

CURRICULUM FOR PHASE 1

ANNUAL TIMETABLE

DEPARTMENTS OF ANATOMY, PHYSIOLOGY, BIOCHEMISTRY

Guntur Medical College

- 1.Foundation Course
2. General Module
3. General Embryology, Genetics, General Histology, Hematological System & Immunological System
4. Locomotor System & Autonomic Nervous System
5. Endocrine System, Postnatal Growth & Development
6. Respiratory system
7. Cardiovascular System
8. Gastrointestinal System, Hepatobiliary& Pancreatic System & Nutrition
9. Renal System
10. Reproductive System and Mammary Gland
11. Nervous System, Head & Neck, Special Senses, Molecular Biology, Cancer Biology & Integrative Physiology

TOTAL TEACHING HOURS-

Subject	Theory Sessions	Practical-Tutorial-SGT-IT-Sessions	SDL	Total Sessions
Anatomy	220	415	40	675
Physiology	160	310	25	495
Bio-Chemistry	80	150	20	250
ECE	90	-	-	90
AET-COM	26	-	8	34

I MBBS SYSTEM-BASED AND TEMPORARILY SYNCHRONIZED CONTENT

1.1 ANATOMY GENERAL ANATOMY

1.1.1 (Theory)

- Introduction to Anatomy – Anatomical terms
- Introduction to Skeletal system – Bones
- Introduction to Skeletal system – Joints
- Introduction to Muscular system
- Introduction to Vascular system and Lymphatic system
- Introduction to Nervous System
- Introduction to Integumentary System

1.1.2 (Theory SDL)

- Types of ossification

1.1.3 (Practical)

- Anatomical position, terms, planes & sections
- Skeletal system
- Muscular system
- Nervous system
- Vascular system and lymphatic system
- Integumentary system

1.2 PHYSIOLOGY GENERAL PHYSIOLOGY

1.2.1 (Theory)

- Importance of Physiology in medicine
- Functional organization of human body, Principles of Homeostasis and physiological control mechanism
- Intercellular connections and Communications
- Transport across cell membrane
- Body fluids: Principles and methods of measurement of body fluid compartments

1.2.2 (Theory SDL)

- Functional organization of Cell and its organelles

1.2.3 (Practical)

- Introduction
- Microscopy and collection of blood samples

1.3 BIOCHEMISTRY GENERAL BIOCHEMISTRY

1.3.1 (Theory)

- Enzyme kinetics, Inhibition and regulation of enzyme activity, Isoenzymes:
- Chemistry of carbohydrates / lipids / proteins:
- Biological oxidation and ATP synthesis:
- Enzymes in clinical diagnosis:

1.3.2 (Theory SDL)

- Enzymes in clinical diagnosis:

1.3.3 (Practical)

- Color reactions of carbohydrates
- Color reactions of proteins

2.1 ANATOMY GENERAL EMBRYOLOGY, GENETICS & GENERAL HISTOLOGY

2.1.1 (Theory)

GENERAL EMBRYOLOGY

- Cell structure & Division
- Gametogenesis
- week of development
- II week of development
- III week of development
- Embryonic period
- Placenta & umbilical cord
- Twinning & teratogens

GENETICS

- Structural aberrations of chromosomes
- Numerical aberrations of chromosomes
- Modes of inheritance
- Prenatal diagnosis and Genetic counseling

2.1.2 (Theory SDL)

- Structure & Classification of chromosomes
- Karyotyping

2.1.3 (Practical)

General Histology Practical:

- Epithelial tissue
- Connective Tissue-General
- Cartilage
- Bone
- Muscular tissue
- Peripheral Nerve & Autonomic Ganglia
- Blood vessels
- Lymphoid organs-I
- Lymphoid organs-II
- Skin
- Demonstration of Embryology models
- Demonstration of genetics models

2.2 PHYSIOLOGY HEMATOLOGY & IMMUNOLOGY

2.2.1 (Theory)

- Introduction to blood and Functions of plasma proteins
- Abnormal Hemoglobin's, Jaundice & Physiological basis of Jaundice
- Classification and physiological basis of Anemia;

Hematinic Factors

- Physiological basis of investigations for Anemia and Jaundice
- Blood Grouping, physiological basis of blood transfusion and its reactions
- White blood cells – Structure, Functions and fate of WBCs
- Principles of Haemopoiesis and Bone marrow microenvironment
- Erythropoiesis – Principles and Regulation
- Leucopoiesis - Principles and regulation
- Immunity and Development of immunity Adaptive immunity and its mechanisms
- Immune Response and Complement System
- Immune tolerance, Immunotherapy, Immunodeficiency and Immunomodulation
- Thrombopoiesis, structure, functions and fate of Platelets
- Hemostasis and Clotting mechanisms
- Haemostatic Balance – Anti-haemostatic and prohaemostatic mechanisms

- Haemorrhagic Disorders
- Tests for Platelet and Clotting functions

2.2.2 (Theory SDL)

- Red Blood Cell – Structure, Functions and fate of RBCs
- Red blood cell turnover
- Lymphoid organs and Lymph
- Innate immunity and its mechanisms

2.2.3 (Practical)

- Hb estimation
- Hemocytometry & PCV
- Revision of Hemoglobin
- RBC Count
- ESR and Osmotic fragility
- Peripheral Smear
- TLC
- DLC
- Blood Group, BT, CT
- Arneeth Count
- Revision Blood Group, BT, CT
- AEC
- Platelet & Reticulocyte demonstration

2.3 BIOCHEMISTRY HEMATOLOGY & IMMUNOLOGY

2.3.1 (Theory)

- Immunoglobulin structure and types, antigen-antibody complex Hemoglobin; Structure and function
- Heme: Synthesis, Catabolism and disorders
- Anemia: Vitamins: B12, folic Acid, B6, Iron
- Hemoglobinopathies

2.3.2 (Theory SDL)

- Biochemical Investigations in Anemia

2.3.3 (Practical)

- Demonstration of immunological techniques (ELISA, Chemiluminiscence) Colorimetry.

3. LOCOMOTOR SYSTEM & AUTONOMIC NERVOUS SYSTEM

3.1 ANATOMY LOCOMOTOR SYSTEM

3.1.1 (Theory)

LOCOMOTOR SYSTEM – Upper Limb

- Introduction & development of locomotor system, pectoral region
- Axilla
- Shoulder joint complex
- Elbow & wrist joints
- Hand – muscles, vessels & nerves
- Hand – spaces
- Nerve injuries of upper limb
- Venous & lymphatic drainage of upper limb

LOCOMOTOR SYSTEM – Lower Limb

- Introduction, femoral triangle, adductor canal
- Hip joint
- Popliteal fossa
- Knee joint
- Ankle joint, joints of foot
- Arches of foot
- Venous drainage of lower limb

3.1.2 (Theory SDL)

- Cubital fossa
- Intermuscular spaces around shoulder
- Radioulnar joints
- Hand grips
- Femoral canal
- Saphenous opening
- Tibiofemoral joints
- Gait

3.1.3 (Practical)

LOCOMOTOR SYSTEM – Upper Limb Gross

- Pectoral region
- Axilla

- Scapular region
- Arm
- Forearm
- Hand
- Surface anatomy & radiology

Osteology

- Clavicle, scapula
- Humerus
- Radius, ulna
- Articulated hand

LOCOMOTOR SYSTEM – Lower Limb Gross

- Front of thigh
- Adductor compartment
- Gluteal region
- Posterior compartment of thigh
- Popliteal fossa
- Anterior & lateral compartment of leg and dorsum of foot
- Posterior compartment of leg & retinacula around ank● Sole
- Surface anatomy & radiology

Osteology

- Hip bone
- Femur
- Tibia & fibula

3.2 PHYSIOLOGY LOCOMOTOR SYSTEM & AUTONOMIC NERVOUS SYSTEM

3.2.1 (Theory)

- Resting Membrane Potential
- Nerve
- Neuromuscular junction
- Skeletal Muscle
- Smooth muscle
- Autonomic nervous system: functional organization
- Sympathetic and para sympathetic systems

- Autonomic function tests

3.2.2 (Theory SDL)

- Dysfunctions of autonomic nervous system

3.2.3 (Practical)

- Mosso's Ergography
- Nerve conduction test and Surface EMG
- Lying to standing
- Deep breathing difference
- Isometric handgrip test
- Cold pressor test

3.3 BIOCHEMISTRY LOCOMOTOR SYSTEM & AUTONOMIC NERVOUS SYSTEM

3.3.1 (Theory)

- Minerals: Calcium, Phosphorus, Magnesium
- Vitamins: Vitamin D and pantothenic acid
- Rickets, Fanconi syndrome

3.3.2 (Theory SDL)

- Disorders of muscles: Muscular dystrophy, malignant hyperthermia

3.3.3 (Practical)

- Estimation of calcium and Phosphorus

4 ENDOCRINE SYSTEM, POSTNATAL GROWTH & DEVELOPMENT

4.1 ANATOMY ENDOCRINE SYSTEM

4.1.1 (Theory)

- Pituitary gland- Gross, microscopic and developmental anatomy
- Thyroid and parathyroid - Gross anatomy
- Thyroid and parathyroid - Microscopic and developmental anatomy
- Adrenal gland - Gross, microscopic and developmental anatomy Postnatal growth and development- I, II, III, IV

4.1.2 (Theory &SDL)

- Islets of Langerhans
- Diffuse Endocrine system

4.1.3 (Practical)

- Demonstration of gross specimen
- Demonstration of embryology models
- Histology - pituitary and adrenal gland
- Histology - thyroid and parathyroid

4.2 PHYSIOLOGY ENDOCRINE SYSTEM

4.2.1 (Theory)

- Mechanisms of hormonal action
- Pituitary Gland and Hypothalamus, Hypothalamo-Pituitary Endocrine axis
- Anterior Pituitary hormones
- Hormones from Posterior and Intermediate lobe of Pituitary, Hypothalamic Hormones
- Endocrine disorders of Hypothalamus and pituitary gland
- Thyroid Hormone – Biosynthesis, Secretion and Regulation of thyroid secretion
- Physiological effects of Thyroid Hormone
- Endocrine disorders of thyroid gland
- Adrenocortical hormones – Biosynthesis, Functions and Regulation of secretion
- Endocrine disorders of Adrenal gland
- Endocrine Pancreas – insulin & glucagon- Biosynthesis, Secretion, Functions and Regulation of secretion
- Disorders of endocrine pancreas
- Hormones of Calcium Homeostasis - Biosynthesis, Functions and Regulation of secretion
- Disorders of Calcium Homeostasis
- Pineal gland
- Hormonal changes in Stress response

4.2.2 (Theory SDL)

- Introduction and General Principles of regulation of endocrine secretions
- Thyroid function tests
- Adrenomedullary hormones – Biosynthesis, Functions and Regulation of secretion
- Local hormones

4.2.3 (Practical)

- CVS and RS practical's will be taken during these 3 weeks" time

4.3 BIOCHEMISTRY ENDOCRINE SYSTEM

4.3.1 (Theory)

- Regulation of blood glucose, Metabolism in starvation,
- Thyroid function tests, Adrenocortical function tests,
- Diabetes mellitus, OGTT

4.3.2 (Theory SDL)

- Interpretation of thyroid and adrenal function test

4.3.3 (Practical)

- Demonstration of Blood Glucose Estimation, ABG, PT

5 RESPIRATORY SYSTEM

5.1 ANATOMY RESPIRATORY SYSTEM

5.1.1(Theory)

- Introduction of respiratory system, paranasal air sinuses
- Nasal cavity & Nasopharynx
- Larynx I
- Larynx II
- Thoracic cage, inlet, outlet, intercostal space
- Intercostal muscles, nerves and vessels
- Diaphragm
- Pleura
- Development of respiratory system

5.1.2 (Theory & SDL)

- Trachea, bronchi & Bronchopulmonary segments
- Cross sectional anatomy of thoracic cavity
- Diaphragmatic hernia

5.1.3 (Practical)

- Thoracic vertebra & sternum
- Thoracic ribs, joints
- Nasal cavities, nasopharynx
- Lungs – right and left
- Histology of trachea, bronchi, lung, epiglottis

- Embryology models
- Radiological anatomy of respiratory system- nasal cavity, paranasal sinuses
- chest x-ray
- Surface anatomy of respiratory system

5.2 PHYSIOLOGY RESPIRATORY SYSTEM

5.2.1 (Theory)

- Functional organization & non-respiratory functions of RS
- Mechanics of breathing & compliance
- Pulmonary surfactant & Transport of gases
- Regulation of respiration
- Application of PFT – Obstructive vs Restrictive
- Respiration in altered barometric pressure

5.2.2 (Theory & SDL)

- Lung Volumes & capacities
- Classification & Methods of estimating PFT
- Oxygen therapy
- Abnormal respiration
- Assisted Ventilation & CPR

5.2.3 (Practical)

- Stethography
- Effect of posture on vital capacity
- Clinical Examination of RS
- PFT (demo)

5.2 BIOCHEMISTRY RESPIRATORY SYSTEM

5.3.1 (Theory)

- General aspects of acid base balance, Respiratory regulation of blood pH and related disorders
- Interpretation of acid base disorders

5.3.2 (Theory & SDL)

- Interpretation of acid base disorders

5.3.3 (Practical)

- ATCOM (Communication skills part I)

6 CARDIOVASCULAR SYSTEM

6.1 ANATOMY CARDIOVASCULAR SYSTEM

6.1.1 (Theory)

- Introduction to CVS, Mediastinum and contents
- Pericardium and External features of the Heart
- Blood supply to heart
- Chambers of heart-I & Chambers of heart-II
- Superior mediastinum & Posterior mediastinum
- Embryology-development of heart, aortic arches, major veins

6.1.2 (Theory SDL)

- Nerve supply to heart, heart valve complex
- Atrial and ventricular septal defects, TOF, PDA, Coarctation of aorta
- Fetal circulation

6.1.3 (Practical)

- Location of heart, pericardium and pericardial sinuses
- External features of heart, blood vessels of the heart
- Internal features of chambers of the heart
- Superior mediastinum & Posterior mediastinum
- Surface and radiological anatomy
- Embryology models

6.2 PHYSIOLOGY CARDIOVASCULAR SYSTEM

6.2.1 (Theory)

- Properties of cardiac muscle
- Conductive system of heart
- Electrophysiology of heart and ECG
- Cardiac cycle
- Cardiac output
- Regulation of heart rate

- Cardiac hemodynamics
- Blood pressure (mechanism & regulation)
- Hypertension
- Hypotension & shock
- Heart failure & its management
- Cerebral circulation
- Coronary circulation
- Cutaneous & Splanchnic circulation
- CVS, RS changes during exercise

6.2.2 (Theory SDL)

- Functional anatomy of heart
- JVP and heart sounds
- Physiology of blood vessels
- Fetal circulation

6.2.3 (Practical)

- Examination of peripheral pulses & recording of BP
- ECG
- Effect of posture on BP
- Effect of exercise on BP
- Systolic time interval (demo)
- Examination of cardiovascular system
- Cardiac AFT

6.3 BIOCHEMISTRY CARDIOVASCULAR SYSTEM

6.3.1 (Theory)

- Collagen – structure, disorders
- Lipid metabolism, prostaglandins
- Sulphur containing aa, Homocysteine metabolism and disorders
- Free radicals and antioxidants
- Interpretation of lipid profile,

6.3.2 (Theory SDL)

- Hyper lipoproteinemia, metabolic syndrome

6.3.3 (Practical)

- Demonstration of estimation of cholesterol

7. GASTROINTESTINAL SYSTEM, HEPATOBILIARY & PANCREATIC SYSTEM & NUTRITION

7.1 ANATOMY GASTROINTESTINAL SYSTEM, HEPATOBILIARY & PANCREATIC SYSTEM

7.1.1 (Theory)

- Introduction to GIT & Anterolateral abdominal wall
- Inguinal Canal
- Peritoneum
- Pharynx and esophagus
- Stomach
- Duodenum
- Pancreas
- Liver
- Extrahepatic Biliary Apparatus
- Portal vein & Portosystemic Anastomosis
- Caecum & Vermiform Appendix
- Rectum
- Anal Canal, Ischio-anal fossa
- Development of GIT

7.1.2 (Theory SDL)

- Oral cavity
- Inguinal Hernia
- Surgical Incisions
- Pyloric stenosis

7.1.3 (Practical)

Gross Anatomy Demonstration

- Anterolateral Abdominal Wall & Inguinal Canal
- Peritoneal folds and recesses
- Stomach, Duodenum & Coeliac Trunk
- Jejunum, Ileum & Superior Mesenteric Artery
- Caecum & Appendix
- Colon, Rectum, Anal Canal & Inf. Mesenteric Artery

- Liver
- Extrahepatic Biliary Apparatus & Portal vein
- Pancreas
- Spleen

Osteology:

- Lumbar Vertebra & Sacrum
- Osteology of Pelvis
- Surface anatomy of all organs of GIT
- Radiology - Plain and contrast Radiographs
- Demonstration of GIT Embryology models

Histology:

- Salivary Glands- Serous, Mucous, Mixed
- Esophagus, Stomach
- Duodenum, Jejunum, Ileum
- Colon, Appendix
- Liver, Gallbladder, Pancreas

7.2 PHYSIOLOGY GASTROINTESTINAL SYSTEM, HEPATOBILIARY & PANCREATIC SYSTEM & NUTRITION

7.2.1 (Theory)

- Functional organization of gastrointestinal tract and principles of GI tract
- Enteric nervous System and applied aspects
- Overview of Gastrointestinal Motility and Electro-mechanical Events in GI Tract
- Role of Oral cavity and Salivary glands in GI Function
- Role of Esophagus in GI Function; Deglutition and Esophageal motility
- Functional organization of Stomach and its Electro-mechanical activities
- Gastric Acid Secretion and its Regulation
- Gastric function tests and Peptic Ulcer disease
- Exocrine Pancreas – Secretion and Regulation
- Duodenum – Secretory, Digestive and Absorptive Events
- Liver – Functional organization and role in Digestion
- Gall bladder - Functional organization and role in Digestion
- Small intestine – Secretion, absorption, motility and electromechanical properties

- Large Intestine – Absorption, secretion, motility and electromechanical properties
- Review of Gastrointestinal Motility and applied aspects
- Upper and Lower GI disorder & Problem based learning

7.2.2 (Theory SDL)

- Pancreatic function tests and Liver function tests
- Gastrointestinal Hormones
- Digestion and absorption of carbohydrate / protein / fat in the GI tract
- Gastrointestinal flora, GI lymphoid organs and Immune functions

7.2.3 (Practical)

- Abdominal examination

7.3 BIOCHEMISTRY GASTROINTESTINAL SYSTEM, HEPATOBILIARY & PANCREATIC SYSTEM & NUTRITION

7.3.1 (Theory)

Gastrointestinal system and Nutrition

- Digestion and absorption of carbohydrates, lipids, amino acids
- Metabolism of carbohydrates (Glycogenesis, Glycogenolysis, Gluconeogenesis) and amino acids (Aromatic aa, glycine, branched chain, polyamine)
- Micronutrients; Vitamins, Minerals
- BMR, SDA, Balanced diet, dietary fibers Hepatobiliary and Pancreatic function tests
- Bilirubin metabolism, Bile acid synthesis
- Xenobiotics
- Types of jaundice and their biochemical alterations

7.3.2 (Theory SDL)

- Diet therapy in disease conditions, PEM
- Interpretation of LFT, Pancreatic function tests

7.3.3 (Practical)

Demonstration of chromatography

- Estimation of Bilirubin

8 RENAL SYSTEM

8.1 ANATOMY RENAL SYSTEM

8.1.1 (Theory)

- Kidney & ureter
- Urinary Bladder
- Urethra Male & Female
- Development of Kidney, Ureter and Urinary Bladder

8.1.2 (Theory SDL)

- Renal Angle
- Morris Parallelogram

8.1.3 (Practical)

- Gross
 - Posterior Abdominal Wall
 - Kidney & its Relations
 - Ureter
 - Urinary Bladder
- Histology
 - Kidney
 - Ureter and Urinary Bladder
- Embryology Models

8.2 PHYSIOLOGY RENAL SYSTEM

8.2.1 (Theory)

- Renal circulation-special features.
- Measurement and regulation of renal circulation and clearance
- Juxtaglomerular apparatus
- Glomerular filtration & GFR-Factors and measurement
- Renin-Angiotensin-Aldosterone system
- Tubular function (reabsorption, secretion and handling of solutes, electrolytes and water)
- Mechanism of urine concentration and dilution
- Role of kidney in Water and Osmolarity balance
- Role of kidney in acid base balance
- Micturition, Cysto-metro gram, Disorders of Bladder function and Micturition
- Physiological basis of Renal failure, Dialysis

8.2.2 (Theory SDL)

- Functional organization of the renal system, Non-excretory functions of Kidney
- Principle of Diuresis and Diuretics

8.2.3 (Practical)

- No Practical

8.3 BIOCHEMISTRY RENAL SYSTEM

8.3.1 (Theory)

- Excretory function: Formation of ammonia, Detoxification of ammonia, Urea cycle
- Regulatory function: Water and electrolyte balance (Na, K, Cl), Renal regulation of pH
- Renal function test: Tests for glomerular and tubular functions

8.3.2 (Theory SDL)

- Interpretation of RFT, Disorders of urea cycle (Hyperammonemia)
- Lab diagnosis of renal failure, nephritic/ nephrotic syndrome, RTA
- Interpretation of metabolic acidosis and metabolic alkalosis

8.2.3 (Practical)

- Urine analysis – normal and abnormal
- Demonstration of urea, creatinine, pH meter and pH indicator, potentiometric analysis of electrolytes

9 REPRODUCTIVE SYSTEM & MAMMARY GLANDS

9.1 ANATOMY REPRODUCTIVE SYSTEM & MAMMARY GLAND

9.1.1 (Theory)

- External genitalia – male and female
- Testis and spermatic cord
- Perineum
- Pelvic diaphragm with pelvic peritoneal pouches
- Prostate and accessory male reproductive organs
- Uterus, Adnexa and ovaries&
- Lateral pelvic wall
- Mammary gland
- Development of reproductive system

9.1.2 (Theory SDL)

- Prostatic urethra

- Ambiguous genitalia
- Remnants of mesonephric and paramesonephric ducts

9.1.3 (Practical)

Gross Anatomy:

- Male reproductive organs (Male external genitalia, & prostate, Testis, seminal vesicles)
- Female reproductive organs (Uterus with adnexa & vagina, Supports of uterus and Ovaries)
- Lateral pelvic wall
- Sections of pelvic cavity – Male and female
- Models for development of reproductive system

Histology:

- Testis, epididymis, Vas deferens
- Seminal vesicle & prostate, Penis, Uterus, Uterine tube
- Ovary, mammary gland, and placenta

Radiology: Hystero-salpingography, Cystoscopy

9.2 PHYSIOLOGY REPRODUCTIVE SYSTEM

9.2.1 (Theory)

- Sex differentiation and development
- Male reproduction system
- Female reproduction system
- Physiology of pregnancy and parturition
- Physiology of contraception

9.2.2 (Theory SDL)

- Physiology of breast development and lactation

9.2.3 (Practical)

- No Practical

9.3 BIOCHEMISTRY

REPRODUCTIVE SYSTEM

9.3.1(Theory)

- Biosynthesis of Gonadal Hormones
- Gonadal function test

- Prenatal screening test

9.3.2 (Theory SDL)

- Disorders of Gonadal hormonal function

9.3.3(Practical)

- No Practical

10. NERVOUS SYSTEM, HEAD & NECK, SPECIAL SENSES, MOLECULAR BIOLOGY, CANCER BIOLOGY & INTEGRATIVE PHYSIOLOGY

10.1 ANATOMY CENTRAL NERVOUS SYSTEM, HEAD & NECK & SPECIAL SENSES

10.1.1 (Theory)

- Scalp
- Posterior Triangle of neck
- Anterior Triangle of neck
- Parotid region
- Submandibular region
- Infratemporal fossa
- Temporomandibular joint
- Pharynx
- Meninges & Dural venous sinuses
- Cavernous sinus
- Development of Pharyngeal arches
- Development of Arterial arches
- Development of face & palate

Special senses:

- Tongue
- Eyeball
- Extraocular muscles
- External ear and middle ear
- Internal ear
- Development of eye
- Development of ear

Central nervous system:

- Spinal cord

- Cranial nerve nuclei
- Medulla
- Pons
- Midbrain
- Thalamus & Basal nuclei
- Gross features & White matter of cerebrum
- Cerebellum
- Ventricles of brain
- Blood supply of brain
- Development of Nervous system

10.1.2 (Theory SDL)

- Cervical sympathetic chain
- Pterygopalatine fossa
- Lymphatic drainage of neck
- Cross –section at C7
- Eyelid and lacrimal apparatus
- Blood-brain barrier & CSF circulation
- Circumventricular organs
- Lumbar puncture
- Limbic system

10.1.3 (Practical)

Gross Anatomy

Head & Neck

- Face-Muscles, vessels & Nerves
- Triangles of neck
- Parotid region
- Submandibular region
- Infratemporal fossa & muscles of mastication
- Pharynx
- Dural venous sinuses

Special senses

- Tongue & Eyeball
- Orbit
- Ear

Central Nervous System

- Spinal cord
- Brainstem
- Ventricles of brain
- Thalamus & Basal nuclei
- Cerebrum
- White fibers of cerebrum
- Cerebellum
- Radiology & Surface Anatomy

Osteology

- Skull
- Mandible & Cervical Vertebrae

Histology (2 hrs. /batch for Each topic)

- Tongue
- Cornea, optic nerve
- Retina
- Ear
- Spinal cord
- Medulla
- Pons & Midbrain
- Cerebrum & Cerebellum

10.2 PHYSIOLOGY CENTRAL NERVOUS SYSTEM, SPECIAL SENSES & INTEGRATIVE PHYSIOLOGY

10.2.1 (Theory)

- Functional organization of nervous system
- Synaptic transmission in CNS: and neurotransmitters
- Introduction to sensory system: physiology of receptors
- Sensory communication to spinal cord
- Ascending pathways
- Physiology of pain, itch and temperature

- The Thalamus
- The Sensory cortex
- Applied sensory physiology
- Introduction to and organization of motor system
- Segmental organization of motor system
- Muscle spindle and Golgi tendon organ
- The spinal reflexes
- Descending pathways
- Regulation of posture and movement
- Basal ganglia
- cerebellum
- Vestibular apparatus
- Functions of hypothalamus
- Reticular activating system, EEG and sleep
- Limbic system
- Physiology of learning and memory
- Physiology of language and speech
- Association cortex, cortical plasticity
- Functional anatomy of eye
- The image forming mechanisms
- Visual pathway and visual cortex
- Visual acuity, visual field
- Color vision
- Functional anatomy and functions of the ear
- The auditory pathways
- Mechanism of hearing
- Hearing defects and hearing tests
- Physiology of smell
- Physiology of taste

10.2.2 (Theory SDL)

- Trigeminal system
- CSF
- The photoreceptor mechanism

- Movements of eye

10.2.3 (Practical)

- Examination of motor system
- Reflexes
- Examination of sensory system
- Examination of cranial nerves (I - VI)
- Examination of cranial nerves (VII-XII)
- Perimetry

10.3 MOLECULAR BIOLOGY, CANCER BIOLOGY

10.3.1 (Theory)

- Nucleotide chemistry and metabolism, Gout
- Replication, transcription, translation, regulation of gene expression
- Tumor markers, oncogene, tumor suppressor
- Inhibitors of replication, transcription, translation

10.3.2 (Theory SDL)

- Interpretation of CSF analysis

10.3.3 (Practical)

- Demonstration of Electrophoresis, PCR, Western blotting

11. ADVANCED

11.1 ANATOMY

11.1.1 (Theory)

- Continuation of Central Nervous System

11.1.2 (Theory SDL)

- Continuation of Central Nervous System

11.1.3 (Practical)

- Continuation of Central Nervous System

11.2 PHYSIOLOGY

Continuation of Central Nervous System& Advanced

11.2.1 (Theory)

- Physiology of Yoga

- Physiology of Ageing
- Physiology of Temperature regulation
- Stem cell Physiology
- Physiological basis of stress
- Space physiology

11.2.2 (Theory SDL)

- Stem cell therapy

11.2.3 (Practical)

- Evoked potentials demonstration

11.3 BIOCHEMISTRY ADVANCES IN BIOCHEMISTRY

11.3.1 (Theory)

- Radioactivity, Human genome project, Genetic engineering
- Integrated metabolism
- Lab and molecular diagnostics

11.3.2 (Theory SDL)

- Personalized medicine

11.3.3 (Practical)

- Glucometer
- Dipsticks tests

List of Histology slides for Practical

General Histology			
Hyaline cartilage	Cardiac muscle	Mucous gland	Peripheral nerve H & E
Elastic cartilage	Large sized artery	Mixed gland	Peripheral nerve (Osmic acid stain)
Fibro cartilage	Medium sized artery	Lymph node	Spinal ganglion
Compact bone L.S	Medium sized vein	Spleen	Autonomic ganglion

Compact bone T.S	Large sized vein	Thymus	Thick skin
Skeletal muscle	Serous gland	Tonsil	Thin skin
Systemic Histology			
Oesophagus	Ureter	Epiglottis	Tongue – Circumvallate papillae
Stomach - Fundus	Urinary bladder	Trachea	Spinal cord – Cervical
Stomach – Pylorus	Adrenal gland	Lung	Spinal cord – Thoracic
Duodenum	Testis	Pituitary	Spinal cord – Lumbar
Jejunum	Epididymis	Thyroid	Spinal cord – Sacral
Ileum	Vas deferens	Parathyroid	Medulla – Pyramid level
Large intestine	Seminal vesicle	Cornea	Medulla - Sensory decussation level
Appendix	Prostate	Retina	Medulla - Mid olivary level
Liver	Penis	Optic nerve	Pons – Lower
Gall bladder	Ovary	Cochlea	Pons – Upper
Pancreas	Fallopian tube	Tongue – Filiform papillae	Midbrain – Inf.colliculus
Kidney	Uterus	Tongue – Fungiform papillae	Midbrain – Sup.colliculus

List of essential laboratory skills for independent performance**A. ANATOMY**

i. Marking surface anatomy

Students should be able to mark the following structures

LOCOMOTOR SYSTEM - UPPER LIMB		
Axillary artery	Deep palmar arch	Flexor retinaculum
Brachial artery	Median nerve	Extensor retinaculum
Radial artery	Radial nerve	Median cubital vein
Ulnar artery	Ulnar nerve	Cephalic vein
Superficial palmar arch	Axillary nerve	Anatomical snuff box

LOCOMOTOR SYSTEM - LOWER LIMB		
Femoral artery	Sciatic nerve	Great saphenous vein
Popliteal artery	Common peroneal nerve	Short saphenous vein
Anterior tibial artery	Deep peroneal nerve	Femoral vein
Posterior tibial artery	Superficial peroneal nerve	Inguinal ligament
Dorsalis pedis artery	Flexor retinaculum	Saphenous opening
Femoral nerve	Extensor retinaculum	Bryant's triangle

CARDIO-VASCULAR, RESPIRATORY SYSTEM AND ENDOCRINE SYSTEM		
Heart borders	Pulmonary auscultatory area	Borders of left lung
Mitral valve	Apex of heart	Fissures of right lung
Aortic valve	Arch of aorta	Fissure of left lung
Tricuspid valve	Superior vena cava	Sternal angle
Pulmonary valve	Rt & Lt Subclavian veins	Pleural reflection
Mitral auscultatory area	Rt & Lt Brachiocephalic veins	Thyroid gland
Aortic auscultatory area	Trachea	Right adrenal gland
Tricuspid auscultatory area	Borders of right lung	Left adrenal gland

GASTROINTESTINAL SYSTEM, & RENAL SYSTEMS		
Trans pyloric plane	Inguinal canal	McBurney's point
Subcostal plane	Stomach	Morrison's parallelogram
Trans tubercular plane	Liver	Abdominal aorta
Abdominal regions	Pancreas	Inferior vena cava
Superficial inguinal ring	Fundus of gall bladder	Root of mesentery
Deep inguinal ring	Base of appendix	Renal angle

HEAD & NECK AND NEUROANATOMY		
Internal jugular vein	Superficial temporal artery	Lateral sulcus
External jugular vein	Middle meningeal artery	Pterion
Common carotid artery	Facial artery	Parotid gland and duct
Internal carotid artery	Spinal accessory nerve	Submandibular gland
External carotid artery	Vagus nerve	Mastoid antrum (MacEwen triangle)

B. PHYSIOLOGY

i.	Collection of blood samples
ii.	Hemoglobin estimation
iii.	RBC count
iv.	Peripheral smear
v.	TLC / DLC
vi.	Blood grouping
vii.	BT/CT
viii.	Bedside tests of ANS function
ix.	Examination of Respiratory system

x.	Pulmonary function tests
xi.	ECG
xii.	Examination of Cardiovascular system
xiii.	Examination of abdomen
xiv.	Examination of the motor system
xv.	Examination of the sensory system
xvi.	Examination of cranial nerves

C. BIOCHEMISTRY

i.	Urine analysis
ii.	Glucometer
iii.	Dipstick tests

E. LEARNING RESOURCE MATERIALS FOR STUDENTS

1. ANATOMY

S/No.	Title of the book	Author/Editor
GENERAL ANATOMY		
1	General Anatomy-Elsevier	Vishram Singh
2	Hand book of General Anatomy-CBS publishers	BD Chaurasia
GROSS ANATOMY – TEXTBOOK		
1	Gray’s Anatomy for Students. South Asia Edn- Elsevier. 2017.	Raveendranath V. et al
2	Clinically Oriented Anatomy. Wolter Kluwer.	Moore K.L, Dalley A.F, Agur A.M
3	Clinical Anatomy: A Problem Solving Approach. Jaypee Brothers Medical Publishers Private Limited; (vol. 1 & 2)	Kulkarni V.N
4	Human Anatomy: Regional & Applied.CBS Publishers: (Vol. I,II,III)	BD Chaurasia’s
SURFACE & RADIOLOGICAL ANATOMY		
1	Surface & Radiological Anatomy.CBS Publishers.	A. Halim
GROSS ANATOMY – ATLAS		
1	Atlas of Anatomy (Thieme Anatomy) .Thieme Medical Publishers Inc.	Gilroy A.M, Ross L.M, Mac Pherson B. R. Schuenke M, Schutle E, Schumacher U
2	Grant’s Atlas of Anatomy. Wolter Kluwer	Agur A.M, Dalley A.F
3	Atlas of Human Anatomy. Elsevier.	Netter.
GROSS ANATOMY- DISSECTION MANUAL		
1	Thieme dissector-Thieme Medical publishers (Three volumes)	Vishramsingh, GP Pal, SD Gangane
2	Cunningham’s Manual of Practical Anatomy – Oxford;(Vol. 1, 2 & 3)	RachelKoshi.
3	Dissection Manual with Regions & Applied Anatomy – Japee publishers-Volume 1, 2 & 3	Mercy Davis
HISTOLOGY		
1	Di Fiore’s. Atlas of Histology: With Functional Correlations- Lippincott Williams and Wilkins.	Eroschenko V.P,
2	Inderbir Singh’s Textbook of Human Histology with Colour Atlas and Practical Guide-Jaypee Brothers Medical Publishers Private Limited.	Neelam V.
EMBRYOLOGY		
1	Text book of Human Embryology - CBS Publishers	Yogesh Sontakke
2	Human Embryology. Jaypee Brothers Medical Publishers Private Limited.	Singh I.B.
3	Medical Embryology. Wolter Kluwer.	Langman S.

NEUROANATOMY		
S/No.	Title of the book	Author/Editor
1.	Neuroanatomy for Medical Students - Lippincott Wolters Kluwer	G P Pal
2.	Textbook of Clinical Neuroanatomy- Elsevier.	Vishram Singh
3.	Clinical Neuroanatomy- Lippincott Williams and Wilkins.	Snell R.S
GENETICS		
1.	Principles of Clinical Genetics - JAYPEE Brothers	YogeshSontakke
POST NATAL GROWTH AND DEVELOPMENT		
1.	Manual - WHO Project IND/MCH/003/1984-85.	
DICTIONARY		
1.	Dorland's pocket medical dictionary-Elsevier	

2. PHYSIOLOGY

S/No.	Title of the book	Author/Editor
TEXT BOOK		
1.	Ganong's Review of Medical Physiology, 25 th edition	Boitano S, Brooks H, Barman SM, Barrett KE.
2.	Guyton and Hall Textbook of Medical Physiology. 13 th edition	Hall JE
3.	Comprehensive Textbook of Medical Physiology –Two volumes	G K Pal Pravai Pal Nivedita Nanda
4.	Best & Taylor's Physiological Basis of Medical Practice, 13 th edition	Tandon OP, Tripathi Y
5.	Understanding Medical Physiology: A Textbook for Medical Students. 4 th edition	Bijlani RL, Manjunatha S
PRACTICAL		
1.	Textbook of Practical Physiology – 4 th Edition	G K Pal
2.	A Textbook of Practical Physiology. 8 th edition	Ghai CL.

3. BIOCHEMISTRY

Title of the book	Author/Editor
TEXT BOOK	
Harper's Illustrated Biochemistry, 30 th edition	R.K. Murray, D.K. Granner, P.A. Mayes and V.W. Rodwell
Lippincott's Illustrated Reviews: Biochemistry, 4 th edition	Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier
Text book of Medical Biochemistry, 6 th edition	DM Vasudevan
Text book of Medical Biochemistry, 3 rd edition	Dinesh Puri
REFERENCE BOOK	
Principles and Techniques of Biochemistry and Molecular Biology, 7 th edition	Wilson, K. & Walker, J
Principles of Biochemistry, 6 th edition.	Albert L. Lehninger
Mark's Basic Medical Biochemistry – A Clinical Approach 5 th edition	Michael Liberman Alisa Peet