

# Anatomy

## Departmental Objectives

At the end of the Anatomy course, the students should be able to:

- mention, identify, show, draw and describe the structural components of the body responsible for carrying out normal body functions;
- use the above knowledge to understand, correlate and appreciate the other pre-clinical, para-clinical and clinical medical subjects;
- apply the knowledge of Anatomy with the knowledge of other medical subjects to provide optimum health services in the country and abroad.

## List of Competencies to acquire :

- Adequate knowledge of the structural components of the body & correlate it with normal body functions.
- Using the above knowledge to understand, correlate and appreciate the other subjects to be taught in the para-clinical and clinical medical courses.
- Applying the knowledge of Anatomy with the knowledge of other medical subjects to provide optimum health services in the country and abroad.

## Distribution of teaching - learning hours

Lecture	Tutorial	Practical (Histology)	Demonstration +Dissection +Card exam	Total Teaching hours	Integrat ed teaching in for phase I	Formative Exam		Summative exam	
						Preparat ory leave	Exam time	Preparato ry leave	Exam time
115 hrs	53hrs	52 hrs	310hrs	530hrs	30 hrs	21+14= 35 days	42 days	30days	30 days
<i>(Time for exam. preparatory leave and formative &amp; summative assessment is common for all subjects of the phase )</i>									

## Teaching - learning methods, teaching aids and evaluation

Teaching Methods			Teaching aids	In course evaluation
Large group	Small group	Self learning		
Lecture Integrated teaching	Tutorial Practical Demonstration	Self-study & self-assessment	Computer / laptop & Multimedia OHP, Transparency & Transparency marker White board & different colour white board markers Black board & white and coloured chalks Cadavers, prosected parts, bones, viscera Slide and slide projector Microscope	<ul style="list-style-type: none"> <li>• Item Examination</li> <li>• Card Final Examination (written/oral + practical)</li> <li>• Term Final Examination (written, oral+ practical)</li> </ul>

**Related Equipments:** Flip Chart, Photograph, Model, X-ray films (CT scan and other imaging films), View box, Diagram, Preserved specimens, Living body for surface marking, Simulation.

### 1<sup>st</sup> Professional Examination:

#### Marks distribution of Assessment of Anatomy

**Total marks – 500**

- Written=200 (Formative 20+MCQ 40+SAQ140)
- SOE=150
- Practical=150

## Learning Objectives and Course Contents in Anatomy

Learning Objectives	Contents	Teaching hours Total : 12 hrs
<p><b>General Anatomy</b> Student will be able to</p> <ul style="list-style-type: none"> <li>• define anatomy, explain the subdivisions of anatomy</li> <li>• describe the anatomical terminology, planes &amp; positions</li> <li>• define bone. Describe the composition ,blood supply, functions &amp; ossification of bones.</li> <li>• describe composition characteristics, location and functions of different types of cartilages.</li> <li>• define &amp; classify joints, the characters, stability &amp; movements of joints and correlate with the clinical conditions</li> <li>• classify muscles, their properties and functions and also classify skeletal muscle morphologically &amp; functionally</li> <li>• define &amp; classify blood vessels,</li> <li>• describe the systemic, portal &amp; pulmonary circulation.</li> <li>• describe different types of vascular anastomosis with their functional &amp; clinical implications.</li> <li>• describe components ,functions &amp; the general plan of lymphatic drainage of the whole body.</li> <li>• classify &amp; describe the functions of lymphoid organs</li> </ul>	<p><b>CORE :</b></p> <ul style="list-style-type: none"> <li>• Definition, subdivisions of Anatomy and its importance in the study of medicine.</li> <li>• Anatomical terminology and anatomical planes &amp; positions.</li> <li>• Skeletal system- Bones – classification, composition, functions, parts of a developing long bone ,blood supply, periosteum &amp; endosteum. Ossification-definition, centres, processes. Factors affecting growth of bone..</li> <li>• Cartilages- composition, types , characters ,locations and functions</li> <li>• Joint: classification, characteristics of each type &amp; movements, stability of the joints. Clinical conditions associated with joints .General plan of blood supply &amp; nerve supply of joints.</li> <li>• Muscular system, classification, characteristics and functions . Skeletal muscle -classification</li> <li>• Blood vascular system: component parts. General plan. Structure, classification Differences between different types of vessel. Nutrition &amp; innervations of vessels Circulation : types, characteristic features of each type</li> <li>• Lymph vascular system : components, characteristic features of lymph capillaries .Differences with blood capillary .Lymphoid organs: classification &amp; functions</li> </ul>	<p><b>TERM I</b></p> <p>01 hr</p> <p>01 hr</p> <p>03 hrs</p> <p>01 hr</p> <p>02 hrs</p> <p>01 hr</p> <p>02 hrs</p> <p>01 hr</p>

Learning Objectives	Contents	Teaching hours
Student will be able to <ul style="list-style-type: none"> <li>Describe the basic facts on origin of life, evolution of life and animal kingdom.</li> </ul>	<u><b>Additional:</b></u> <ul style="list-style-type: none"> <li>Origin of life on earth.</li> <li>Evolution of life on earth.</li> <li>The animal kingdom</li> </ul>	
<p><b><i>Cell Biology</i></b>            Student should be able to:</p> <ul style="list-style-type: none"> <li>define and describe the human cell &amp; its constituents ,structure &amp; functions of cell membrane.</li> <li>describe the structure &amp; functions of nucleus</li> <li>describe the structure &amp; functions of organelles &amp; inclusions</li> <li>describe the features of different types of cells: protein secreting, ion transporting, steroid secreting, mucus secreting, antibody producing cell.</li> </ul> <p><b><i>Human Genetics</i></b>            Students will be able to:</p> <ul style="list-style-type: none"> <li>define terms related to human genetics</li> <li>describe the different basic features of chromosomes</li> <li>explain structure, function, basis of protein synthesis of DNA &amp; RNA</li> <li>define allele homozygous, Heterozygous karyotyping</li> <li>explain Mendel’s Law of inheritance &amp; Lyon’s hypothesis</li> </ul>	<p><u><b>CORE:</b></u></p> <ul style="list-style-type: none"> <li>Human Cell-Basic organization, types constituents, cell membrane</li> <li>nucleus</li> <li>cytoplasm &amp; organelles and inclusions</li> <li>Functional correlation of different types of cell with their particular-nuclear, cytoplasmic, membrane and surface feature</li> </ul> <p><u><b>CORE:</b></u></p> <p>Terms &amp; definitions: Gene, Gene locus, genome, genotype, phenotype, genetic trait etc.</p> <ul style="list-style-type: none"> <li>Chromosomes: Structure, types, bio-chemical nature, &amp; chromosomal disorders</li> <li>DNA and RNA: Structure, function, basis of protein synthesis</li> <li>Allele , homozygous, Heterozygous Karyotyping</li> </ul> <p><u><b>Additional:</b></u></p> <ul style="list-style-type: none"> <li>Mendels law of inheritance &amp; Lyon’s hypothesis</li> <li>Outline of recent advances in Genetics</li> <li>Principles of genetic engineering</li> <li>Principles of cloning</li> </ul>	<p><u><b>Total:06 hrs.</b></u>  <b>TERM I</b>            02 hrs            01 hr            02 hrs            01hr  <u><b>Total: 04 hrs</b></u>  <b>TERM I</b>            01hr            01 hrs            01 hrs            01 hr</p>

Learning Objectives	Contents	Teaching hours Total :12 hours
<p><b>General Histology</b> Student should be able to:</p> <ul style="list-style-type: none"> <li>define and classify the basic tissues in the body</li> <li>describe the different types, characters, distribution and the functions of epithelial tissue describe the cell Surface specialization &amp; Junctional complexes.</li> <li>describe the composition, characters, distribution and the functions of connective tissue. Describe the structure &amp; functions of different types of connective tissue cells</li> <li>describe the histological structures of smooth muscle, cardiac muscle &amp; skeletal muscle. Describe the mechanism of muscle contraction.</li> <li>describe the structure &amp; functions of neuron &amp; neuroglia</li> </ul>	<p><b>General Histology</b> <b>Basic tissues:</b> Definition, Classification, Components, Characters, Distribution and Functions of</p> <ul style="list-style-type: none"> <li>Epithelium <ul style="list-style-type: none"> <li>-Surface epithelium</li> <li>-glandular epithelium</li> </ul> </li> <li>Connective tissue <ul style="list-style-type: none"> <li>- Proper</li> <li>- special</li> </ul> </li> <li>Muscular tissue <ul style="list-style-type: none"> <li>-smooth</li> <li>-cardiac</li> <li>-skeletal</li> </ul> </li> <li>Nervous tissue <ul style="list-style-type: none"> <li>-neurons</li> <li>-neuroglia</li> </ul> </li> </ul>	<p><b>TERM I</b></p> <p>04hrs</p> <p>04 hrs</p> <p><b>TERM II</b></p> <p>02 hrs</p> <p><b>TERM III</b></p> <p>02 hrs</p>

Learning Objectives	Contents	Teaching hours <u>Total 18 hrs</u>
<p><i>Systemic Histology:</i> Students will be able to describe the histological structures of different parts of body system</p>	<p><i>Systemic Histology :</i> histological structures of</p> <ul style="list-style-type: none"> <li>• Respiratory system</li> <li>• Vascular system</li>   <li>• Lymphoid organs</li> <li>• Digestive system &amp; associated Glands</li> <li>• Exocrine glands ( salivary )</li> <li>• Urinary system</li> <li>• Endocrine glands</li> <li>• Male reproductive system</li> <li>• Female reproductive system</li>   <li>• Integumentary system</li> <li>• Special sense organs</li> </ul>	<p><b>TERM I</b> 01 hr 01 hr</p> <p><b>TERM II</b> 02 hrs 03 hrs 01 hr 02 hr 02 hrs 02 hrs 02 hrs</p> <p><b>TERM III</b> 01 hr 01 hr</p>

Learning Objectives	Contents	Teaching hours Total 18hrs
<p><b>General Embryology</b> Students will be able to:</p> <ul style="list-style-type: none"> <li>define terms related to embryology</li> <li>explain the significance of study of embryology</li> <li>explain proliferation, growth, differentiation, inductors, evocators and organiser</li> <li>describe different types of cell division</li> <li>describe chromosomal changes during cell division with anomalies</li> <li>describe oogenesis and spermatogenesis</li> <li>describe the process of fertilization</li> <li>describe the events of 1<sup>st</sup> week of development.</li> <li>describe the events 2<sup>nd</sup> week of development.</li> <li>describe the events 3<sup>rd</sup> week of development.</li> <li>describe the development &amp; derivatives of ectoderm, mesoderm &amp; endoderm.</li> <li>explain the development of foetal membranes</li> <li>explain the development of twins &amp; their types.</li> <li>describe the causes &amp; types of congenital anomalies</li> <li>explain the process of human evocation</li> <li>describe the Molecular regulation &amp; cell signaling pathways</li> </ul>	<p><b>CORE:</b></p> <ul style="list-style-type: none"> <li>Introduction: Terms and Definition Significance of study of embryology Basic process of development : proliferation, growth, differentiation, inductors, evocators and organizer <ul style="list-style-type: none"> <li>Cell division: Types</li> <li>Gametogenesis and maturation of Germ cells.</li> </ul> </li> <li>Fertilization: Events, factors influencing the fertilisation Progress in 1<sup>st</sup> week of development</li> <li>Progress in 2<sup>nd</sup> week of development.</li> <li>Progress in 3<sup>rd</sup> week of development.</li> <li>Derivatives of germ layers: ectoderm, mesoderm &amp; endoderm.</li> <li>Foetal membranes : Placenta, Chorion, Amnion, Umbilical cord, Yolk sac etc.</li> <li>Twins Teratology</li> </ul> <p><b>Additional:</b></p> <ul style="list-style-type: none"> <li>Human Evolution</li> <li>Concepts of medical biotechnology in relation to embryology</li> <li>Molecular regulation &amp; cell signaling</li> </ul>	<p><b>TERM I</b></p> <p>01 hr</p> <p>01 hr</p> <p>02 hrs</p> <p>02 hrs</p> <p>02 hrs</p> <p>02 hr</p> <p>02 hrs</p> <p>01 hr</p> <p><b>TERM II</b></p> <p>03 hrs</p> <p>02 hrs</p>

Learning Objectives	Contents	Teaching hours Total 24 hrs
<p><b><i>Systemic Developmental Anatomy</i></b>            Student will be able to:</p> <ul style="list-style-type: none"> <li>• describe the process of development of different body system</li> <li>• describe the developmental anomalies of different body system</li> </ul> <ul style="list-style-type: none"> <li>• mention general outline of development of: Thoracic duct, Cysterna chyli, Inferior Vena Cava, Superior Vena Cava, Portal Vein, Brachiocephalic veins, &amp; Renal veins.</li> </ul>	<p><b>CORE:</b>            Development and their Anomalies of</p> <ul style="list-style-type: none"> <li>• Skeletal system &amp; vertebral column</li> <li>• Muscular system</li> <li>• Upper and lower limb</li> <li>• Digestive system with associated glands</li> <li>• Respiratory system</li> <li>• Cardiovascular System &amp; aortic arches</li> <li>• Coelomic cavity &amp; the diaphragm</li> <li>• Skin &amp; mammary gland</li> <li>• Urinary system</li> <li>• Male and female Reproduction system</li>   <li>• Pituitary &amp; suprarenal gland</li> <li>• Face &amp; neck &amp; their associated organs</li> <li>• Nervous System</li> <li>• Eye &amp; Ear</li> </ul> <p><b>Additional:</b>            Development of</p> <ul style="list-style-type: none"> <li>• Lymphatic System</li> <li>• Vascular System</li> </ul>	<p><b>TERM II</b></p> <p>02 hrs</p> <p>01 hr</p> <p>03 hrs</p> <p>01 hr</p> <p>03 hrs</p> <p>01 hr</p> <p>01 hr</p> <p>02 hrs</p> <p>03 hrs</p> <p><b>TERM III</b></p> <p>01 hr</p> <p>03 hrs</p> <p>02 hrs</p> <p>01 hr</p>

Learning Objectives	Contents	Teaching hours Total 21 hrs
<p><b>Neuroanatomy</b> Students will be able to:</p> <ul style="list-style-type: none"> <li>• classify nervous system. Describe composition of grey matter and white matter</li> <li>• explain the structure, process of myelination, degeneration &amp; regeneration of nerve fibres</li> <li>• define &amp; classify synapse, receptors .describe the structure &amp; functions of receptor &amp; synapse</li> <li>• define autonomic nervous system, describe the different parts of autonomic nervous system .nerve plexuses &amp; ganglia Pia, arachnoid and dura mater Extension, folds, spaces, nerve supply &amp; blood supply</li> <li>• explain blood brain &amp; blood CSF barrier</li> <li>• describe the formation, composition, circulation, absorption &amp; functions of CSF</li> <li>• describe the ventricles of brain</li> <li>• describe the different lobes, Gyri, sulci and important functional areas with effects of lesion .Explain the mode of blood supply of cerebrum</li> </ul>	<p><b>CORE:</b></p> <ul style="list-style-type: none"> <li>• Introduction to Nervous system,</li> <li>• Nerve fibres, : structure classifications &amp; functions, myelination degeneration, regeneration</li> <li>• Receptors : structure classifications location &amp; functions</li> <li>• Synapse : structure classifications &amp; functions</li> <li>• Autonomic nervous system, autonomic nerve plexuses &amp; ganglia</li> <li>• Coverings of brain and spinal cord, Pia, arachnoid and dura mater Extension, folds, spaces, nerve supply &amp; blood supply Barriers of brain</li> <li>• Cerebrospinal fluid (CSF)</li> <li>• Ventricles of brain</li> <li>• <b>Motor system</b> Cerebrum: Lobes: gyri, sulci Functional Areas ,Blood supply</li> </ul>	<p><b>TERM I</b> 01 hr</p> <p><b>TERM III</b> 01hr</p> <p>01 hrs</p> <p><b>TERM I &amp; TERM II</b> 02 hrs</p> <p><b>TERM III</b> 02 hrs</p> <p>02 hrs</p>



Learning Objectives	Contents	Teaching hours
<p><b>Neuroanatomy</b> Students will be able to:</p> <ul style="list-style-type: none"> <li>describe Pyramidal &amp; extrapyramidal system &amp; effects of their lesion</li> <li>describe functional lobes, nuclei, peduncles, blood supply, functions &amp; clinical conditions of cerebellum</li> <li>describe location, parts, blood supply, functions &amp; clinical conditions of basal nuclei</li> <li>classify cranial nerves, explain functional components and cranial nerve nuclei, and describe the course of III, IV, V, VI, VII, IX, X, XI, XII cranial nerves .</li> <li>explain &amp; define dermatome &amp; axial line</li> <li>describe the ascending tracts with effects of lesions</li> <li>describe the thalamus, hypothalamus</li> <li>explain functional components nuclei, and course of I, II, VIII, cranial nerves . Explain the smell, visual &amp; auditory pathway</li> <li>describe the length, extension, enlargements sections of spinal cord at different level</li> <li>describe the parts , blood supply and significance of brain stem.</li> <li>describe the cross sections of midbrain , pons &amp; medulla oblongata at different level</li> <li>describe the arrangement &amp; functions reticular formation</li> <li>describe the parts &amp; functions of limbic system</li> </ul>	<p><b>CORE:</b></p> <ul style="list-style-type: none"> <li>Pyramidal &amp; extrapyramidal system</li> <li>Cerebellum: parts , functions , blood supply, clinical conditions</li> <li>Basal nuclei : locations, parts , functions artery supply &amp; clinical conditions</li> <li>Motor &amp; mixed cranial nerves</li> <li><b>Sensory system:</b> Dermatome &amp; axial line</li> <li>Ascending tracts of spinal cord</li> <li>Diencephalon : parts &amp; functions</li> <li>Sensory cranial nerves &amp; Smell, visual &amp; auditory pathway</li> <li>Spinal Cord: Length, extension, Enlargement ,Blood supply, Cross-sections at different level</li> <li>Brain stem : blood supply, cross sections at different levels</li> <li>Reticular formation</li> <li>Limbic system</li> </ul>	<p><b>TERM III</b></p> <p>02 hrs</p> <p>01 hr</p> <p>01 hr</p> <p>02 hr</p> <p>01hr</p> <p>01 hr</p> <p>01 hr</p> <p>02 hrs</p> <p>01hr</p>

Learning Objectives	Contents	Teaching hours
<p><b>Living (surface) Anatomy</b></p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>locate and count ribs and costal cartilages</li> <li>draw and demonstrate on the surface of the body important anatomical points and structures of Thorax</li> </ul> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>draw and demonstrate on the surface of the body important anatomical points and structures of Superior extremity</li> </ul>	<p><b>Thorax</b></p> <p><b><u>CORE:</u></b></p> <ul style="list-style-type: none"> <li>Counting of ribs and costal cartilages</li> <li>Heart- apex and borders</li> <li>Lung-borders and apex,</li> <li>Trachea &amp; Bronchi</li> <li>Esophagus</li> <li>Triangle of auscultation</li> <li>Jugular notch</li> <li>Sternal angle</li> <li>Area of Superficial Cardiac dullness</li> <li>Common carotid and subclavian artery</li> <li>Internal thoracic artery</li> </ul> <p><b>Superior extremity</b></p> <p><b><u>CORE</u></b></p> <ul style="list-style-type: none"> <li>Nerves: Radial, Ulnar, Median nerve, Axillary nerve</li> <li>Arteries: Brachial, Radial ,Ulnar artery, Superficial and deep palmar arch</li> <li>Veins: cephalic, basilic &amp; Median cubital vein</li> <li>Flexor retinaculum</li> <li>Anatomical snuff box</li> <li>Medial humeral epicondyle</li> </ul>	<p>06 hrs.</p> <p>04 hrs.</p>

Learning Objectives	Contents	Teaching hours
<p><b>Living (surface) Anatomy</b></p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>locate, demonstrate on the surface of the body the different anatomical planes and land marks</li> <li>draw, demonstrate on the surface of the body the nine regions of the abdomen</li> <li>draw and indicate inguinal canal on the surface of the body</li> <li>draw and demonstrate on the surface of the body Important anatomical points, borders and parts of important organs of abdomen</li> </ul> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>locate and demonstrate on surface of the body important points and structures of inferior extremity</li> </ul>	<p><b>CORE:</b></p> <p><b>Abdomen</b></p> <ul style="list-style-type: none"> <li>Trans-pyloric plane, Trans tubercular plane, Subcostal plane, mid clavicular line</li> <li>Regions of abdomen</li> <li>Superficial &amp; deep inguinal ring. Inguinal canal <ul style="list-style-type: none"> <li>Abdominal aorta &amp; inferior vena cava</li> </ul> </li> <li>Stomach, Duodenum, Pancreas, Liver, Gall bladder, Bile duct , spleen, Kidney from back &amp; Mac Burney’s point.</li> <li>Transverse colon, ureter from front and back, celiac trunk , splenic artery, Root of the mesentery.</li> </ul> <p><b>Inferior extremity</b></p> <ul style="list-style-type: none"> <li>Common peroneal nerve, Tibial nerve</li> <li>Popliteal artery</li> <li>Anterior &amp; posterior tibial artery</li> <li>Arteria dorsalis pedis</li> <li>Great Saphenous vein</li> <li>Small Saphenous vein</li> <li>Adductor tubercle</li> <li>Lateral and Medial Malleolus</li> <li>Greater trochanter of femur</li> <li>Anterior superior iliac spine</li> </ul> <p><b>Additional</b></p> <ul style="list-style-type: none"> <li>Femoral nerve, sural nerve, Medial and lateral plantar artery, plantar arch.</li> </ul>	<p>6 hrs.</p> <p>4 hrs.</p>

Learning Objectives	Contents	Teaching hours
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>draw and demonstrate on the surface of the body important anatomical points and structures of Head and Neck</li> </ul>	<p><b>Head and neck</b></p> <ul style="list-style-type: none"> <li>Facial artery , Facial vein</li> <li>Internal jugular vein, External jugular vein</li> <li>Common Carotid artery &amp; its bifurcation</li> <li>Facial Nerve &amp; their branches</li> <li>vagus nerve in the neck</li> <li>Parotid gland and its duct</li> <li>Frontal and maxillary air sinuses</li> <li>Thyroid gland</li> <li>Tip of the coracoid process</li> <li>Inferior angle of scapula</li> <li>Tip of the 7<sup>th</sup> cervical spine</li> </ul> <p><b><u>Additional:</u></b></p> <ul style="list-style-type: none"> <li>Pterion, lambda</li> <li>Middle meningeal artery</li> </ul>	<p>04 hrs.</p>

Learning Objectives	Contents	Teaching hours
<p><b><i>Anatomy of Radiology &amp; Images</i></b> Students will be able to:</p> <ul style="list-style-type: none"> <li>• describe Radio opaque structures Radio-lucent structures</li> <li>• identification and location of normal structures by: Radiography</li> </ul>	<p><b><u>CORE</u></b></p> <p>Radio opaque structures Radio-lucent structures <i>Plain X-ray of the</i></p> <ul style="list-style-type: none"> <li>-chest PA view</li> <li>-abdomen AP view</li> <li>-pelvis AP view</li> <li>-arm including proximal &amp; distal joints AP &amp; lateral view</li> <li>-forearm including proximal &amp; distal joints AP &amp; lateral view</li> <li>-hand including proximal &amp; distal joints</li> <li>-thigh including proximal &amp; distal joints AP &amp; lateral view</li> <li>-leg including proximal &amp; distal joints AP &amp; lateral view</li> <li>-foot including proximal &amp; distal joints AP &amp; lateral view</li> <li>-head &amp; neck (cervical spine) AP &amp; lateral view</li> <li>-Paranasal sinuses OM view</li> </ul> <p><b><u>Additional:</u></b></p> <ul style="list-style-type: none"> <li>• Common normal Ultrasonographs, Isotope scan,</li> <li>• Magnetic Resonance Images (MRI), CT Scan</li> <li>• Coronary Angiograph</li> </ul>	

Learning Objectives	Contents	Teaching hours
<p><b><i>Clinical Anatomy</i></b> Students will be able to:</p> <ul style="list-style-type: none"> <li>describe the anatomical basis of clinical disorder of thorax, abdomen.</li> </ul>	<p><b><i>Thorax</i></b></p> <ul style="list-style-type: none"> <li>Pleurisy / Pleural effusion</li> <li>Pneumothorax</li> <li>Coronary artery disease</li> <li>Pericarditis/ pericardial effusion</li> <li>Flail chest</li> <li>Paralysis of the diaphragm</li> </ul> <p><b><u>Abdomen</u></b></p> <ul style="list-style-type: none"> <li>Portal vein obstruction</li> <li>Hydrocele</li> <li>Hernia</li> <li>Peritonitis, ascitis</li> <li>Gastric ulcer</li> <li>Duodenal ulcer</li> <li>Gall stone/cholecystitis</li> <li>appendicitis</li> <li>Benign hyperplasia of prostate, Prostatic cancer</li> <li>Cystocele</li> <li>Stress incontinence</li> <li>Rupture urethra</li> <li>Salphingitis</li> <li>Ectopic pregnancy</li> <li>Prolapse of uterus / vagina</li> <li>Haemorrhoids</li> <li>Undescended testis</li> <li>Psoas abscess</li> <li>Ischiorectal abscess</li> </ul>	

Learning Objectives	Contents	Teaching hours
<p><b><i>Clinical Anatomy</i></b> Students will be able to:</p> <ul style="list-style-type: none"> <li>describe the anatomical basis of clinical disorder of Head &amp; Neck, CNS &amp; Extremities</li> </ul>	<p><b><u>Head &amp; Neck</u></b></p> <ul style="list-style-type: none"> <li>Fracture of the skull bones</li> <li>Scalp injury</li> <li>Piriform fossa and foreign body</li> <li>Otitis media</li> <li>Sinusitis</li> <li>Epistaxis</li> <li>Tonsillitis</li> <li>Swelling of thyroid gland</li> <li>Mumps</li> <li>Cavernous vein thrombosis</li> <li>Cervical rib</li> </ul> <p><b><u>CNS &amp; Eyeball</u></b></p> <ul style="list-style-type: none"> <li>Injury to brain /eye ball / spinal cord/cranial nerves</li> <li>Meningitis</li> <li>Hydrocephalus</li> <li>Cerebral ischaemia</li> <li>intracranial haemorrhage (extradural,subarachnoid, cerebral) papilledema Horner syndrome</li> </ul> <p><b><u>Superior extremity</u></b></p> <ul style="list-style-type: none"> <li>Dislocation of shoulder joint</li> <li>Brachial plexus &amp; injury to its nerves</li> <li>Carpal tunnel syndrome</li> <li>Colle's fracture</li> <li>Breast abscess &amp; breast cancer</li> </ul> <p><b><u>Inferior extremity</u></b></p> <ul style="list-style-type: none"> <li>Varicose vein</li> <li>Deep vein thrombosis</li> <li>Nerve injury</li> <li>Dislocation of hip joint</li> <li>Rupture of menisci &amp; cruciate ligament,Bursitis</li> <li>Deformities of foot</li> </ul>	

Learning Objectives	Contents	Teaching hours
<p><b><i>Clinical Anatomy</i></b>  Students will be able to:</p> <ul style="list-style-type: none"> <li>• describe the anatomical basis for selection of arteries ,veins &amp; Muscles of clinical importance.</li> <li>• demonstrate the different auscultatory areas</li> <li>• describe the anatomical basis for clinical procedure of Thorax, Abdomen, Head &amp; Neck , CNS &amp; Eyeball Extremities</li> </ul>	<ul style="list-style-type: none"> <li>• Arterial pulsation</li> <li>• Intravenous injections</li> <li>• Intramuscular injection</li> <li>• Apex beat, mitral ,tricuspid, aortic &amp; pulmonary areas</li> <li>• Sternal puncture</li> <li>• Pleural effusion</li> <li>• pericardial effusion</li> <li>• Coronary angiogram</li> <li>• Bronchoscopy</li> <li>• Laryngoscopy</li> <li>• Paracentesis /peritoneal dialysis</li> <li>• Liver abscess</li> <li>• Vasectomy</li> <li>• Tubal ligation</li> <li>• Nasogastric intubation</li> <li>• Palpation of Cervical lymph node</li> <li>• Lumbar puncture</li> <li>• Epidural/spinal anaesthesia</li> <li>• Pudendal block</li> <li>• Fundoscopy</li> </ul>	



## Regional Anatomy : THORAX CARD (DISSECTION, DEMONSTRATION & TUTORIAL)

Learning Objectives	Contents	Teaching hours
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• demonstrate the boundary &amp; identify the contents of thoracic wall, thoracic cavity mediastinum &amp; inter costal space</li> <li>• identify &amp; demonstrate the gross features of bones &amp; joints of thorax</li> <li>• describe the formation , course ,branches &amp; distribution of Spinal nerve / intercostal nerve</li> <li>• identify &amp; demonstrate the surfaces, borders, parts, chambers- including structures within the chambers of the heart</li> <li>• explain blood supply &amp; nerve supply of heart</li> <li>• identify &amp; demonstrate the layers of pericardium</li>   <li>• identify &amp; demonstrate the surfaces, borders, fissures, lobes, hilus &amp; bronchopulmonary units of the lung</li> <li>• identify &amp; demonstrate the layers &amp; parts of pleura.</li> <li>• explain the blood supply, lymphatic drainage &amp; nerve supply of lung &amp; pleura.</li> <li>• identify &amp; demonstrate the trachea bronchus &amp; bronchial tree.</li> <li>• explain blood supply &amp; nerve supply of trachea &amp; bronchial tree.</li> <li>• explain the blood supply, nerve supply &amp; lymphatic drainage of thoracic wall.</li> <li>• identify &amp; demonstrate the surfaces, parts openings, attachments of the diaphragm.</li> <li>• explain the blood supply &amp; nerve supply of the diaphragm.</li> <li>• explain the significance of the orifices of the diaphragm.</li> <li>• explain &amp; demonstrate the extension ,parts ,relations &amp; constrictions of oesophagus</li> <li>• explain the blood supply, lymphatic drainage &amp; nerve supply of the oesophagus.</li>   <li>• correlate clinical conditions associated with structures of thorax (Heart with its vessels, lung, trachea, bronchus, bronchial tree &amp; the Diaphragm)</li> </ul>	<ul style="list-style-type: none"> <li>• Thoracic wall formation, thoracic cavity, intercostal space and mediastinum.</li> <li>• Bones and joints of the thorax</li> <li>• Spinal nerve / intercostal nerve</li>   <li>• Heart with pericardium.</li>   <li>• Lung with pleura, trachea and bronchus.</li>   <li>Blood vessels, nerves and lymphatics of the thorax.</li> <li>• The diaphragm.</li>   <li>• oesophagus</li>   <li>• Clinical Anatomy</li> </ul>	<p>49 hrs.</p>

## Regional Anatomy: SUPERIOR EXTREMITY CARD (DISSECTION, DEMONSTRATION & TUTORIAL)

Learning Objectives	Contents	Teaching hours
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• identify &amp; demonstrate muscles, vessels, nerves of pectoral region including attachment of muscles</li> <li>• describe the parts of mammary gland &amp; its blood supply, lymphatic drainage &amp; nerve supply</li> <li>• demonstrate the boundary &amp; identify the contents of axilla, Quadrangular &amp; triangular spaces, &amp; cubital fossa</li> <li>• demonstrate the attachments of muscles, and identify vessels, nerves, lymphatics &amp; lymph nodes of different parts of superior extremity</li> <li>• demonstrate the gross features of bones &amp; joints of superior extremity and muscles acting on joints</li> <li>• correlate clinical conditions associated with structures (nerves, vessels, bones, joints) of superior extremity</li> </ul>	<ul style="list-style-type: none"> <li>• Pectoral region with mammary gland</li> <li>• Axilla</li> <li>• Superficial dissection of the upper limb, back and scapular region including quadrangular &amp; triangular space</li> <li>• Front of the arm , forearm and palm</li> <li>• Back of the arm, forearm and dorsum of the hand</li> <li>• Blood supply, lymphatic drainage, cutaneous innervation &amp; dermatome of superior extremity</li> <li>• Bones &amp; joints of the upper limb</li> <li>• Removal of the limb</li> <li>• Clinical Anatomy</li> </ul>	<p>42 hrs.</p>

**Regional Anatomy: ABDOMEN CARD  
(DISSECTION, DEMONSTRATION & TUTORIAL)**

Learning Objectives	Contents	Teaching hours
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• demonstrate the different layers of anterior abdominal wall &amp; hernial region</li> <li>• explain clinical types of hernia</li> <li>• demonstrate the different parts of GI Tract &amp; its peritonium</li> <li>• explain their mode of blood supply, lymphatic drainage &amp; nerve supply</li> <li>• demonstrate the features of liver, pancreas, supra renal gland &amp; different parts of biliary system</li> <li>• explain blood supply, lymphatic drainage &amp; nerve supply of them.</li> <li>• demonstrate the features of kidney, ureter, urinary bladder, &amp; urethra</li> <li>• explain their blood supply, lymphatic drainage &amp; nerve supply</li> <li>• demonstrate the features of different parts of male &amp; female reproductive system.</li> <li>• explain their blood supply, lymphatic drainage &amp; nerve supply.</li> <li>• demonstrate the muscles and identify the vessels, nerves &amp; lymphatics of posterior abdominal wall</li> <li>• demonstrate the parts and identify the contents of the pelvis</li> <li>• differentiate between male &amp; female pelvis</li> <li>• demonstrate the gross features &amp; joints of lumbar vertebra &amp; bony pelvis and muscles acting on joints</li> <li>• correlate with clinical conditions associated with different organs of the abdomen</li> </ul>	<ul style="list-style-type: none"> <li>• Anterior wall of the abdomen with hernial region.</li> <li>• Stomach, abdominal part of the oesophagus; coeliac artery.</li> <li>• Duodenum, pancreas and spleen.</li> <li>• The mesentery and mesenteric vessels, jejunum and ileum.</li> <li>• Large intestine. rectum &amp; anal canal</li> <li>• Liver with the biliary apparatus including gall bladder; portal vein.</li> <li>• Kidney, suprarenal gland and ureter.</li> <li>• Muscles, blood vessels, lymphatics and nerves of the posterior abdominal wall.</li> <li>• Muscles, blood vessels lymphatics, nerves and the pelvis; urinary bladder.</li> <li>• Ovary, uterus, uterine tube, female external organs and perineum.</li> <li>• Vas deferens, seminal vesicle, prostate and male external genital organs.</li> <li>• Lumbar vertebra, bony pelvis &amp; joints</li> <li>• Clinical Anatomy</li> </ul>	<p>103 hrs.</p>

**Regional Anatomy: INFERIOR EXTREMITY CARD  
(DISSECTION, DEMONSTRATION & TUTORIAL)**

Learning Objectives	Contents	Teaching hours
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• demonstrate muscles attachments and identify vessels &amp; nerves of different parts of inferior extremity</li> <li>• demonstrate the boundary and identify the contents of femoral triangle, adductor canal, popliteal fossa &amp; sole of the foot</li> <li>• demonstrate the features of bones, joints, &amp; muscles acting on joints</li> <li>• explain the Venous drainage, lymphatic drainage, &amp; dermatome of inferior extremity</li> <li>• correlate the clinical conditions associated with structures (nerves, vessels, bones, joints) of inferior extremity</li> </ul>	<ul style="list-style-type: none"> <li>• Front and medial side of the thigh</li> <li>• Gluteal region and back of the thigh</li> <li>• Front of the leg and dorsum of the foot</li> <li>• Lateral side, medial side and back of the leg including the popliteal fossa sole of the foot</li> <li>• Bones &amp; joints of lower limb</li> <li>• Arches of the foot</li> <li>• Removal of lower limb</li> <li>• Blood supply, lymphatic drainage, cutaneous innervation &amp; dermatome of inferior extremity</li> <li>• Clinical Anatomy</li> </ul>	<p>41 hrs.</p>

**Regional Anatomy: HEAD & NECK CARD  
(DISSECTION, DEMONSTRATION & TUTORIAL)**

Learning Objectives	Contents	Teaching hours
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• identify and demonstrate the different parts of bones of head &amp; neck , joints, &amp; muscles acting on joints</li> <li>• state the gross features &amp; attachments of skull bones including base of skull &amp; cervical vertebrae.</li> <li>• demonstrate movements of joints of Head &amp; Neck</li> <li>• demonstrate the layers of scalp identify the contents of temporal region</li> <li>• demonstrate the boundary of face and identify muscles and sensory supply of face</li> <li>• identify parotid gland &amp; duct &amp; explain the structures within the parotid gland</li> <li>• demonstrate the boundary and identify contents of anterior triangle, posterior triangle, sub-occipital triangle &amp; sub-mandibular region</li> <li>• demonstrate the boundary and identify contents of mouth cavity</li> <li>• demonstrate the gross features &amp; nerve supply of tongue</li> <li>• explain Auditory pathway ( VIII – cranial nerve)</li> <li>• demonstrate the parts of pharynx with their extension &amp; muscles of pharynx</li> <li>• the walls of nose and paranasal air sinuses</li> <li>• the extension, cartilages &amp; muscles of larynx</li> <li>• identify structures present in the internal surface of the larynx</li> <li>• demonstrate the region of vertebral column and attachments of muscles of the back</li> <li>• demonstrate the different parts of external, middle &amp; internal Ear</li> <li>• correlate important clinical conditions associated with structures in Head &amp; Neck (Thyroid gland, parathyroid gland, air sinuses, Larynx, scalp, ear, face etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Bones &amp; joints of head and neck</li> <li>• Scalp and temporal region</li> <li>• Face and orbit</li> <li>• Anterior triangle and submandibular region including thyroid gland</li> <li>• Posterior triangle</li> <li>• Mouth and tongue</li> <li>• Pharynx</li> <li>• Nose and paranasal sinuses</li> <li>• Larynx</li> <li>• Vertebral column and deep dissection of the</li> <li>• Organs of hearing and equilibrium.</li> <li>• Clinical Anatomy</li> </ul>	<p>88 hrs.</p>

**Regional Anatomy: CENTRAL NERVOUS SYSTEM & EYEBALL CARD  
(DISSECTION, DEMONSTRATION & TUTORIAL)**

Learning Objectives	Contents	Teaching hours
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• demonstrate               <ul style="list-style-type: none"> <li>□ the boundary &amp; contents of cranial cavity &amp; orbit</li> <li>□ the different parts of brain &amp; cranial nerves attached to brain</li> <li>□ the layers of meninges- Pia, arachnoid, and durameter</li> </ul> </li> <li>• explain the processes of dura &amp; its contents</li> <li>• explain the blood supply &amp; nerve supply of the meninges</li> <li>• demonstrate the boundary of different lobes of cerebrum, sulci, gyri &amp; important functional areas</li> <li>• explain the blood supply of cerebrum including the formation of Circle Willis</li> <li>• demonstrate the parts &amp; describe the functions &amp; connections of               <ul style="list-style-type: none"> <li>□ diencephalon, pituitary gland, basal nuclei,</li> <li>□ internal capsule, extra pyramidal system &amp;</li> <li>□ limbic system, brain stem</li> </ul> </li> <li>• locate &amp; describe               <ul style="list-style-type: none"> <li>• the nuclei, course, functional components &amp; distribution of cranial nerves</li> <li>• the boundary &amp; parts of ventricles circulation of CSF through ventricles</li> <li>• gross features of spinal cord and its meninges and spinal nerves attached to it</li> <li>• the coats of eyeball &amp; the course of optic nerve</li> </ul> </li> <li>• explain Refractive Media</li> </ul> <p>explain the effects of lesion and loss of blood supply to different parts of nervous system.</p>	<ul style="list-style-type: none"> <li>• Introduction to the nervous system, cranial cavity and orbit.</li> <li>• General examination of the brain</li> <li>• Superficial attachments of cranial nerves</li> <li>• meninges of the brain</li> </ul> <p>Cerebrum.:lobes of cerebrum, sulci gyri &amp; important functional areas blood supply formation of Circle Willis.</p> <p>Diencephalon:Thalamus, hypothalamus, metathalamus, epithalmus and pituitary gland</p> <ul style="list-style-type: none"> <li>• Basal nuclei, internal capsule, extra pyramidal system and limbic system</li> <li>• Brain stem and reticular formation</li> <li>• Cranial nerves</li> <li>• Ventricles and cerebrospinal fluid Spinal cord &amp; spinal nerves</li> <li>• Visual apparatus including the eyeball</li> <li>• Clinical Anatomy.</li> </ul>	<p>40 hrs</p>

## Cell Biology & Histology Tutorial & Practical (Card I)

Learning Objectives	Contents	Teaching hours
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• demonstrate different parts of microscope &amp; how to handle it</li> <li>• state the principles of tissue preparation</li> <li>• explain cell division</li> <li>• identify different types of tissue on slide under microscope</li> </ul>	<ul style="list-style-type: none"> <li>• Microscope: Parts &amp; how to handle Principles of different types of microscopy</li> <li>• Principles of tissue preparation and staining: Fixation, embedding, sectioning &amp; routine staining</li> <li>• Cell and cell division</li> <li>• Epithelium: Simple squamous, cuboidal, columnar Pseudo stratified Stratified squamous, cuboidal Stratified columnar Transitional</li> <li>• Connective tissue: General, special ,bone, cartilage</li> <li>• Muscular tissue: Smooth, skeletal &amp; cardiac muscle</li> <li>• Nervous tissue in general</li> </ul>	<p style="text-align: center;">17 hrs.</p>

## Cell Biology & Histology Tutorial & Practical (Card II)

Learning Objectives	Contents	Teaching hours
<ul style="list-style-type: none"> <li>• Students will be able to identify different structures of the following systems on slides under microscope:               <ul style="list-style-type: none"> <li>Respiratory system.</li> <li>Cardiovascular system</li> <li>Digestive system and &amp; associated Glands.</li> <li>Urinary system</li> <li>Male reproductive system and associated glands</li> <li>female reproductive system and associated glands</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Respiratory system Larynx, trachea, bronchial tree and Lung</li> <li>• Large artery, medium sized artery, large vein</li> <li>• Digestive system &amp; associated glands Tongue, pharynx, oesophagus, stomach, small intestine &amp; large intestine (including vermiform appendix) Liver and gall bladder, Pancreas</li> <li>• Urinary system Kidney, ureter, urinary bladder, urethrae</li> <li>• Male reproductive system and associated glands Testis, epididymis, vas deferens, seminal vesicle, prostate</li> <li>• Female reproductive system and associated glands Ovary, fallopian tube, uterus, vagina</li> <li>• Mammary gland , placenta</li> </ul>	17hrs.



## Cell Biology & Histology Tutorial & Practical (Card III)

Learning Objectives	Contents	Teaching hours
<ul style="list-style-type: none"> <li>• Students will be able to identify following structures on slides under microscope:               <ul style="list-style-type: none"> <li>Lymphatic system</li> <li>Salivary glands</li> <li>Nervous system</li> <li>Endocrine system</li> <li>Special sense organs</li> <li>Skin</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lymphatic system Lymph node, tonsil, spleen &amp; thymus</li> <li>• Exocrine glands (salivary glands)</li> <li>• Nervous system spinal cord, cerebrum, cerebellum, peripheral nerve (including the optic nerve)</li> <li>• Endocrine gland (Pituitary, Thyroid, Parathyroid, Adrenal and Islet's of Langerhans)</li> <li>• Special sense organs: Eyeball (cornea, retina), internal ear</li> <li>• Thick skin &amp; thin skin</li> </ul>	18 hrs.

## Integrated Teaching in Anatomy

- Integrated teaching program on a particular topic/organ /organ system should be organized in each term. The topics which are related should be prepared after discussion with the teachers of Anatomy/Physiology/Biochemistry. The horizontal process of Integrated teaching program will help the students to have a simultaneous views of different aspects of Anatomical/Physiological/Biochemical details of a particular topic/organ /organ system.

TOPICS	LEARNING OBJECTIVES	TERM	DEPARTMENT
1. Cell	Students will be able to <ul style="list-style-type: none"> <li>• describe the structure &amp; functions of different constituents of cell</li> <li>• explain membrane transport, membrane potentials &amp; action potentials</li> <li>• state the composition of ECF &amp; ICF compartments</li> </ul>	I	Anatomy Physiology Biochemistry
2.Heart	Students will be able to <ul style="list-style-type: none"> <li>• describe the gross anatomy &amp; clinical anatomy of heart</li> <li>• describe the types &amp; regulation of blood pressure</li> <li>• describe the physiologic basis of shock management</li> <li>• describe &amp; interpret the cardiac markers</li> </ul>	I	Anatomy Physiology Biochemistry
3.Lung	Students will be able to <ul style="list-style-type: none"> <li>• describe the gross anatomy &amp; clinical anatomy of lung</li> <li>• describe the spirometry &amp; its clinical application</li> <li>• describe the regulation of respiration</li> </ul>	I	Anatomy Physiology Biochemistry
4. Hepatobiliary system	Students will be able to <ul style="list-style-type: none"> <li>• describe the gross anatomy &amp; clinical anatomy of hepatobiliary system</li> <li>• interpret the liver function test &amp; explain its clinical importance</li> <li>• explain the role of liver in metabolism</li> </ul>	II	Anatomy Physiology Biochemistry

TOPICS	LEARNING OBJECTIVES	TERM	DEPARTMENT
5.Kidney	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• describe the gross anatomy &amp; clinical anatomy of kidney</li> <li>• explain the mechanism of urine formation</li> <li>• interpret e kidney function test</li> <li>• explain the renal chemistry in relation to water, electrolytes &amp; acid base balance</li> </ul>	II	Anatomy Physiology Biochemistry
6.Pancreas	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• describe the gross anatomy &amp; clinical anatomy of pancreas</li> <li>• describe hormones of islets of Langerhan' s</li> <li>• describe functions ,mechanism of action &amp; regulations of secretion of insulin</li> <li>• describe causes &amp; consequences of hyper &amp; hypoglycaemia</li> <li>• describe laboratory diagnosis of diabetes mellitus</li> </ul>	II	Anatomy Physiology Biochemistry
7.Adrenal gland	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• describe the gross anatomy &amp; clinical anatomy of adrenal gland</li> <li>• describe the functions ,mechanism of action &amp; regulation of secretion of adrenal hormones</li> <li>• describe hypo &amp; hyperadrenalism</li> </ul>	III	Anatomy Physiology Biochemistry
8. Thyroid & Parathyroid gland	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• describe the gross anatomy &amp; clinical anatomy of thyroid &amp; parathyroid gland</li> <li>• describe the hormones of thyroid &amp; parathyroid gland : biosynthesis , transport functions ,mechanism of action &amp; regulation of secretion</li> <li>• describe hypo &amp; hyperthyroidism</li> <li>• describe tetany</li> <li>• describe thyroid function tests &amp; their interpretation</li> </ul>	III	Anatomy Physiology Biochemistry
9. Pituitary gland	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• describe the gross anatomy &amp; clinical anatomy of pituitary gland</li> <li>• describe Hormones of pituitary gland : functions ,mechanism of action &amp; regulation of secretion</li> <li>• describe Hypo &amp; hyperpituitarism</li> </ul>	III	Anatomy Physiology Biochemistry

TOPICS	LEARNING OBJECTIVES	TERM	DEPARTMENT
10. Sensory system & Motor system	Students will be able to <ul style="list-style-type: none"> <li>• describe receptors ,synapse &amp; sensory pathways</li> <li>• describe the pyramidal and extrapyramidal system</li> <li>• describe cerebellum, basal nuclei &amp; their disorder</li> <li>• describe the different types of neurotransmitter &amp; their functions</li> </ul>	III	Anatomy Physiology Biochemistry

## Teaching - Learning & Assessment Methods

<i>Teaching / Learning Method</i>	<i>Teaching Aid</i>	<i>In Course Assessment</i>	<i>Summative Assessment</i>
Lecture	Computer & multimedia Slide projector, overhead projector (OHP), black board white and different colour chalk, white board and different colour white board markers.	<ul style="list-style-type: none"> <li>• Item Examination: Oral, Practical</li> <li>• Card Completion Examination</li> <li>• Term Examinations: Written, Oral, Practical</li> <li>• Preparation of exercise book</li> </ul>	<ul style="list-style-type: none"> <li>• Written</li> <li>• Oral</li> <li>• Practical</li> </ul>
Regional Anatomy: Demonstration & Tutorial	Cadavers, prosected parts, bones, viscera and other specimens of body parts, models, charts, black board white and different colour chalk, white board and different colour white board markers, Illustration sheets/posters, OHP, video, slide projector, computer with CD ROM, radiographs & other images.		
Regional Anatomy: Dissection	Cadavers, prosected parts, specimens and bones, black board white and different colour chalk, white board and different colour white board markers, Computer & multimedia.		
Cell Biology & Histology Tutorial & Practical	Microscope, slide projector, black board white and different colour chalk, white board and different colour white board markers, OHP, Illustration sheets (including photomicrographs & drawings)/posters, video projector, computer with CD ROM drive		

## Assessment in Anatomy

Component	Marks	Total Marks
<b>Formative assessment</b>	<b>10+10</b>	<b>20</b>
<b>WRITTEN EXAMINATION</b>		
<b>paper-I-</b> MCQ	<b>20</b>	<b>180</b>
SAQ	<b>70</b>	
<b>paper-II-</b> MCQ	<b>20</b>	
SAQ	<b>70</b>	
<b>ORAL EXAMINATION (Structured)</b>		
<b>Hard part</b>	<b>75</b>	<b>150</b>
<b>Soft part</b>	<b>75</b>	
<b>PRACTICAL EXAMINATION</b>		
<b>Soft part</b>		
Objective structured practical Exam (OSPE)	<b>30</b>	<b>75</b>
Dissection	<b>30</b>	
Anatomy of Radiology and imaging	<b>15</b>	
<b>Hard part</b>		
OSPE	<b>30</b>	<b>75</b>
Lucky slides	<b>20</b>	
Living Anatomy	<b>20</b>	
Practical Khata	<b>05</b>	
<b>Grand Total</b>		<b>500</b>

- There will be separate Answer Scripts for SAQ
- Pass marks 60 % in each of theoretical, oral and practical examination

## Time allocation in Anatomy

### Lecture & Review - 115 hours

Term	General Anatomy Hours	Cell Biology Hours	General Histology Hours	Systemic Histology Hours	General Embryology Hours	Systemic Embryology Hours	Neuro anatomy Hours.	Human Genetics Hours.	Total Hours
First Term	12	06	08	02	13	-	01	04	<b>46</b>
Second Term	-	-	02	14	05	17	02	-	<b>40</b>
Third Term	-	-	02	02	-	07	18	-	<b>29</b>
<b>Grand Total Hours (Class +Exam)</b>	<b>12</b>	<b>06</b>	<b>12</b>	<b>18</b>	<b>18</b>	<b>24</b>	<b>21</b>	<b>04</b>	<b>115</b>

### Cell Biology & Histology - Tutorial & Practical – 52 hours

Term	Class Hours (Including Item Exam hrs)	Card Completion Exam Hours	Total Hours
First Term (Card I)	15	2	17
Second Term (Card II)	15	2	17
Third Term (Card III)	16	2	18
<b>Grand Total Hours</b>	<b>46</b>	<b>6</b>	<b>52</b>

Term	Cards	Dissection & Demonstration	Tutorial Review			Part Completion Examination Hours	Total Hours
			Living (surface) Anatomy	Anatomy of radiology & Images	Clinical Anatomy		
First Term	Thorax	32	6	2	3	06	49
	Superior Extremity	33	3	2	3	01	42
Second Term	Abdomen	83	6	2	6	06	103
	Inferior Extremity	33	3	2	2	01	41
Third Term	Head, Neck	74	4	2	3	05	88
	Central Nervous system and Eye ball	35	00	1	3	01	40
Grand Total Hours		290	22	11	20	20	363



## ACADEMIC CALENDAR for ANATOMY

<i>Class/Exam</i>	<i>Hours (including Class exams hrs)</i>	<i>First Term (14 working weeks)</i>	<i>Second Term (15 working weeks)</i>	<i>Third Term (14 working weeks)</i>
Lecture and Review	115	<ul style="list-style-type: none"> <li>• General Anatomy-12 hrs</li> <li>• Cell Biology -06 hrs</li> <li>• Human Genetics - 04 hrs</li> <li>• General Histology-08 hr</li> <li>• Systemic Histology – 02 hrs</li> <li>• General Embryology - 13 hrs</li> <li>• Neuroanatomy – 01 hrs</li> </ul>	<ul style="list-style-type: none"> <li>• General Histology-02 hr</li> <li>• Systemic Histology - 14 hrs</li> <li>• General Embryology - 05 hrs</li> <li>• Systemic Embryology- 17 hrs</li> <li>• Neuroanatomy – 02 hrs</li> </ul>	<ul style="list-style-type: none"> <li>a) General histology - 02 hr</li> <li>b) Systemic Histology -02 hrs</li> <li>c) Systemic Embryology - 07 hrs</li> <li>d) Neuroanatomy - 18hrs</li> </ul>
Tutorial/ Review	53	Thorax Card – 11 hrs Sup. Ext. Card – 08 hrs	Abdomen Card – 14 hrs Inf. Ext. Card – 7 hrs	Head & Neck Card –9 hrs C.N.S & Eyeball – 04 hrs
Dissection	290	Thorax Card - 32 hrs Sup Ext Card- 33 hrs	Abdomen Card – 83hrs Inf. Ext. Card – 33 hrs	Head & Neck Card – 74 hrs C.N.S & Eyeball Card - 35 hrs
Card Completion Exam	20	Thorax Card- 06hrs Sup Ext. Card- 01hrs	Abdomen Card– 06 hrs Inf. Ext. Card – 01 hrs	Head & Neck Card –05 hrs C.N.S & Eyeball Card - 01 hrs
Cell Biology & Histology- Tutorial/ Practical	52	Card I – 17 hrs	Card II - 17 hrs	Card III – 18 hrs
<b>Grand Total</b>	<b>530</b>			

Evaluation & leave 04 weeks

Evaluation & leave 04 weeks

2.Evaluation & preparatory leave for first prof-08 weeks  
1.Evaluation & preparatory leave for third term:03 weeks

N.B. – Card completion examinations will be arranged on discussion with other departments (Physiology, Biochemistry)

Prerequisite for 1<sup>st</sup> professional examination

1. A Student must pass all term exam before appearing 1<sup>st</sup> professional exam.
2. Class attendance must be 75 %

**DEPARTMENT OF ANATOMY**

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**THORAX CARD**

**(ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)**

<b>Year</b>	
<b>Session</b>	
<b>Roll No.</b>	
<b>Batch</b>	

<b>Card no.</b>	
<b>Cadaver no.</b>	
<b>Total marks</b>	
<b>Pass marks</b>	

<b>Name of the student</b>				
<b>Period of placement</b>	<b>From :</b>		<b>To :</b>	

<b>Part for dissection (item)</b>	<b>Date of beginning</b>	<b>Date of examination</b>	<b>Marks obtained</b>	<b>Remarks and Signature of the Lecturer</b>
1.Thoracic wall, Intercostal space, thoracic cavity and mediastinum.				
2.Bones and joints of the thorax				
3.Heart with pericardium.				
4.Lung, Pleura , trachea and bronchus.				
5.The Diaphragm & oesophagus				
6.Blood vessels, nerves and lymphatics of the thorax.				
7. Clinical & Functional anatomy				
8. Living Anatomy.				
9.Anatomy of Radiology & Images				

<b>No. of attendance in the practical classes of the card</b>		<b>Out of</b>	
<b>Mark obtained</b>			
<b>Remarks</b>			
<b>Signature of the Lecturer</b>			
<b>Signature of Head of the Department</b>			

**DEPARTMENT OF ANATOMY**  
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**SUPERIOR EXTREMITY CARD**  
**(ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)**

<b>Year</b>		<b>Card no.</b>	
<b>Session</b>		<b>Cadaver no.</b>	
<b>Roll No.</b>		<b>Total marks</b>	
<b>Batch</b>		<b>Pass marks</b>	
<b>Name of the student</b>			
<b>Period of placement</b>	<b>From :</b>		<b>To :</b>

Part for dissection (item)	Date of beginning	Date of examination	Marks obtained	Remarks and Signature of the Lecturer
1. Bones and introduction to the joints of the superior extremity				
2. Pectoral region with mammary gland.				
3. Axilla.				
4. Superficial dissection of the upper limb, back and scapular region.				
5. Front of the arm , forearm & palm				
6 .Back of the arm, forearm & dorsum of the hand.				
7. Blood vessels, nerves and lymphatics of the superior extremity				
8. Removal of the limb; shoulder joint, acromioclavicular joint, elbow joint, wrist joint				
9. Clinical & Functional Anatomy.				
10. Living Anatomy				
11. Anatomy of Radiology & Images				

<b>No. of attendance in the practical classes of the card</b>		<b>Out of</b>	
<b>Mark obtained</b>			
<b>Remarks</b>			
<b>Signature of the Lecturer</b>			
<b>Signature of Head of the Department</b>			

**DEPARTMENT OF ANATOMY**  
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**ABDOMEN CARD**

(ITME EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)

<b>Year</b>	
<b>Session</b>	
<b>Roll No.</b>	
<b>Batch</b>	

<b>Card no.</b>	
<b>Cadaver no.</b>	
<b>Total marks</b>	
<b>Pass marks</b>	

<b>Name of the student</b>			
<b>Period of placement</b>	<b>From</b>		<b>To :</b>

Part for dissection (item)	Date of beginning	Date of examination	Mark obtained	Remarks and Signature of the Lecturer
1.Bones and joints of abdomen & pelvis				
2.Anterior wall of the abdomen with hernial region.				
3.Stomach, abdominal part of the oesophagus; coeliac trunk				
4.Duodenum, pancreas and spleen.				
5.The mesentery and mesenteric vessels, jejunum and ileum.				
6.Large intestine.				
7. Rectum and anal canal				
8..Liver with the biliary apparatus including gall bladder; portal vein.				
9.Kidneys, suprarenal gland, ureters. urinary bladder ,Urethrae				
10.Muscles, blood vessels, lymphatics and nerves of the posterior abdominal wall.				
11.Muscles, blood vessels, lymphatics, nerves of the pelvis				
12.Ovaries, uterus, uterine tubes,vagina,female external genital organs and perineum.				
13.Perineum pelvic diaphragm.urogenital diaphragm,perineal pouches,ischiorectal fossa				
14.Vas deferens, seminal vesicles, prostate,testes and male external genital organs.				
15.Clinical & Functional anatomy				
16.Living Anatomy.				
17Anatomy of Radiology & Images				

<b>No. of attendance in the practical classes of the card</b>		<b>Out of</b>	
<b>Mark obtained</b>			
<b>Remarks</b>			
<b>Signature of the Lecturer</b>			
<b>Signature of Head of the Department</b>			

**DEPARTMENT OF ANATOMY**  
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**INFERIOR EXTREMITY CARD**  
 (ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)

<b>Year</b>	
<b>Session</b>	
<b>Roll No.</b>	
<b>Batch</b>	

<b>Card no.</b>	
<b>Cadaver no.</b>	
<b>Total marks</b>	
<b>Pass marks</b>	

<b>Name of the student</b>			
<b>Period of placement</b>	<b>From :</b>		<b>To :</b>

<b>Part for dissection (item)</b>	<b>Date of beginning</b>	<b>Date of examination</b>	<b>Marks obtained</b>	<b>Remarks and Signature of the Lecturer</b>
1. Bones and introduction to the joints of the inferior extremity				
2. Front and medial side of the thigh.				
3. Gluteal region and back of the thigh.				
4. Hip joint and removal of the lower limb.				
5. Front of the leg and dorsum of the foot.				
6. Lateral side, medial side and back of the leg including the popliteal fossa.,Sole of the foot				
7. Blood vessels, nerves and lymphatics of the inferior extremity				
8. Knee, tibiofibular joints and ankle joint				
9. Joints and arches of the foot.				
10. Clinical & Functional Anatomy.				
11. Living Anatomy				
12. Anatomy of Radiology & Images				

<b>No. of attendance in the practical classes of the card</b>		<b>Out of</b>	
<b>Mark obtained</b>			
<b>Remarks</b>			
<b>Signature of the Lecturer</b>			
<b>Signature of Head of the Department</b>			

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**HEAD AND NECK CARD**  
 (ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)

<b>Year</b>	
<b>Session</b>	
<b>Roll No.</b>	
<b>Batch</b>	

<b>Card no.</b>	
<b>Cadaver no.</b>	
<b>Total marks</b>	
<b>Pass marks</b>	

<b>Name of the student</b>				
<b>Period of placement</b>	<b>From :</b>		<b>To :</b>	

<b>Part for dissection (item)</b>	<b>Date of beginning</b>	<b>Date of examination</b>	<b>Mark obtained</b>	<b>Remarks and Signature of the Lecturer</b>
1. Bones of head and neck.				
2. Joints of head and neck.				
3. Scalp and temporal region.				
4. Face and orbit.				
5. Anterior triangle and submandibular region.				
6. Posterior triangle.				
7. Mouth and tongue.				
8. Pharynx.				
9. Nose and Paranasal sinuses.				
10. Larynx.				
11. Vertebral column and deep dissection of the back.				
12. Blood vessels, nerves and lymphatics of the Head & Neck				
13. Exocrine & Endocrine Glands of Head & neck				
14. Organs of hearing and equilibrium.				
15. Clinical & Functional Anatomy.				
16. Living Anatomy.				
17. Anatomy of Radiology & Images.				

<b>No. of attendance in the practical classes of the card</b>		<b>Out of</b>	
<b>Mark obtained</b>			
<b>Remarks</b>			
<b>Signature of the Lecturer</b>			
<b>Signature of Head of the Department</b>			

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**CENTRAL NERVOUS SYSTEM AND EYEBALL CARD**  
**(ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)**

<b>Year</b>	
<b>Session</b>	
<b>Roll No.</b>	
<b>Batch</b>	

<b>Card no.</b>	
<b>Cadaver no.</b>	
<b>Total marks</b>	
<b>Pass marks</b>	

<b>Name of the student</b>			
<b>Period of placement</b>	<b>From :</b>		<b>To :</b>

<b>Part for dissection (item)</b>	<b>Date of beginning</b>	<b>Date of examination</b>	<b>Mark obtained</b>	<b>Remarks and Signature of the Lecturer</b>
1. General introduction to the nervous system, cranial cavity and orbit.				
2. General examination of the brain with its nerve attachments and meninges.				
3. Cranial nerve – nuclei, course. functional components, supply & lesions				
4. Cerebrum.				
5. Diencephalon				
6. Basal ganglia, internal capsule, extra pyramidal system and limbic system.				
7. Brain stem, reticular formation & Cerebellum				
8. Ventricles and cerebrospinal fluid.				
9. Spinal cord & Spinal nerve				
10. Visual apparatus including the eyeball.				
11. Clinical & Functional Anatomy				
12. Living Anatomy.				
13. Anatomy of Radiology & Images				

<b>No. of attendance in the practical classes of the card</b>		<b>Out of</b>	
<b>Mark obtained</b>			
<b>Remarks</b>			
<b>Signature of the Lecturer</b>			
<b>Signature of Head of the Department</b>			

**DEPARTMENT OF ANATOMY**  
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**HISTOLOGY CARD NO. I**

<b>Year</b>	
<b>Session</b>	
<b>Roll No.</b>	
<b>Batch</b>	

<b>Total marks</b>	
<b>Pass marks</b>	

<b>Name of the student</b>			
<b>Period of placement</b>	<b>From :</b>		<b>To :</b>

<b>Item</b>	<b>Date of beginning</b>	<b>Date of examination</b>	<b>Marks obtained</b>	<b>Remarks and Signature</b>
1. Study of microscope.				
2. Principles of tissue preparation and staining (routine)				
3. Cell and cell division				
4. Epithelium				
5. Connective tissue-General				
6. Connective tissue-Special				
7. Muscular tissue				
8. Nervous tissue in general				

<b>Total No. of attendance</b>		<b>Out of</b>	
<b>Marks obtained</b>			
<b>Remarks</b>			
<b>Signature of the Lecturer</b>			
<b>Signature of the Prof. of Anatomy</b>			



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**HISTOLOGY CARD NO. II**

<b>Year</b>	
<b>Session</b>	
<b>Roll No.</b>	
<b>Batch</b>	

<b>Total marks</b>	
<b>Pass marks</b>	

<b>Name of the student</b>				
<b>Period of placement</b>	<b>From :</b>		<b>To :</b>	

<b>Item</b>	<b>Date of beginning</b>	<b>Date of examination</b>	<b>Marks obtained</b>	<b>Remarks and Signature</b>
1. Cardiovascular system				
2. Respiratory system				
3. Digestive system & associated glands				
4. Urinary system				
5. Male reproductive system				
6. Female reproductive system				

<b>Total No. of attendance</b>		<b>Out of</b>	
<b>Marks obtained</b>			
<b>Remarks</b>			
<b>Signature of the Lecturer</b>			
<b>Signature of the Prof. of Anatomy</b>			

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**HISTOLOGY CARD NO. III**

<b>Year</b>	
<b>Session</b>	
<b>Roll No.</b>	
<b>Batch</b>	

<b>Total marks</b>	
<b>Pass marks</b>	

<b>Name of the student</b>				
<b>Period of placement</b>	<b>From :</b>		<b>To :</b>	

<b>Item</b>	<b>Date of beginning</b>	<b>Date of examination</b>	<b>Marks obtained</b>	<b>Remarks and Signature</b>
1. Lymphatic System				
2. Exocrine Glands in general				
3. Endocrine Glands				
4. Nervous system				
5. Special sense organs				
6. Skin –Thick & Thin skin				

<b>Total No. of attendance</b>		<b>Out of</b>	
<b>Marks obtained</b>			
<b>Remarks</b>			
<b>Signature of the Lecturer</b>			
<b>Signature of the Prof. of Anatomy</b>			