SECTION – I
(Course content)

GENERAL ANATOMY

Lecture Demonstrations: 08 hrs
Practicals: Nil

TOPICS

1.

Introduction:
1 hr

- Subdivisions of Anatomy
- Nomenclature:
  - Terms used for describing the position of the body:
    Anatomical, supine, prone, lithotomy
  - Anatomical planes:
    Median or sagittal, coronal, transverse, oblique
  - Terms in Gross anatomy:
    Anterior, posterior, superior, inferior, medial, lateral
  - Terms in Embryology:
    Ventral, dorsal, cranial/ cephalic/ rostral, caudal
  - Terms related to the limbs:
    Proximal, distal, radial, ulnar, tibial, fibular, preaxial and postaxial borders, flexor, extensor, palmar and plantar surfaces.
  - Terms used for hollow organs:
    Interior, exterior, invagination, evagination
  - Terms used for solid organs: Superficial, deep
  - Terms used to indicate the side of the body: Ipsilateral, contralateral
  - Terms used describing the muscles: Attachment, origin, insertion,
  - belly, tendon, aponeurosis, raphe.
  - Terms used for describing the movements:
    Flexion, extension, adduction, abduction, medial rotation, lateral rotation,circumduction, pronation, supination, inversion, eversion. Plantar flexion, dorsiflexion, protraction, retraction, opposition.

2. Skin and subcutaneous tissue:
hr

Superficial fascia
Deep fascia

3. Skeletal muscles:
hr

Features
Nomenclature
Blood supply

Nerve supply
Action
Classification of muscle groups
Applied anatomy

Tendon
Aponeurosis

4. Cartilage:
hr

- Hyaline
- Elastic
- Fibro

5. Bone:
hr

- General: Exoskeleton, examples- remains of it in humans
- Endoskeleton: Functions
- Classification:
  Morphological: long, short, miniature, flat, irregular
  pneumatic, sesamoid
  Structural: compact, cancellous
  Developmental: membranous, cartilaginous
  Microscopic: lamellar, Non-lamellar
  Regional: axial, appendicular

- Long bone:
  Parts: diaphysis, metaphysis, epiphysis
  Types of epiphyses: pressure, traction, atavistic
  Blood supply to a long bone
  General concepts of ossification:
  Primary centre, secondary centre,
  medico-legal importance, age, sex and height.

6. Joints: Classification, features and examples: 1 hr

- Based on movements
- Based on axes of movements- uniaxial, biaxial, polyaxial
- Based on the tissue intervening between the bones:
  Fibrous: - sutures
  -syndesmosis
  -gomphosis

  Cartilaginous -primary }
  -secondary } synarthrosis (solid)

Synovial -simple }
-compound } diathrosis (cavitated)
-complex }

- Based on morphology:
  Simple: one pair of male and female surfaces
  Compound: more than one pair of surfaces
  Complex: with intracapsular menisci or articular disc

7. Blood vessels and lymphatics:

hr

- Artery, arteriole anfd capillaries
- Vein, venules and capillaries
- Anastomosis: arterio-arterial; veno-venous; arterio-venous
- Lymphatics: lymph channels and lymph nodes

8. Nervous system: Central and peripheral- an overview:

- Components
- Functions

SECTION - II
(Course Content under Level – I, II, III)

S.NO	TOPIC	LEVEL 1	LEVEL 2	LEVEL3
1.	**SUBDIVISIONS**	• Gross Anatomy • Neuroanatomy • Histology • Embryology		
2.	**NOMENCLATURE**	• Terms used in describing the position of the body: anatomical, prone, supine, lithotomy • Anatomical planes: Median/ Sagittal; Parasagittal, Coronal, Transverse, Oblique • Terms related to the limbs: proximal, distal; radial, ulnar; tibial, fibular; preaxial, postaxial; flexor, extensor; palmar and plantar surfaces		

		• Terms used for hollow organs: Interior, exterior; invagination, evagination • Terms used for solid organs: superficial, deep • Terms used for describing the muscles: Attachment: origin, insertion; belly, tendon; aponeurosis; raphe • Terms used for describing the movements: Flexion, extension; adduction, abduction; medial rotation, lateral rotation; circumduction; pronation, supination; inversion, eversion; plantar flexion, dorsiflexion; protraction, retraction; opposition.		
3.	**SKIN**	• Major organ- surface area: 1.2 to 2 sq. metres • Types: Hairy, Non-hairy • Structure and parts: Dermis & Epidermis • Dermatomes: Definition; Dermatomes of the trunk, superior and inferior extremities; Axial lines	• Structure & functional correlation • Tension lines, flexor lines, papillary ridges • Appendages: Nails, Hair, sweat glands; Sebaceous glands • Applied anatomy of dermatomes	• Structure & functional correlation • Clinical correlation • Significance of Langer's lines • Skin grafts
4.	**SUBCUTANEOUS TISSUE**	1. Superficial Fascia: Definition 2. Distribution of fat, important structures, functions 3. Subcutaneous skeletal muscle- panniculus carnosus 4. Deep Fascia: Definition Distribution, features, modifications, functions	• Structural and functional correlations of superficial and deep fascia	• Applied and comparative anatomy • Calf pump

		5. Retinaculum		
5.	**MUSCLES (SKELETAL)**	• Types: skeletal, smooth & cardiac • Origin, Insertion 6. Morphological classification: Parallel fasciculi, Oblique fasciculi, Spiral fasciculi 7. Features 8. Blood supply 9. Nerve supply 10. Neuromuscular junction 11. Actions of muscles: Isometric, Isotonic, Concentric, Eccentric 12. Functional classification: Prime movers, Fixators, Antagonists, Synergists 13. Tendon 14. Aponeurosis	• Power of muscles; Range of contraction; Active insufficiency, Passive insufficiency; Structure and functional correlation	• Body lever systems • Kinesiology
6.	**CARTILAGE**	• Definition; Types; Structure; Distribtuion	• Nutrition; Synthesis; Growth; Histogenesis;	• Grafts
7.	**BONE**	1. General: Exoskeleton-examples of remanats of it in humans • Endoskeleton 2. Classification: Morphological : Long, short, miniature long bone, flat, irregular, pneumatic, accessory, sesamoid • Structural: Compact & spongy • Developmental: Membranous & Cartilaginous • Microscopic: Lamellar & Non-lamellar • Regional Axial & appendicular 3. Distribution & functions of bone 4. Structure of a long bone 5. Parts of a long bone: Diaphysis, metaphysis & epiphysis 6. Types of epiphysis: Pressure, traction, atavistic, composite,	• Nutrition • Mechanical properties	• Efects of hormones on growth • Stresses and strain (Wolff's law) • Effects of radiation on the bones • Why metastasis occur in the bone?

		compound, aberrant 7. Blood supply to the long bone 8. Ossification: general concepts; primary & secondary centres; Laws of ossification; Factors concerned with the growth of a long bone; 9. Medicolegal importance of bones: age, sex, height, injuries, poisoning, causes of death, superimposition of skull X-ray and photograph		
8.	**JOINTS**	• <u>Definition</u>: Union of skeletal elements • <u>Classification</u>: 1. Based on movements 2. Based on axes of movements- Uniaxial, biaxial, multiaxial 3. Based on the tissue intervening between the bones: Fibrous: sutures, syndesmosis & gomphosis 4. Cartilaginous: Primary & secondary 5. Synovial (cavitated)/ Diarthroses : simple- One pair, male and female surfaces 6. Compound: More than one pair of articualr surfaces 7. Complex: with the intracapsular menisci, articular disc 8. According to the shape of the articular surfaces: Plane, Ball & Socket, Hinge, Pivot, Ellipsoid, Pivot, Saddle, Bicondylar 9. Blood supply and nerve supply to the joints.	10. Factors limiting range of movements 11. Surface topology of articular surfaces: Ovoid, sellar, 12. Types of movements: Spin, Swing - pure (cardinal), Impure (arcuate assoicated with spin) 13. Kinesiology: Sellar, Ovoid 14. Types of movements: Translation, Rotation, Angulation 15. Joint position: Loose-packed, Close-packed	

9	**BLOOD VESSELS & LYMPHATICS**	• Arteries: types • Arterioles & capillaries: continuous & fenestrated; sinusoids • Veins, venules and venous capillaries • Groups of veins: caval, portal, azygos paravertebral & emissary • Anastomosis: Interarterial, arteriovenous • Collateral circulation • Functional end arteris; End artery • Vasa vasorum • Nerve supply to the blood vessels • Glomus (subungual) • **LYMPHATICS**: Definition; drainage system accessory to the venous system • Components: Lymph vessels, Lymphoid tissue- Central & Peripheral lymphoid organs; Circulating lymphocytes- T & B lymphocytes. • Functions of the lymphatic system	• Gradient of blood pressure in different vessels • Applied anatomy of the lymphatic system • Infections	• Arteriosclerosis • Ischemia • Infarct
10.	**NERVES**	• Structure of nerve and supporting tissue • Neuron: Soma, axon, dendrites, myelin & myelination, myelin sheath • Synapses: Type I & II • Synapses: Functional classification- excitatory & inhibitory • Parts of the nervous system: PNS & CNS • Peripheral nerves: Cranial- 12 pairs, Spinal- 31 pairs • Structure of a typical spinal nerve: rootlets, roots, trunk, dorsal &	• Functional correlation	• Nerve injuries, Regeneration & Reflexes

		ventral rami; plexuses • CNS: Brainstem, cerebellum, Thalamic complex, Cerebral hemispheres • ANS: Sympathetic-thoracolumbar outflow; sympathetic ganglia; grey & white rami communicantes; Preganglionic & postganglionic fibres; periarterial plexuses; splanchnic ganglia & splanchnic nerves • ANS: Parasympathetic-craniaosacral outflow.		
11	**FUNCTIONAL ANATOMY**	• Posture: Definition, types; Line of gravity; Weight transmission; Maintenance of posture; postural muscles • Vertebral column: Formation; joints & ligaments; Intervertebral disc: structure, nucleus pulposus & annulus fibrosus; normal curvatures- primary & secondary; Abnormal curvatures- kyphosis, scoliosis, lordosis, kyphoscoliosis. • Grips of the hand: Power, precision, hook, pincer; simultaneous power & precision grip; Complex manipulation • Walking: Gait / walking cycle; stance phase; swing phase • Anatomy of speech: Organs involved in speech; Production of sound and articulation. .		• Joint and lever comparison • Applied: Prolapse of the IV Disc • Day to day use of hand • Indispensable parts of the hand