections of medulla at the level of pyramidal decussation and medial lemniscus formation.</li> <li>• Clinical aspects.</li> </ul>
3-5-2019	Wednesday	Internal features of medulla	<ul style="list-style-type: none"> <li>• Sections of medulla at the level of olives and just near to the pons.</li> <li>• Clinical aspects.</li> </ul>
9-5-2019	Thursday	Internal features of pons	<ul style="list-style-type: none"> <li>• Sections at the level of caudal and cranial pons.</li> <li>• Clinical aspects.</li> </ul>
10-5-2019	Friday	Internal features of midbrain	<ul style="list-style-type: none"> <li>• Sections at the level of superior and inferior colliculi. Clinical aspects.</li> </ul>
16-5-2019	Monday	Cerebellum	<ul style="list-style-type: none"> <li>• Parts, topography (lobes and lobules), blood supply and functional division.</li> </ul>
16-5-2019	Tuesday	Cerebellum	<ul style="list-style-type: none"> <li>• Gray matter structure, white matter structure (afferents, efferents and cerebellar peduncles), nuclei embedded and functions with clinical aspects.</li> </ul>
15-2-2019	Wednesday		<b>SUBSTAGE I</b>
17-5-2019	Thursday	Introductio to Diencephalon &Thalamus	<ul style="list-style-type: none"> <li>• Various parts of diencephalon with their location, relations, constituting parts and functions.</li> <li>• Nuclei, their functions, afferents and effernts with clinical aspects.</li> </ul>
13-6-2019	Friday	Hypothalamus	<ul style="list-style-type: none"> <li>• Nuclei, their functions, afferents and efferents with clinical aspects.</li> </ul>



13-6-2019	Monday	Third Ventricle	<ul style="list-style-type: none"> <li>Boundaries and clinical aspects</li> </ul>
14-6-2019	Tuesday	Sulci & Gyri of cerebrum	<ul style="list-style-type: none"> <li>Location, extent and names of various sulci and gyri of cerebrum dividing it into different lobes.</li> </ul>
14-6-2019	Wednesday	Functional areas of cerebrum	<ul style="list-style-type: none"> <li>Various motor and sensory areas with their location, function and specific Brodman's number with clinical aspects.</li> </ul>
20-6-2019	Thursday	White matter of cerebrum	<ul style="list-style-type: none"> <li>Commissural, Association and projection fibers with their definitions, types, functions and clinical aspects.</li> </ul>
21-6-2019	Friday	Lateral ventricle	<ul style="list-style-type: none"> <li>Different horns and their boundaries with clinical aspects.</li> </ul>
21-6-2019	Monday	Basal nuclei	<ul style="list-style-type: none"> <li>Classification, names with their afferents, efferents and clinical aspects.</li> </ul>
27-6-2019	Tuesday	CSF Circulation	<ul style="list-style-type: none"> <li>Formation, circulation and absorption of CSF.</li> <li>Blood brain barrier and blood CSF barrier.</li> </ul>
27-6-2019	Wednesday	Ascending tracts	<ul style="list-style-type: none"> <li>Receptors, 1<sup>st</sup> order, 2<sup>nd</sup> order and 3<sup>rd</sup> order neurons and function of each ascending tract with clinical.</li> </ul>
28-6-2019		Ascending tracts	<ul style="list-style-type: none"> <li>Receptors, 1<sup>st</sup> order, 2<sup>nd</sup> order and 3<sup>rd</sup> order neurons and function of each ascending tract with clinical.</li> </ul>
28-6-2019		Descending tracts	<ul style="list-style-type: none"> <li>1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> order neurons, termination and function of each descending tract with clinical aspects.</li> </ul>
4-7-2019		Descending tracts	<ul style="list-style-type: none"> <li>1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> order neurons, termination and function of each descending tract with clinical aspects.</li> </ul>
5-7-2019		Reticular formation	<ul style="list-style-type: none"> <li>Various nuclear groups with their afferents, efferents, their role and clinical.</li> </ul>
5-7-2019		Limbic system	<ul style="list-style-type: none"> <li>Various parts of limbic system, their afferents, efferents and their functions with clinical aspects.</li> </ul>
22-7-2019			<b>FINAL STAGE NEUROANATOMY</b>
5-8-2019		Revision	

**Learning Objectives**  
**Gross Anatomy**  
**Region: Abdomen and Pelvis**  
**2<sup>nd</sup> year MBBS**

**Facilitators; Professor Dr. Mamoona Naheed, Dr. Sadia**

**Recommended Books:**

- **Clinically Oriented Anatomy Keith. L. Moore 6<sup>th</sup> edition**
- **Clinical Anatomy by Regions Richard S. Snell 8<sup>th</sup> edition**
- **Last's Anatomy 11<sup>th</sup> edition**

Date	Topic	Learning objectives
14-3-2019	Anterior abdominal wall	<p><b>At the end of each Lecture the student will be able to Draw/ demonstrate/ write</b></p> <ul style="list-style-type: none"><li>• Surface land marks, superficial fascia, cutaneous innervation, blood supply, nerve supply, lymphatic drainage and clinical aspects.</li><li>• Abdominal planes, quadrants, and different</li></ul>

		incisions.
15-3-2019 18-3-2019	Anterior abdominal wall	<ul style="list-style-type: none"> <li>• Attachments, nerve supply and actions of abdominal muscles.</li> <li>• Inguinal ligament, conjoint tendon and linea alba formation.</li> <li>• Deep arteries of anterior abdominal wall.</li> <li>• Lumbar triangle.</li> </ul>
19-3-2019	Rectus Sheath	<ul style="list-style-type: none"> <li>• Formation, contents and clinical aspects.</li> </ul>
20-3-2019	Scrotum & testis	<ul style="list-style-type: none"> <li>• Scrotal layers, testicular coverings, blood supply, nerve supply and lymphatic drainage with clinical aspects.</li> </ul>
25-3-2019 26-3-2019	Inguinal Canal & hernia	<ul style="list-style-type: none"> <li>• Boundaries, structures passing through, spermatic cord and its constituents, coverings and clinical.</li> <li>• Types, causes, coverings and differentiation between various types of inguinal hernias.</li> </ul>
27-3-2019	Peritoneum	<ul style="list-style-type: none"> <li>• Layers, vertical disposition, lesser sac, lesser omentum, greater omentum and epiploic foramen with clinical aspects.</li> </ul>
28-3-2019	Peritoneum	<ul style="list-style-type: none"> <li>• Horizontal disposition in abdomen and pelvis.</li> <li>• Compartments, Spaces and gutters in peritoneal cavity with clinical aspects.</li> </ul>
1-4-2019 to 8-4-2019	<ul style="list-style-type: none"> <li>• <b>Spring Break</b></li> </ul>	
09-4-2019	Stomach & Celiac trunk	<ul style="list-style-type: none"> <li>• Stomach with its location, parts, curvatures, stomach bed, blood supply, nerve supply, lymphatic drainage and clinical aspects.</li> <li>• Celiac trunk with its location, branches and their distribution.</li> </ul>
10-4-2019	Liver	<ul style="list-style-type: none"> <li>• Location, lobes, visceral &amp; peritoneal relations, blood supply, nerve supply, lymphatic drainage, surface marking &amp; applied.</li> </ul>
11-4-2019 12-4-2019	Extrahepatic biliary apparatus	<ul style="list-style-type: none"> <li>• Gall bladder and bile duct with their parts, blood supply, nerve supply and clinical aspects.</li> </ul>
15-4-2019	VIVA	<b>SUBSTAGE I</b>
16-4-2019	Pancreas	<ul style="list-style-type: none"> <li>• Parts, relations, blood supply, nerve supply, lymphatics, surface marking and applied.</li> </ul>
17-4-2019	Spleen	<ul style="list-style-type: none"> <li>• Position, relations, features blood supply, nerve supply &amp; lymphatic drainage.</li> </ul>
18-4-2019	Duodenum & recesses	<ul style="list-style-type: none"> <li>• Parts, relations, blood supply, nerve supply and lymphatics with applied aspects.</li> </ul>
19-4-2019	Jejunum & Ileum	<ul style="list-style-type: none"> <li>• Differences between the two with their blood supply, nerve supply, lymphatics and applied.</li> </ul>
22-4-2019	Colon & Blood supply	<ul style="list-style-type: none"> <li>• Caecum, appendix, ascending, descending,</li> </ul>

	large intestine	transverse and sigmoid colon with their blood supply, nerve supply, lymphatics and clinical. <ul style="list-style-type: none"> <li>• Superior &amp; Inferior mesenteric vessels with their branches and distribution.</li> </ul>
23-4-2019	Portal vein & Portocaval anastomosis	<ul style="list-style-type: none"> <li>• Formation, branches, relations &amp; clinical significance.</li> <li>• Different sites of anastomosis and clinical correlation.</li> </ul>
24-4-2019	Lumbar vertebrae	<ul style="list-style-type: none"> <li>• Features, attachments, differences with other vertebrae and ossification.</li> </ul>
25-4-2019	Posterior abdominal wall	<ul style="list-style-type: none"> <li>• Attachments of muscles with nerve supply and actions.</li> <li>• Thoracolumbar fascia with its various layers.</li> </ul>
29-4-2019	Posterior abdominal wall	<ul style="list-style-type: none"> <li>• Blood supply includes, Aorta with its branches and distribution, Inferior vena cava with its tributaries.</li> <li>• Lymphatics and lymph nodes of posterior abdominal wall.</li> </ul>
30-4-2019	Kidneys	<ul style="list-style-type: none"> <li>• Location, features, relations, coverings, blood supply, nerve supply, lymphatics and applied.</li> </ul>
03-5-2019 06-5-2019	Ureters and Suprarenals	<ul style="list-style-type: none"> <li>• Abdominal course, relations of ureters with their blood supply &amp; nerve supply.</li> <li>• Shape, relations blood supply &amp; nerve supply and clinical aspects of suprarenal.</li> </ul>
7-5-2019 8-5-2019	Bony pelvis	<ul style="list-style-type: none"> <li>• Sacrum, Pelvic walls, pelvic outlet, inlet and structures passing through.</li> <li>• Sex differences and position of pelvis.</li> </ul>
10-5-2019	Pelvic floor	<ul style="list-style-type: none"> <li>• Pelvic diaphragm, pelvic fascia, pelvic vessels and nerves</li> </ul>
13-5-2019 14-5-2019	Rectum	<ul style="list-style-type: none"> <li>• Visceral &amp; peritoneal relations, blood supply, nerve supply and lymphatic drainage with clinical aspects.</li> </ul>
17-5-2019 to 10-6-2019	<ul style="list-style-type: none"> <li>• <b>Summer Break &amp; Eid ul Fitat</b></li> </ul>	
11-6-2019	Urinary bladder	<ul style="list-style-type: none"> <li>• Features, relations, surfaces, peritoneal relations, blood supply, nerve supply, lymphatic drainage and clinical.</li> </ul>
12-6-2019	Male reproductive organs	<ul style="list-style-type: none"> <li>• Ductus deferens, seminal vesicles, prostate and urethra with their location, function, blood supply, nerve supply and clinical aspects.</li> </ul>
13-6-2019	Female reproductive organs (ovary & Uterine tubes)	<ul style="list-style-type: none"> <li>• Ovaries and fallopian tubes with their relations, blood supply, nerve supply, lymphatic drainage and clinical.</li> </ul>
14-6-2019	Uterus	<ul style="list-style-type: none"> <li>• Position, parts, peritoneal ligaments, blood supply, nerve supply &amp; lymphatics &amp; clinical aspects.</li> </ul>

14-6-2019	Nerves and blood vessels of pelvis	<ul style="list-style-type: none"> <li>• Sacral plexus and inferior hypogastric plexus with their formation and distribution.</li> <li>• Internal iliac artery with its branches and distribution.</li> </ul>
17-6-2019	Introduction to perineum & urogenital region	<ul style="list-style-type: none"> <li>• Boundaries &amp; division of perineum.</li> <li>• Contents of anal &amp; urogenital triangle, nerve supply, superficial fascia, perineal body, perineal membrane and perineal muscles.</li> </ul>
18-6-2019	Urogenital region	<ul style="list-style-type: none"> <li>• Perineal pouches with their boundaries, contents &amp; clinical.</li> </ul>
19-6-2019	Anal canal	<ul style="list-style-type: none"> <li>• Features, blood supply, nerve supply, lymphatic drainage, &amp; applied aspects</li> <li>• Pelvic sympathetic chain with its distribution.</li> </ul>
20-6-2019	Ischiorectal fossa	<ul style="list-style-type: none"> <li>• Boundaries, contents, spaces, clinical aspects of ischiorectal fossa and pudendal canal with boundaries and contents</li> </ul>
21-6-2019	Radiology & Surface marking	
24-6-2019		<b>FINAL STAGE ABDOMEN &amp; PELVIS</b>

## Learning Objectives

### Histology

#### 2<sup>nd</sup> year MBBS

**Facilitators; Professor Dr. Mamoon Naheed**

**Recommended Books:**

- **Basic Histology Junqueira 12<sup>th</sup> edition**
- **Functional Histology Wheater's**
- **diFiore's Atlas of Histology**

Date	Lecture	Objectives	Practicals
21-11-18 22-11-18	Respiratory system  Nasal cavity, paranasal air sinuses, nasopharynx, larynx & epiglottis.	<ul style="list-style-type: none"> <li>• Introduction to respiratory system, including conduction respiratory parts.</li> <li>• Microscopic structure of walls of nasal cavity &amp; nasopharynx.</li> <li>• Structure of olfactory epithelium.</li> <li>• Ultra-microscopic structure &amp; types of cells forming respiratory epithelium.</li> <li>• Components &amp; layers forming wall of larynx.</li> <li>• Transition of epithelium with its functional correlation.</li> </ul>	Larynx & Epiglottis
28-11-18	Trachea	<ul style="list-style-type: none"> <li>• Microscopic structure of wall of trachea with components forming mucosa, submucosa, cartilage and adventitia.</li> <li>• Changes in microscopic structure of bronchial tree as we go down the conducting passages, till alveoli of respiratory passages.</li> </ul>	Trachea
29-11-18	Lung	<ul style="list-style-type: none"> <li>• Microscopic structure of lung with different cell types present.</li> <li>• Blood air barrier.</li> <li>• Clinical conditions e.g. immotile cilia syndrome, histological basis of asthma, cancer.</li> </ul>	Lung
5-12-18 6-12-18 21-01-19	GIT & Associated Glands  Lip, vestibule, Oral cavity, palate.	<ul style="list-style-type: none"> <li>• Introduction to various parts of gastrointestinal tube.</li> <li>• Elaboration of components forming different layers of lip structure, including mucosa covering internal part, red zone &amp; cutaneous surface covered by skin. Central layer of skeletal muscle.</li> </ul>	Lip
12-12-18		<ul style="list-style-type: none"> <li>• Monthly test – 1</li> </ul>	
28,29,30 Jan 2019.	Tongue & structure of taste buds.	<ul style="list-style-type: none"> <li>• Structure of tongue, various types of papillae with their structure &amp; location.</li> <li>• Microscopic anatomy of taste buds with their location &amp; functional correlation.</li> </ul>	Tongue

4,5,6 Feb 2019	Pharynx & oesophagus	<ul style="list-style-type: none"> <li>• General constitution of gastrointestinal tube, with components of four layers.</li> <li>• Structure of pharynx.</li> <li>• Histological structure of oesophagus with differences in upper, middle &amp; lower parts.</li> </ul>	Oesophagus
18,19,20 Feb 2019	Stomach	<ul style="list-style-type: none"> <li>• Microscopic structure of four layers of stomach.</li> <li>• Regional differences between different regions including cardia, fundus &amp; body and pylorus.</li> <li>• Parts &amp; Ultramicroscopic structure of gastric glands</li> <li>• Structure of Cardioesophageal &amp; gastroduodenal junctions.</li> <li>• Clinical condition reflux esophagitis.</li> </ul>	Stomach
25,26,27 Feb 2019	Small intestine	<ul style="list-style-type: none"> <li>• Histological structure of different layers of small intestine.</li> <li>• Regional differences between three parts.</li> <li>• Structure of peyer's patch with their clinical significance.</li> </ul>	Duodenum Jejunum & Ileum.
4,5,6 March 19	Large intestine	<ul style="list-style-type: none"> <li>• Histological structure of different layers of large intestine.</li> <li>• Microscopic structure of appendix.</li> </ul>	Colon & appendix
4,5,6 March 19	Rectum	<ul style="list-style-type: none"> <li>• Special features of all four layers of rectum.</li> <li>• Distinguishing features from pylorus of stomach.</li> </ul>	Rectum
9-1-19		<ul style="list-style-type: none"> <li>• Monthly test –2</li> </ul>	
4,5,6 March 19	Anal canal	<ul style="list-style-type: none"> <li>• Changes of epithelium at junctions.</li> <li>• Specialized features that differentiate anal canal from esophagus.</li> </ul>	Anal canal
21,22,23 Jan 2019	Salivary glands	<ul style="list-style-type: none"> <li>• Histological structure of serous &amp; mucous acini.</li> <li>• Structure of parotid, sub-mandibular &amp; sub-lingual salivary glands.</li> <li>• Salient features that compare &amp; contrast them.</li> </ul>	Parotid, submandibular & sublingual glands
11,12,13 March 19	Liver & gallbladder	<ul style="list-style-type: none"> <li>• Division of liver parenchyma into different lobules with their clinical significance.</li> <li>• Histological structure of liver.</li> <li>• Microscopic anatomy of gall bladder.</li> </ul>	Liver & gall bladder

18,19,20 March 19	Pancreas	<ul style="list-style-type: none"> <li>• Microscopic structure of exocrine pancreas.</li> <li>• Distinguishing features of exocrine pancreas from salivary glands.</li> <li>• Histology of endocrine pancreas.</li> </ul>	Exocrine & endocrine pancreas
10,11,12 Dec 2018	Pituitary gland	<ul style="list-style-type: none"> <li>• Microscopic anatomy of pituitary gland with its embryological background.</li> </ul>	Pituitary gland
14,15,16 Jan 2019	Thyroid & parathyroid gland	<ul style="list-style-type: none"> <li>• Histological structure of thyroid gland with its functional correlation.</li> <li>• Microscopic picture of parathyroid gland.</li> </ul>	Thyroid & parathyroid gland.
1,2 Jan 2019	Adrenal gland	<ul style="list-style-type: none"> <li>• Histological structure of adrenal gland with specifying three layers of cortex.</li> <li>• Distinguishing features of cortex from medulla.</li> </ul>	Adrenal gland
8,9,10 April 2019	Urinary system  Kidney	<ul style="list-style-type: none"> <li>• Microscopic anatomy of kidney.</li> <li>• Arrangement of different parts of nephron &amp; collecting ducts in cortex &amp; medulla.</li> <li>• Components of filtration barrier.</li> <li>• Parts of juxtaglomerular apparatus with their functional correlation &amp; clinical significance.</li> </ul>	Kidney
15,16,17 April 19	Ureter & urinary bladder	<ul style="list-style-type: none"> <li>• Microscopic &amp; ultramicroscopic structure of urothelium.</li> <li>• Histology of ureteric wall.</li> <li>• Microanatomy of urinary bladder.</li> </ul>	Ureter & urinary bladder
15,16,17 April 2019	Urethra	<ul style="list-style-type: none"> <li>• Epithelial lining of male &amp; female urethra.</li> <li>• Histological structure of male urethra. Its differences from female urethra.</li> </ul>	Male urethra
13-2-19		<ul style="list-style-type: none"> <li>• Term test -1</li> </ul>	
22,23,24 April 2019	Male Reproductive System  Testis	<ul style="list-style-type: none"> <li>• Structure of testis.</li> <li>• Ultra-structure of germinal epithelium.</li> <li>• Blood testis barrier.</li> </ul>	Testis
22,23,24 April 2019	Epididymus & vas deferens	<ul style="list-style-type: none"> <li>• Histological structure of Epididymus &amp; vas deferens.</li> <li>• Ultra-microscopic structure of lining epithelium.</li> </ul>	Epididymus & vas deferens



6,7,8 May 2019	Seminal vesicles	<ul style="list-style-type: none"> <li>• Microscopic anatomy of seminal vesicles with functional correlation.</li> </ul>	Seminal vesicles
6,7,8 May 2019	Prostate gland	<ul style="list-style-type: none"> <li>• Histology of prostate gland.</li> <li>• Age estimation under microscope.</li> </ul>	Prostate gland
13,14,15 May 2019	Female reproductive system  Ovary	<ul style="list-style-type: none"> <li>• Structure of ovary.</li> <li>• Microscopic structure of different ovarian follicles.</li> </ul>	Ovary
27,28,29 May 2019	Fallopian tube	<ul style="list-style-type: none"> <li>• Histological structure of wall of fallopian tube (oviduct).</li> <li>• Ultra-microscopic picture of lining epithelium.</li> </ul>	Fallopian tube
20,21,22 May 2019	Uterus	<ul style="list-style-type: none"> <li>• Microscopic picture of uterus.</li> <li>• Menstrual cycle related changes in histology of endometrium.</li> </ul>	Uterus three phases (menstrual, Proliferative & secretory).
27,28,29 May 2019	Cervix & vagina	<ul style="list-style-type: none"> <li>• Structure of cervix &amp; vagina.</li> <li>• Change of epithelium at internal os.</li> </ul>	Cervix & vagina
13-3-19		<ul style="list-style-type: none"> <li>• Monthly test –3</li> </ul>	
13-3-19	Mammary gland	<ul style="list-style-type: none"> <li>• Microscopic picture of mammary gland.</li> <li>• Age related changes in histology of gland.</li> <li>• Microscopic differences in parenchyma &amp; stroma in active &amp; inactive glands.</li> <li>• Anatomical basis of clinical conditions like cancer.</li> </ul>	Mammary gland  (Active & inactive)
25,26,27 March 2019	Special senses  Eye lid, conjunctiva, cornea, sclera and choroids	<ul style="list-style-type: none"> <li>• Structure of eyelid, conjunctiva, cornea &amp; sclera.</li> <li>• Functional correlation of each part with its histology.</li> </ul>	Special senses  Eye lid, conjunctiva, cornea, sclera and choroid.

	coat.		
20-3-19	Retina	<ul style="list-style-type: none"> <li>• Two layers of retina, ultra structure of retinal layers.</li> <li>• Clinical anatomy of detachment of retina.</li> </ul>	Retina
25,26,27 March 2019	Internal ear	<ul style="list-style-type: none"> <li>• Microscopic structure of organ of corti, with different types of cells.</li> </ul>	Internal ear
	<b>Test 2</b>		

**Introduction of faculty  
Department of Anatomy**

<b>Name</b>	<b>Qualification</b>	<b>Designation</b>
<b>Professor Dr.Mamoonah Nasim</b>	MBBS M.Phil, Phd	Head of Department
<b>Professor Dr.Mammoonah Naheed</b>	MBBS M.Phil	Professor of Anatomy
<b>Dr.Faiza Rauf</b>	MBBS, M.Phil	Assistant professor
<b>Dr.Nadeem Sharif</b>	MBBS, FCPS	Assistant Professor
<b>Dr.Hafiza Sadia</b>	MBBS, M.Phil Part-1	Sr. Demonstrator
<b>Dr.Asia Nazir</b>	MBBS, M.Phil Part-1	Sr. Demonstrator
<b>Dr.Mushtaq Ahmed</b>	MBBS	Demonstrator
<b>Dr.Khauia Shamim</b>	MBBS	Demonstrator
<b>Dr. Rizwan</b>	MBBS	Demonstrator