Anatomy

Departmental Objectives

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

- mention, identify, show, draw and describe the anatomical structure of the human body responsible for carrying out normal body functions.
- apply the acquired knowledge to understand and correlate the other pre-clinical, para-clinical and clinical medical subjects.
- execute the acquired 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:

- Ability to demonstrate knowledge & skill of understanding human anatomy, functions of different components of human body, cell biology and human development in clinical perspective.
- Ability to utilize knowledge and skill of understanding of spatial relationship, course & distributions of different components of human in real life situation.
- Ability to detect the deviation from normal state in the human body in relation to structure, function and development.
- Ability to identify human body components and functional pattern by using internationally accepted terminologies.

Distribution of teaching - learning hours

Lecture	Tutorial	Practical (Histology)	Demonstration +Dissection +Card exam	Total Teaching hours	Integrated teaching for phase I	Formative Exam		Summative exam	
						Preparatory leave+ post term leave	Exam time	Preparatory leave	Exam time
115 hrs	53hrs	52 hrs	307 hrs	527 hrs	36 hrs	21+14= 35 days	42 days	30 days	30 days
Time for integrated teaching, examination, preparatory leave of formative & summative assessment is common for all subjects of the phase									
Related behavioral, professional & ethical issues will be discussed in all teaching learning sessions									

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 Dissection	Self-study & self-assessment	Computer / Laptop & Multimedia OHP, Transparency & Transparency marker White board & different coloured white board markers Black board & white and coloured chalks Cadavers, prosected parts, bones, viscera Histological slide, Microscope & Projection microscope Projection system and Virtual anatomy dissection table	• Item Examination • Card Examination • Term Final Examination (written, oral+ practical)

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, Simulator, various Projection system and Virtual anatomy dissection table.

1st Professional Examination:

Marks distribution of Assessment of Anatomy

Total marks – 500

- Written=200 (Formative 20+MCQ (SBA+MTF) 40+(SAQ + SEQ) 140)
- SOE = 150
- Practical=150

Learning Objectives and Course Contents in Anatomy

Learning Objectives	Contents	Teaching hours Total : 12 hrs
General Anatomy Student will be able to • define anatomy and explain the subdivisions of anatomy. • describe the anatomical terminology, planes & positions. • define and classify bone. Describe the composition, blood supply, functions, ossification of bones with clinical correlation. • describe the composition, characteristics, location and functions of different types of cartilages. • define & classify joints. Describe the characters, stability & movements of joints with clinical correlation. • classify muscles. Describe their properties and functions. • define & classify blood vessels. • describe the different types of circulation. • describe different types of vascular anastomosis with their functional & clinical implications. • describe components, functions & the general plan of lymphatic drainage of the whole body. • classify lymphoid organs. Describe the functions of lymphoid organs with clinical significance.	**TERM I** **CORE :** • Definition, subdivisions of anatomy and its importance in the study of medicine. • Anatomical terminologies, anatomical planes & positions. • Skeletal system**:** Bones – classification, composition, functions, parts of a developing long bone, blood supply, periosteum & endosteum. Ossification – definition, centres, processes. Factors affecting growth of bone. • Cartilages: composition, types, characters, locations and functions • Joint: classification, characteristics of each type & movements, stability of the joints. Clinical conditions associated with joints. General plan of blood supply & nerve supply of joints. • Muscular system: different ways of classification, characteristics and functions different types. Skeletal muscle – classification; Principle applied to innervation & contraction. • Blood vascular system: component parts, general plan, structure, classification. Differences between different types of vessel. Nutrition & innervations of vessels. Circulation – systemic, portal & pulmonary circulation and characteristic features of each type. Vascular anastomosis: types ,sites, characteristics ,functional and clinical importance • Lymph vascular system: components, characteristic features of lymph capillaries. Comparison with blood capillary. • Lymphoid organs: classification, distribution & functions,	01 hr 01 hr 03 hrs 01 hr 02 hrs 01 hr 02 hrs 01 hr

Learning Objectives	Contents	Teaching hours Total : 08 hrs
Cell Biology Student will be able to: • define and describe the human cell & its constituents, structure & functions of all components of cell. • describe the features of different types of cells.	**CORE:** • Human Cell – Basic organization, types of constituents, cell membrane • Nucleus – structure & functions • Cytoplasm, organelles and inclusions – structure & functions • Functional correlation of different types of cell (protein secreting, ion transporting, steroid secreting, mucus secreting, antibody producing cell) in respect of their nuclear, cytoplasmic, membrane and surface feature	Total:06 hrs. TERM I 02 hrs 01 hr 02 hrs 01hr
Human Genetics Students will be able to: • describe the different basic features of chromosomes. • define terms related to human genetics.	**CORE:** • Chromosomes: Basic structure • Terms & definitions: Gene, Gene locus, genome, genotype, phenotype, genetic trait etc.	**Total: 02 hrs** **TERM I** 01hr 01 hrs

Learning Objectives	Contents	Teaching hours Total: 14 hours

General Histology
Student will be able to:
• define and classify the basic tissues in the body
• identify under microscope different types of:
  • Epithelial tissue
  • Connective tissue
  • Muscular tissue
• describe microscopic components and differentiate different components of:
  • Epithelial tissue
  • Connective tissue
  • Muscular tissue
• describe the histological structures of different types of muscle tissue.
 	
• describe the composition & functions of components of nervous tissue
• correlate inter-relationship between structure and functions of each tissue
	General Histology
	Basic tissues:
	• Definition, classification, components, characters, distribution and functions of
	  • Epithelial tissue and its subtypes
	  • Connective tissue and its subtypes
	  • Muscular tissue and its subtypes
	• Structure and functions of
	  • Cell surface specialization
	  • Inter cellular junction
	
	• Histological structure of
	  • Smooth muscle tissue
	  • Cardiac muscle tissue
	  • Skeletal muscle tissue
	• Mechanism of muscle contraction
	• Structure and function of Nervous tissue
	  • Neurons
	  • Neuroglia
		TERM I
		
		05hrs
		
		05 hrs
		
		TERM II
		02 hrs
		
		TERM III
		02 hrs

Learning Objectives	Contents	Teaching hours Total: 18 hours
Systemic Histology: Students will be able to describe the histological structures of organs of different systems of the body.	***Systemic Histology*** **:** histological structures of **TERM I** • Respiratory system : Respiratory tract & Lung • Vascular system : Different types of artery, capillary & vein **TERM II** • Lymphoid organs: Thymus, spleen, lymph node & tonsil • Digestive system & associated Glands : tongue, oesophagus, stomach, intestine, Liver, gall bladder, pancreas • Exocrine glands : salivary glands • Urinary system : kidney, ureter, urinary bladder • Male reproductive system : testis, epididymis, vas deferens, seminal vesicle • Female reproductive system: ovary, uterus, uterine tube, vagina **TERM III** • Endocrine glands: pituitary, thyroid, parathyroid, adrenal glands • Skin and its appendages	 **TERM I** 01 hr 01 hr **TERM II** 02 hrs 04 hrs 01 hr 03 hr 02 hrs 02 hrs **TERM III** 01 hr 01 hr

Learning Objectives	Contents	Teaching hours Total 18hrs
General Embryology Students will be able to: • define terms related to embryology • explain the significance of study of embryology • explain basic process of development • describe different processes of cell division • describe oogenesis and spermatogenesis • describe the process of fertilization • describe the events of 1st week of development. • describe the events2nd week of development. • describe the events 3rd week of development. • describe the development & derivatives of ectoderm, mesoderm & endoderm. • explain the development of foetal membranes • explain the development of twins & their types. • describe the causes & types of congenital anomalies • explain the process of human evocation • describe the Molecular regulation & cell signaling pathways	**CORE:** • Introduction: terms and definition; Significance of study of embryology. • Basic process of development: proliferation, growth, differentiation, inductors, evocators and organizer • Cell division: Types • chromosomal changes during cell division with anomalies • Gametogenesis and maturation of Germ cells. • Fertilization: Events, factors influencing the fertilization; Progress in 1st week of development • Progress in 2nd week of development. • Progress in 3rd week of development. • Derivatives of germ layers: ectoderm, mesoderm & endoderm. • Foetal membranes : Placenta, chorion, amnion, umbilical cord, yolk sac etc. • Twins • Teratology **Additional:** • Human Evolution • Concepts of medical biotechnology in relation to embryology • Molecular regulation &cell signaling	**TERM I** 01 hr 01 hr 02 hrs 02 hrs 02 hrs 02 hr 02 hrs 01 hr **TERM II** 03 hrs 01 hrs 01 hrs

Learning Objectives	Contents	Teaching hours Total: 24 hours
Systemic Developmental Anatomy Student will be able to: • describe the process of development of different systems of the body • describe the developmental anomalies of the organs of different systems of the body • mention general outline of development of: Thoracic duct, Cisterna chyli, Inferior Vena Cava, Superior Vena Cava, Portal Vein, Brachiocephalic veins & Renal veins.	**CORE:** Development and their Anomalies of • Skeletal system & vertebral column Muscular system • Upper and lower limb • Digestive system with associated glands • Respiratory system • Cardiovascular System & aortic arches • Coelomic cavity & the diaphragm • Skin & mammary gland • Urinary system • Male and female Reproduction system • Pituitary & suprarenal gland • Face & neck & their associated organs • Nervous System • Eye & Ear **Additional:** Development of • Lymphatic System • Vascular System	**TERM II** 02 hrs 01 hr 03 hrs 01 hr 03 hrs 01 hr 01 hr 02 hrs 03 hrs **TERM III** 01 hr 03 hrs 02 hrs 01 hr

Learning Objectives	Contents	Teaching hours Total: 21 hours
Neuroanatomy Students will be able to: • classify nervous system and describe each type. • mention different parts of nervous system • describe composition of nervous system • describe autonomic nervous system, • describe the coverings of central nervous system • describe the ventricular system of CNS • explain blood brain & blood CSF barrier	**CORE:** • Introduction to Nervous system, • Composition of grey matter and white matter • Nerve fibers: structure classifications & functions, myelination, degeneration, regeneration • Receptors: definition, structure classifications location & functions • Synapse: definition, structure classifications & functions • Autonomic nervous system: parts, autonomic nerve plexuses & ganglia • Coverings of brain and spinal cord : Pia, arachnoid and dura mater, their extension, folds, spaces, nerve supply & blood supply • Ventricular system and Cerebrospinal fluid (CSF) : Location of different ventricles of brain the formation, composition, circulation, absorption & functions of CSF • Blood-brain and Blood-CSF barriers: Composition & function	**TERM I** 01 hr **TERM III** 01hr 01 hrs **TERM I & II** 02 hrs **TERM III** 01 hr 02 hr

Learning Objectives	Contents	Teaching hours
Neuroanatomy Students will be able to: • describe the anatomical aspects of motor and sensory parts of nervous system with their functional and clinical significance	**CORE:** **Motor system** • Cerebrum (motor areas): Gyri, sulci and important functional areas with effects of lesion; mode of blood supply • Pyramidal & extrapyramidal system & effects of their lesion • Cerebellum: parts, functional lobes, nuclei, peduncles & functions, blood supply, clinical conditions • Basal nuclei: locations, parts, functions artery supply & clinical conditions • Motor and mixed Cranial Nerves: Classification, functional components, cranial nerve nuclei and course of cranial nerves **Sensory system** • Dermatome & axial line • Cerebrum(sensory areas): Gyri, sulci and important functional areas with effects of lesion; mode of blood supply • Ascending tracts of spinal cord with effects of lesions • Diencephalon: parts & functions • Sensory cranial nerves & Smell, visual & auditory pathway • Spinal Cord: Length, extension, enlargement, blood supply, cross-sections at different level • Brain stem: blood supply, cross sections at different levels • Reticular formation • Limbic system	**TERM III** 02 hrs 01 hr 01 hr 02 hr 01hr 01 hr 01 hr 01 hr 01 hr 01 hr 01hr

Learning Objectives	Contents	Teaching hours (Total 24 hrs)
Living (surface) Anatomy Students will be able to: • locate and count ribs & costal cartilages • draw and demonstrate important anatomical points and structures of Thorax on the surface of the body	**Thorax** **CORE:** • Counting of ribs and costal cartilages • Heart- apex and borders • Lung-borders and apex, • Trachea & Bronchi • Esophagus • Triangle of auscultation • Jugular notch • Sternal angle • Area of Superficial Cardiac dullness Common carotid and subclavian artery Internal thoracic artery	**For Tutorial** 06 hrs.
Students will be able to: • draw and demonstrate important anatomical points and structures of Superior extremity on the surface of the body	**Superior extremity** **CORE** • Nerves: Radial, Ulnar, Median nerve, Axillary nerve • Arteries: Brachial, Radial, Ulnar artery, Superficial and deep palmar arch • Veins: cephalic, basilic & median cubital vein • Flexor retinaculum • Anatomical snuff box • Medial humeral epicondyle	04 hrs.

Learning Objectives	Contents	Teaching hours
Living (surface) Anatomy Students will be able to: • locate, demonstrate the different anatomical planes and land marks on the surface of the body • draw, demonstrate the nine regions of the abdomen on the surface of the body • draw and indicate inguinal canal on the surface of the body • draw and demonstrate important anatomical points, borders and parts of important organs of abdomen on the surface of the body Students will be able to: • locate and demonstrate important points and structures of inferior extremity on the surface of the body	**<u>CORE:</u>** ***Abdomen*** • Trans-pyloric plane, Trans tubercular plane, Subcostal plane, mid clavicular line • Regions of abdomen • Superficial & deep inguinal ring, Inguinal canal • Abdominal aorta & inferior vena cava • Stomach, Duodenum, Pancreas, Liver, Gall bladder, Bile duct, spleen, Kidney from back & Mac Burney's point • Transverse colon, ureter from front and back, celiac trunk, splenic artery, Root of the mesentery **Inferior extremity** • Common peroneal nerve, Tibial nerve • Popliteal artery • Anterior & posterior tibial artery • Arteria dorsalis pedis • Great Saphenous vein • Small Saphenous vein • Adductor tubercle • Lateral and Medial Malleolus • Greater trochanter of femur • Anterior superior iliac spine **<u>Additional</u>** • Femoral nerve, sural nerve, Medial and lateral plantar artery, plantar arch.	**<u>For Tutorial</u>** 6 hrs. 4 hrs.

Learning Objectives	Contents	Teaching hours
Students will be able to: • draw and demonstrate important anatomical points and structures of Head and Neck on the surface of the body	**Head and neck** • Facial artery, Facial vein • Internal jugular vein, External jugular vein • Common Carotid artery & its bifurcation • Facial Nerve & their branches • vagus nerve in the neck • Parotid gland and its duct • Frontal and maxillary air sinuses • Thyroid gland • Tip of the coracoid process • Inferior angle of scapula • Tip of the 7th cervical spine **Additional:** • Pterion, lambda • Middle meningeal artery	**For Tutorial** 04 hrs.

Learning Objectives	Contents	Teaching hours (Total 09 hrs)
Anatomy of Radiology & Images Students will be able to: • describe radio-opaque and radio-lucent structures • identify and locate the normal structures in radiograph	**CORE** Radio opaque structures Radio-lucent structures *Plain X-ray of the* -chest PA view -abdomen AP view -pelvis AP view -arm including proximal & distal joints AP & lateral view -forearm including proximal & distal joints AP & lateral view -hand including proximal & distal joints -thigh including proximal & distal joints AP & lateral view -leg including proximal & distal joints AP & lateral view -foot including proximal & distal joints AP & lateral view -head & neck (cervical spine) AP & lateral view -Paranasal sinuses OM view **Additional:** • Common normal Ultrasonographs, Isotope scan, • Magnetic Resonance Images (MRI), CT Scan • Coronary Angiograph	**For Tutorial** 09 hrs

Learning Objectives	Contents	Teaching hours (Total 20 hrs)
Clinical Anatomy Students will be able to: • describe the anatomical basis of clinical disorder of structures of the thorax and the abdomen.	***Thorax*** • Pleurisy / Pleural effusion • Pneumothorax • Coronary artery disease • Pericarditis/ pericardial effusion • Flail chest • Paralysis of the diaphragm ***Abdomen*** • Portal vein obstruction • Hydrocele • Hernia • Peritonitis, ascites • Gastric ulcer • Duodenal ulcer • Gall stone/cholecystitis • appendicitis • Benign hyperplasia of prostate, Prostatic cancer • Cystocele • Stress incontinence • Rupture urethra • Salpingitis • Ectopic pregnancy • Prolapse of uterus / vagina • Haemorrhoids • Undescended testis • Psoas abscess • Ischiorectal abscess	**For Tutorial** 03 hrs 06 hrs

Learning Objectives	Contents	Teaching hours
Clinical Anatomy Students will be able to: • describe the anatomical basis of clinical disorder of the structures of head & neck, nervous system & extremities	***Head & Neck*** • Fracture of the skull bones • Scalp injury • Piriform fossa and foreign body • Otitis media • Sinusitis • Epistaxis • Tonsilitis • Swelling of thyroid gland • Mumps • Cavernous vein thrombosis • Cervical rib ***CNS & Eyeball*** • Injury to brain /eye ball / spinal cord/cranial nerves • Meningitis • Hydrocephalus • Cerebral ischaemia, intracranial haemorrhage (extradural,subarachnoid, cerebral) • Papilledema • Horner's syndrome ***Superior extremity*** • Dislocation of shoulder joint • Brachial plexus & injury to its nerves • Carpal tunnel syndrome • Colle's fracture • Breast abscess & breast cancer ***Inferior extremity*** • Varicose vein • Deep vein thrombosis • Nerve injury • Dislocation of hip joint • Rupture of menisci & cruciate ligament, Bursitis • Deformities of foot	**For Tutorial** 03hr . 03hr 03hr 02hr

Learning Objectives	Contents	Teaching hours
Clinical Anatomy Students will be able to: • describe the anatomical basis for selection of arteries, veins & muscles of clinical importance. • demonstrate the different auscultatory areas • describe the anatomical basis for clinical procedure of Thorax, Abdomen, Head & Neck , CNS & Eyeball.	• Arterial pulsation • Intravenous injections • Intramuscular injection • Apex beat, mitral, tricuspid, aortic & pulmonary areas • Sternal puncture • Pleural effusion • Pericardial effusion • Coronary angiogram • Bronchoscopy • Laryngoscopy • Paracentesis /peritoneal dialysis • Ryle's tube • Endoscopy • Liver abscess • Vasectomy • Tubal ligation • Nasogastric intubation • Palpation of Cervical lymph node • Lumbar puncture • Epidural/spinal anesthesia • Pudendal block • Fundoscopy	

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

Learning Objectives	Contents	Teaching hours
Students will be able to: • demonstrate the boundary & identify the contents of thoracic wall, thoracic cavity, mediastinum & intercostal space • identify & demonstrate the gross features of bones & joints of thorax • describe the formation, course, branches & distribution of spinal nerve / intercostal nerve • identify & demonstrate the surfaces, borders, parts, chambers- including structures within the chambers of the heart • explain blood supply & nerve supply of heart • identify & demonstrate the layers of pericardium • identify & demonstrate the surfaces, borders, fissures, lobes, hilus & bronchopulmonary units of the lung • identify & demonstrate the layers & parts of pleura. • explain the blood supply, lymphatic drainage & nerve supply of lung & pleura. • identify & demonstrate the trachea, bronchus & bronchial tree. • explain blood supply & nerve supply of trachea & bronchial tree. • explain the blood supply, nerve supply & lymphatic drainage of thoracic wall. • identify & demonstrate the surfaces, parts openings, attachments of the diaphragm. • explain the blood supply & nerve supply of the diaphragm. • explain the significance of the orifices of the diaphragm. • explain & demonstrate the extension, parts, relations & constrictions of oesophagus • explain the blood supply, lymphatic drainage & nerve supply of the oesophagus. • correlate clinical conditions associated with structures of thorax (Heart with its vessels, lung, trachea, bronchus, bronchial tree & the diaphragm)	• Thoracic wall formation, thoracic cavity, intercostal space and mediastinum. • Bones and joints of the thorax • Spinal nerve / intercostal nerve • Heart with pericardium. • Lung with pleura, trachea and bronchus. • Blood vessels, nerves and lymphatics of the thorax. • The diaphragm. • Oesophagus • Clinical Anatomy	45 hrs.

NB: Previously mentioned 53 hours in pages 10-16 for Tutorial also have shown in this part **(DISSECTION, DEMONSTRATION & *TUTORIAL*)**

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

Learning Objectives	Contents	Teaching hours
Students will be able to: • identify & demonstrate muscles, vessels, nerves of pectoral region including attachment of muscles • describe the parts of mammary gland & its blood supply, lymphatic drainage & nerve supply • demonstrate the boundary & identify the contents of axilla, quadrangular & triangular spaces, & cubital fossa • demonstrate the attachments of muscles, and identify vessels, nerves, lymphatics & lymph nodes of different parts of superior extremity • demonstrate the gross features of bones & joints of superior extremity and muscles acting on joints • correlate clinical conditions associated with structures (nerves, vessels, bones, joints) of superior extremity	• Pectoral region with mammary gland • Axilla • Superficial dissection of the upper limb, back and scapular region including quadrangular & triangular space Front of the arm, forearm and palm • Back of the arm, forearm and dorsum of the hand • Blood supply, lymphatic drainage, cutaneous innervation & dermatome of superior extremity • Bones & joints of the upper limb • Clinical Anatomy	43 hrs.

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

Learning Objectives	Contents	Teaching hours
Students will be able to: • demonstrate the different layers of anterior abdominal wall & hernial region • explain clinical types of hernia • demonstrate the different parts of GI Tract & its peritoneum • explain the mode of blood supply, lymphatic drainage & nerve supply of different organs • demonstrate the features of liver, pancreas, supra renal gland & different parts of biliary system • explain blood supply, lymphatic drainage & nerve supply of them. • demonstrate the features of kidney, suprarenal gland, ureter, urinary bladder, & urethra • explain their blood supply, lymphatic drainage & nerve supply • demonstrate the features of different parts of male & female reproductive system. • explain their blood supply, lymphatic drainage & nerve supply. • demonstrate the muscles and identify the vessels, nerves & lymphatics of posterior abdominal wall • demonstrate the parts and identify the contents of the pelvis • differentiate between male & female pelvis • demonstrate the gross features & joints of lumbar vertebra & bony pelvis and muscles acting on joints • correlate clinical conditions associated with different organs of the abdomen	• Anterior wall of the abdomen with hernial region. • Stomach, abdominal part of the oesophagus • Duodenum, pancreas and spleen. • The mesentery and mesenteric vessels, jejunum and ileum. • Large intestine. rectum & anal canal • Liver with the biliary apparatus including gall bladder; portal vein. • Kidney, suprarenal gland, ureter, urinary bladder & urethra. • Ovary, uterus, uterine tube, female external organs and perineum. • Vas deferens, seminal vesicle, prostate and male external genital organs. • Muscles, blood vessels, lymphatics and nerves of the posterior abdominal wall. • Muscles, blood vessels lymphatics, nerves of the pelvis. • Lumbar vertebra, bony pelvis & joints • Clinical Anatomy	103 hrs.

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

Learning Objectives	Contents	Teaching hours
Students will be able to: • demonstrate muscles attachments and identify vessels & nerves of different parts of inferior extremity • demonstrate the boundary and identify the contents of femoral triangle, adductor canal, popliteal fossa & sole of the foot • demonstrate the features of bones, joints, & muscles acting on joints • explain the venous drainage, lymphatic drainage, & dermatome of inferior extremity • correlate the clinical conditions associated with structures (nerves, vessels, bones, joints) of inferior extremity	• Front and medial side of the thigh • Gluteal region and back of the thigh • Front of the leg and dorsum of the foot • Lateral side, medial side and back of the leg including the popliteal fossa sole of the foot • Bones & joints of lower limb • Arches of the foot • Blood supply, lymphatic drainage, cutaneous innervation & dermatome of inferior extremity • Clinical Anatomy	42 hrs.

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

Learning Objectives	Contents	Teaching hours
Students will be able to: • identify and demonstrate the different parts of bones of head & neck, joints, & muscles acting on joints • state the gross features & attachments of skull bones including base of skull & cervical vertebrae. • demonstrate movements of joints of head & neck • demonstrate the layers of scalp identify the contents of temporal region • demonstrate the boundary of face and identify muscles and sensory supply of face • identify parotid gland & duct & explain the structures within the parotid gland • demonstrate the boundary and identify contents of different triangles of head & neck region • demonstrate the boundary and identify contents of mouth cavity • demonstrate the gross features & nerve supply of tongue • explain Auditory pathway (VIII – cranial nerve) • demonstrate the different parts of pharynx with their extension & muscles of pharynx, the walls of nose and paranasal air sinuses, the extension, cartilages & muscles of larynx • identify structures present in the internal surface of the larynx • demonstrate the region of vertebral column and attachments of muscles of the back • demonstrate the different parts of ear • correlate important clinical conditions associated with structures in Head & Neck (Thyroid gland, parathyroid gland, air sinuses, larynx, scalp, ear, face etc.)	• Bones & joints of head and neck • Scalp and temporal region • Face and orbit • Anterior triangle and its subdivisions, submandibular region including thyroid gland • Posterior triangle • Mouth and tongue • Pharynx • Nose and paranasal sinuses • Larynx • Vertebral column and deep dissection of the back of the neck • External, middle and internal ear. • Clinical Anatomy	87 hrs.

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

Learning Objectives	Contents	Teaching hours
Students will be able to: • demonstrate ❑ the boundary & contents of cranial cavity & orbit ❑ the different parts of brain & cranial nerves attached to brain ❑ the layers of meninges- Pia, arachnoid, and dura mater • explain the folds of dura & its contents • explain the blood supply & nerve supply of the meninges • demonstrate the boundary of different lobes of cerebrum, sulci, gyri & important functional areas • explain the blood supply of cerebrum including the formation of Circle Willis • demonstrate the parts & describe the functions & connections of ❑ diencephalon, pituitary gland, basal nuclei, ❑ internal capsule, extra pyramidal system & ❑ limbic system, brain stem • locate &describe • the nuclei, course, functional components & distribution of cranial nerves • the boundary & parts of ventricles circulation of CSF through ventricles • gross features of spinal cord and its meninges and spinal nerves attached to it • the coats of eyeball & the course of optic nerve • explain refractive media • explain the effects of lesion and loss of blood supply to different parts of nervous system.	• Introduction to the nervous system, cranial cavity and orbit. • General examination of the brain • Superficial attachments of cranial nerves • meninges of the brain • Cerebrum: lobes of cerebrum, sulci, gyri & important functional areas, blood supply, formation of Circle of Willis • Diencephalon: thalamus, hypothalamus, metathalamus, epithalmus and pituitary gland • Basal nuclei, internal capsule, extra pyramidal system and limbic system • Brain stem and reticular formation • Cranial nerves • Ventricles and cerebrospinal fluid Spinal cord & spinal nerves • eyeball • Clinical Anatomy.	40 hrs

Cell Biology & Histology Tutorial & Practical (Card I)

Learning Objectives	Contents	Teaching hours
Students will be able to: • demonstrate different parts of microscope & how to handle it • state the principles of tissue preparation • explain cell division • identify different types of tissue on slide under microscope	• Microscope: Parts & how to handle • Principles of different types of microscopy • Principles of tissue preparation and staining: • Fixation, embedding, sectioning & routine staining • Cell and cell division • Epithelium: Simple squamous, cuboidal, columnar, Pseudo stratified Stratified squamous, cuboidal, Stratified columnar Transitional • Connective tissue:: General, special, bone, cartilage • Muscular tissue: smooth, skeletal & cardiac muscle • Nervous tissue in general	17 hrs.

Cell Biology & Histology Tutorial & Practical (Card II)

Learning Objectives	Contents	Teaching hours
• Students will be able to identify different structures of the following systems on slides under microscope: Respiratory system. Cardiovascular system Digestive system and & associated Glands. Urinary system Male reproductive system and associated glands female reproductive system and associated glands	• Respiratory system Larynx, trachea, bronchial tree and Lung • Large artery, medium sized artery, large vein • Digestive system & associated glands Tongue, pharynx, oesophagus, stomach, small intestine & large intestine (including vermiform appendix) Liver and gall bladder, Pancreas • Urinary system Kidney, ureter, urinary bladder, urethrae • Male reproductive system and associated glands Testis, epididymis, vas deferens, seminal vesicle, prostate • Female reproductive system and associated glands Ovary, fallopian tube, uterus, vagina • Mammary gland , placenta	17hrs.

Cell Biology & Histology Tutorial & Practical (Card III)

Learning Objectives	Contents	Teaching hours
• Students will be able to identify following structures on slides under microscope: Lymphatic system Salivary glands Nervous system Endocrine system Special sense organs Skin	• Lymphatic system Lymph node, tonsil, spleen & thymus • Exocrine glands (salivary glands} • Nervous system spinal cord, cerebrum, cerebellum, peripheral nerve (including the optic nerve) • Endocrine gland (Pituitary, Thyroid, Parathyroid, Adrenal and Islet's of Langerhans • Special sense organs: Eyeball (cornea, retina), internal ear • Thick skin & thin skin	18 hrs.

Teaching - Learning & Assessment Methods

Teaching / Learning Method	***Teaching Aid***	***In Course Assessment***	***Summative Assessment***
Lecture	Computer & multimedia Slide projector, overhead projector (OHP), black board white and different colour chalk, white board and different colour white board markers.	• Item Examination: Oral, Practical • Card Completion Examination • Term Examinations: Written, Oral, Practical • Preparation of exercise book	• Written • Oral • Practical
Regional Anatomy: Demonstration & Tutorial	Cadavers, prosected parts, bones, viscera and other specimens of body parts, models, charts, black board white and different coloured chalk, white board and different coloured white board markers, Illustration sheets/posters, OHP, video, slide projector, computer with CD ROM, radiographs & other images. Projection system and Virtual anatomy dissection table		
Regional Anatomy: Dissection	Cadavers, prosected parts, specimens and bones, black board white and different coloured chalk, white board and different colour white board markers, Computer & multimedia. Projection system and Virtual anatomy dissection table		
Cell Biology & Histology Tutorial & Practical	Histological slide, Microscope & Projection microscope slide projector, black board white and different colour chalk, white board and different coloured white board markers, OHP, Illustration sheets (including photomicrographs & drawings)/posters, video projector, computer with CD ROM drive.		

Assessment in Anatomy

Component	Marks		Total Marks
Formative assessment	**10+10**		**20**
WRITTEN EXAMINATION **paper-I-** MCQ (SBA+MTF) (SAQ+ SEQ) **paper-II-** MCQ (SBA+MTF) (SAQ+ SEQ)	 **20** **70** **20** **70**		**180**
ORAL EXAMINATION (Structured) **Board I** **Board II**	 **75** **75**		**150**
PRACTICAL EXAMINATION	**Board I**	**Board II**	
Objective structured practical Exam (OSPE) **Dissection** **Anatomy of Radiology and imaging** **Lucky slides** **Living Anatomy** **Practical Khata**	**30** **10** **10** **10** **10** **05**	**30** **15** **10** **10** **10** **---**	**75 +75**
		Grand Total	**500**

- ***Topics: Board I: CNS & Eyeball, Head & Neck, Thorax (Gross anatomy, Clinical anatomy, Histology, Embryology).***
  Cell biology & Genetics. General Histology: Epithelial Tissue, Nervous Tissue. General Anatomy: Angiology, Neurology.
  Board II: Abdomen, Inferior & Superior Extremity (Gross anatomy, Clinical anatomy, Histology, Embryology).
  General Embryology. General Histology: Connective Tissue, Muscle Tissue General Anatomy: Osteology, Arthrology, Myology.
- ***Each student will appear in Board I & Board II in separate date/day for oral and practical examination***
- **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	10	02	13	-	01	02	**46**
Second Term	-	-	02	14	05	17	02	-	**40**
Third Term	-	-	02	02	-	07	18	-	**29**
Grand Total Hours (Class +Exam)	**12**	**06**	**14**	**18**	**18**	**24**	**21**	**02**	**115**

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
Grand Total Hours	**46**	**6**	**52**

Term	Cards	Dissection & Demonstration	Tutorial Review			Part Completion Examination Hours	Total Hours
			Living (surface) Anatomy	Anatomy of radiology & Images	Clinical Anatomy		
First Term	**Thorax**	34	6	1	3	01	**45**
	Superior Extremity	33	4	2	3	01	**43**
Second Term	**Abdomen**	89	6	1	6	01	**103**
	Inferior Extremity	33	4	2	2	01	**42**
Third Term	**Head, Neck**	77	4	2	3	01	**87**
	Central Nervous system and Eye ball	35	00	1	3	01	**40**
Grand Total Hours		**301**	**24**	**9**	**20**	**06**	**360**

ACADEMIC CALENDAR for ANATOMY

Class/Exam	*Hours(including Class exams hrs)*	*First Term (14 working weeks)*	Evaluation & leave 04 weeks	*Second Term (15 working weeks)*	Evaluation & leave 04 weeks	*Third Term (14 working weeks)*	2.Evaluation & preparatory leave for first prof–08 weeks 1.Evaluation & preparatory leave for third term;03 weeks
Lecture and Review	**115**	• General Anatomy-12 hrs • Cell Biology -06 hrs • Human Genetics - 02 hrs • General Histology-10 hr • Systemic Histology – 02 hrs • General Embryology - 13 hrs • Neuroanatomy – 01 hrs		• General Histology-02 hr • Systemic Histology - 14 hrs • General Embryology - 05 hrs • Systemic Embryology- 17 hrs • Neuroanatomy – 02 hrs		a) General histology - 02 hr b) Systemic Histology -02 hrs c) Systemic Embryology - 07 hrs d) Neuroanatomy - 18hrs	
Tutorial/ Review	**53**	Thorax Card – 10 hrs Sup. Ext. Card – 09 hrs		Abdomen Card – 13 hrs Inf. Ext. Card – 08 hrs		Head & Neck Card –09 hrs C.N.S & Eyeball – 04 hrs	
Dissection	**301**	Thorax Card - 34hrs Sup Ext Card- 3hrs		Abdomen Card – 89hrs Inf. Ext. Card – 33hrs		Head & Neck Card – 77 hrs C.N.S & Eyeball Card - 35 hrs	
Card Completion Exam	**06**	Thorax Card- 01hrs Sup Ext. Card- 01hrs		Abdomen Card– 01hrs Inf. Ext. Card – 01hrs		Head & Neck Card –01 hrs C.N.S & Eyeball Card - 01 hrs	
Cell Biology & Histology-Tutorial/ Practical	**52**	Card I – 17hrs		Card II - 17hrs		Card III – 18 hrs	
Grand Total	**527**						

N.B.- Card completion examinations will be arranged on discussion with other departments

(Physiology, Biochemistry)

Prerequisite for 1st professional examination

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

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THORAX CARD

(ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)

Year	
Session	
Roll No.	
Batch	

Card no.	
Cadaver no.	
Total marks	
Pass marks	

Name of the student				
Period of placement	**From :**		**To :**	

Part for dissection (item)	**Date of beginning**	**Date of examination**	**Marks obtained**	**Remarks and Signature of the Lecturer**
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 bronchial tree				
5. The Diaphragm & oesophagus				
6. Blood vessels, nerves and lymphatics of the thorax				
7. Living Anatomy				
8. Anatomy of Radiology & Images				
***Each item should cover related clinical & functional anatomy**				

No. of attendance in the practical classes of the card		**Out of**	
Mark obtained			
Remarks			
Signature of the Lecturer			
Signature of Head of the Department			

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SUPERIOR EXTREMITY CARD
(ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)

Year		**Card no.**	
Session		**Cadaver no.**	
Roll No.		**Total marks**	
Batch		**Pass marks**	

Name of the student				
Period of placement	**From :**		**To :**	

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. Shoulder joint, acromioclavicular joint, elbow joint, wrist joint, joints of hand				
9. Living Anatomy				
10. Anatomy of Radiology & Images				
***Each item should cover related clinical & functional anatomy**				

No. of attendance in the practical classes of the card		**Out of**	
Mark obtained			
Remarks			
Signature of the Lecturer			
Signature of Head of the Department			

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ABDOMEN CARD

(ITME EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)

Year		**Card no.**	
Session		**Cadaver no.**	
Roll No.		**Total marks**	
Batch		**Pass marks**	

Name of the student				
Period of placement	**From:**		**To :**	

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 and 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				
13.Perineum, pelvic diaphragm, urogenital diaphragm, perineal pouches, ischiorectal fossa				
14.Vas deferens, seminal vesicles, prostate, testes and male external genital organs				
15. Living Anatomy				
16.Anatomy of Radiology & Images				
***Each item should cover related clinical & functional anatomy**				

No. of attendance in the practical classes of the card		**Out of**	
Mark obtained			
Remarks			
Signature of the Lecturer			
Signature of Head of the Department			

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INFERIOR EXTREMITY CARD
(ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)

Year	
Session	
Roll No.	
Batch	

Card no.	
Cadaver no.	
Total marks	
Pass marks	

Name of the student				
Period of placement	**From :**		**To :**	

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 inferior extremity				
2. Front and medial side of the thigh				
3. Gluteal region and back of the thigh				
4. Front of the leg and dorsum of the foot				
5. Lateral side, medial side and back of the leg including the popliteal fossa., sole of the foot				
6. Blood vessels, nerves and lymphatics of the inferior extremity				
7. Hip joint, knee joint, tibiofibular joints , ankle joint				
8. Joints and arches of the foot				
9. Living Anatomy				
10. Anatomy of Radiology & Images				
***Each item should cover related clinical & functional anatomy**				

No. of attendance in the practical classes of the card		**Out of**	
Mark obtained			
Remarks			
Signature of the Lecturer			
Signature of Head of the Department			

DEPARTMENT OF ANATOMY

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HEAD AND NECK CARD

(ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)

Year	
Session	
Roll No.	
Batch	

Card no.	
Cadaver no.	
Total marks	
Pass marks	

Name of the student				
Period of placement	**From :**		**To :**	

Part for dissection (item)	**Date of beginning**	**Date of examination**	**Mark obtained**	**Remarks and Signature of the Lecturer**
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. Organ of hearing and equilibrium (Ear)				
15. Living Anatomy				
16. Anatomy of Radiology & Images				
***Each item should cover related clinical & functional anatomy**				

No. of attendance in the practical classes of the card		**Out of**	
Mark obtained			
Remarks			
Signature of the Lecturer			
Signature of Head of the Department			

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CENTRAL NERVOUS SYSTEM AND EYEBALL CARD

(ITEM EXAM FOLLOWING DISSECTION, DEMONSTRATION & TUTORIAL)

Year	
Session	
Roll No.	
Batch	

Card no.	
Cadaver no.	
Total marks	
Pass marks	

Name of the student				
Period of placement	**From :**		**To :**	

Part for dissection (item)	**Date of beginning**	**Date of examination**	**Mark obtained**	**Remarks and Signature of the Lecturer**
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. White matter of cerebrum, Basal ganglia,, Pyramidal and extra -pyramidal system , limbic system				
7. Brain stem, reticular formation & Cerebellum				
8. Ventricles and cerebrospinal fluid				
9. Spinal cord & Spinal nerve				
10. Eyeball				
11. Living Anatomy				
12. Anatomy of Radiology & Images				
***Each item should cover related clinical & functional anatomy**				

No. of attendance in the practical classes of the card		**Out of**	
Mark obtained			
Remarks			
Signature of the Lecturer			
Signature of Head of the Department			

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HISTOLOGY CARD NO. I

Year	
Session	
Roll No.	
Batch	

Total marks	
Pass marks	

Name of the student				
Period of placement	**From :**		**To :**	

Item	Date of beginning	Date of examination	Marks obtained	Remarks and Signature
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 – proper				
7. Muscular tissue (skeletal, cardiac, smooth)				
8. Nervous tissue in general				

Total No. of attendance		**Out of**	
Marks obtained			
Remarks			
Signature of the Lecturer			
Signature of the Prof. of Anatomy			

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HISTOLOGY CARD NO. II

Year	
Session	
Roll No.	
Batch	

Total marks	
Pass marks	

Name of the student				
Period of placement	**From :**		**To :**	

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

Total No. of attendance		**Out of**	
Marks obtained			
Remarks			
Signature of the Lecturer			
Signature of the Prof. of Anatomy			

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HISTOLOGY CARD NO. III

Year	
Session	
Roll No.	
Batch	

Total marks	
Pass marks	

Name of the student				
Period of placement	**From :**		**To :**	

Item	Date of beginning	Date of examination	Marks obtained	Remarks and Signature
1. Lymphoid organ				
2. Salivary glands				
3. Endocrine Glands				
4. Nervous system				
5. Skin –thick skin & thin skin, Special sense organ (Cornea, Retina, Internal ear)				

Total No. of attendance		**Out of**	
Marks obtained			
Remarks			
Signature of the Lecturer			
Signature of the Prof. of Anatomy			