Overall Course Objective
On completion of the 1st year of medical school all students are expected to be well versed in anatomico-medical terminology as it applies to all aspects of human gross anatomy. The combined didactic and practical components of the course should enable the student to comprehend the three-dimensional form and function of the human body. In addition, students will have a firm understanding of the location, relative size, shape, important spatial relationships, nerve and blood supply, and lymphatic drainage for anatomical structures. Using the acquired fund of anatomical knowledge each student will be capable of understanding basic clinical conditions as they relate to specific structures or systems.

Core Curriculum Content Overview

Introduction
I. Anatomical Principles
II. Anatomical Systems

Back
I. Vertebral Column
II. Muscles of the Back
III. Spinal Cord and Meninges

Breast and Pectoral Region
I. Breast/Mammary Gland
II. Pectoral Region

Upper Limb
I. Osteology
II. Shoulder Region
III. Axilla
IV. Arm
V. Forearm
VI. Hand

Thorax
I. Thoracic Wall
II. Pectoral Region
III. Intercostal Spaces
IV. Thoracic Cavity and Viscera
Abdomen
I. Bony Landmarks, Planes, and Quadrants
II. Anterior Abdominal Wall
III. Inguinal Canal and Hernias
IV. Scrotum, Spermatic Cord, and Testis
V. Peritoneum, Peritoneal Reflections, and Peritoneal Cavity
VI. Abdominal Organs In Situ
VII. Physical Examination of the Abdomen
VIII. Referred Abdominal Pain
IX. Abdominal Organs – Detailed Examination

Pelvis
I. Osteology
II. Pelvic Viscera

Perineum
I. Boundaries and Triangles
II. Contents of Urogenital and Anal Triangles

Lower Limb
I. Osteology
II. Thigh
III. Gluteal Region
IV. Leg
V. Foot
VI. Joints of Lower Limb
VII. Arches of the Foot

Neck
I. Surface Anatomy
II. Skin and Fasciae of the Neck
III. Triangles of the Neck
IV. Muscles of the Neck
V. Nerves of the Neck
VI. Vessels of the Neck
VII. Lymphatics of the Neck
VIII. Thyroid and Parathyroid Glands
IX. Trachea and Esophagus
Head

I. Osteology of the Skull
II. Face
III. Scalp
IV. Parotid Gland
V. Temporal and Infratemporal Fossae
VI. Cranial Meninges, Dural Folds, and Dural Venous Sinuses
VII. The Orbit
VIII. The Pterygopalatine Fossa, Nasal Cavity, and Paranasal Sinuses
IX. The Pharynx
X. Soft Palate
XI. The Oral Cavity
XII. The Larynx
XIII. The Ear – External and Middle
Introduction
I. Anatomical Principles
   A. Anatomy (definition)
   B. Variation
   C. Three-dimensional visualization
   D. Surface anatomy
   E. Terminology

II. Anatomical Systems
   A. Nervous system
      1. Central nervous system (CNS)
      2. Peripheral nervous system (PNS)
   B. Muscular system
      1. Skeletal muscle (tendons, deep fascia)
      2. Smooth muscle
      3. Cardiac muscle
   C. Skeletal system
      1. Bones
         a. Axial skeleton
         b. Appendicular skeleton
      2. Joints
         a. Synovial
         b. Cartilaginous
         c. Fibrous
   D. Circulatory system
      1. Cardiovascular system
         a. Heart
         b. Blood vessels: arteries, veins, capillaries
      2. Lymphatic system
         a. Lymphatic vessels
         b. Lymph nodes
   E. Digestive system
   F. Respiratory system
   G. Urinary system
   H. Endocrine system
Back
I. Vertebral column
   A. Vertebrae and regions of vertebral column
   B. Curvatures
      1. Normal curves
      2. Abnormal curves
   C. Parts of a typical vertebra
      1. Body
      2. Vertebral arch
      3. Vertebral foramen/canal
      4. Processes
   D. Regional characteristics of vertebrae
      1. Cervical (7)
      2. Thoracic (12)
      3. Lumbar (5)
      4. Sacrum
      5. Coccyx
   E. Joints of the vertebral column
      1. Synovial joints
      2. Fibrocartilaginous (symphyseal) joints
   F. Ligaments of the vertebral column
      1. Anterior longitudinal ligament
      2. Posterior longitudinal ligament
      3. Ligamentum flava
      4. Interspinous ligament
      5. Supraspinous ligament
   G. Movements of the vertebral column
      1. Flexion
      2. Extension
      3. Lateral flexion
      4. Rotation

II. Muscles of the Back
   A. Superficial back muscles
   B. Intermediate back muscles [serratus posterior superior and inferior]
   C. Deep back muscles

III. Spinal Cord and Meninges
   A. Spinal cord
   B. Spinal nerves (31 pairs): 8 cervical, 12 thoracic, 5 lumbar, 5 sacral, 1 coccygeal.
   C. Meninges – connective tissue coverings of the spinal cord and brain
      1. Dura mater
      2. Arachnoid mater
      3. Pia mater
   D. Meningeal spaces
      1. Epidural or extradural space
      2. Subdural space
3. Subarachnoid space
E. Vertebral venous plexus

Breast and Pectoral Region
I. Breast/Mammary gland
   A. Adult female breast
      1. Boundaries
      2. Quadrants
      3. Components
      5. Vascular supply
      6. Lymphatic drainage
         a. Axillary lymph nodes
         b. Parasternal lymph nodes

II. Pectoral Region
   A. Muscles
      1. Pectoralis major
      2. Pectoralis minor
      3. Serratus anterior
   B. Nerves
      1. Lateral pectoral nerve (C5,6,7)
      2. Medial pectoral nerve (C8,T1)
      3. Long thoracic nerve
   C. Vessels
      1. Thoracoacromial artery
      2. Lateral thoracic artery
      3. Veins accompanying these arteries are tributary to the axillary vein
Upper Limb
I. Osteology
   A. Pectoral girdle – Bony landmarks associated with each:
      1. Clavicle
      2. Scapula
      3. Humerus
   B. Bones of the forearm
      1. Radius
      2. Ulna
   C. Bones of the hand
      1. Carpals (8)
      2. Metacarpals (5)
      3. Phalanges (14): proximal, middle, and distal (no middle phalanx in the thumb)

II. Shoulder Region
   A. Muscles – attachments, actions, and innervation
      1. Trapezius
      2. Latissimus dorsi
      3. Levator scapulae
      4. Rhomboideus minor and major
      5. Deltoid
      6. Supraspinatus
      7. Infraspinatus
      8. Teres minor
      9. Teres major
      10. Subscapularis
   B. Shoulder or Glenohumeral joint
      1. Articular components
         a. Bones
         b. Fibrous joint capsule
         c. Rotator cuff musculature (musculotendinous cuff)
      2. Ligaments/Tendons
      3. Bursae
      4. Movements of the shoulder joint

III. Axilla
   A. Boundaries and contents
   B. Vessels
      1. Axillary artery and branches
      2. Axillary vein and tributaries
      3. Lymphatics and axillary lymph nodes
   C. Brachial plexus
      1. Roots
      2. Trunks
      3. Divisions
      4. Cords and branches
IV. Arm
A. Anatomically, that part of the upper limb between the shoulder and elbow
B. Contents:
   1. Skin – sensory (dermatome) supply
   2. Superficial fascia
      a. Cutaneous nerves
      b. Superficial veins
   3. Deep fascia
   4. Bone
      a. Humerus
   5. Muscles – attachments, actions, innervation
      a. Anterior/Flexor compartment
      b. Posterior/Extensor compartment
   6. Nerves
      a. Musculocutaneous nerve (C5,C6,C7)
      b. Ulnar nerve (C8, T1)
      c. Median nerve (C5-C8, T1)
      d. Radial nerve (C5-C8, T1)
   7. Vessels
      a. Brachial artery
      b. Deep veins – venae committantes

V. Forearm
A. Anatomically, that part of the upper limb between the elbow and wrist
B. Contents:
   1. Skin – sensory (dermatome) supply
   2. Superficial fascia
      a. Cutaneous nerves
      b. Superficial veins
   3. Deep fascia (antebrachial fascia)
   4. Bones
      a. Radius
      b. Ulna
      c. Interosseous membrane
   5. Muscles – attachments, actions, innervation
      a. Anterior/Flexor-pronator compartment – Superficial layer:
      b. Anterior/Flexor-pronator compartment – Deep layer:
      c. Posterior/Extensor-supinator compartment – Superficial layer:
      d. Posterior/Extensor-supinator compartment – Deep layer:
   6. Nerves
      a. Median nerve
      b. Ulnar nerve
      c. Radial nerve
   7. Vessels and branches/tributaries
      a. Radial artery
      b. Ulnar artery
      c. Veins
C. Cubital fossa
   1. Boundaries
   2. Contents (medial to lateral) – median nerve, brachial artery, biceps brachii tendon, radial nerve

D. Elbow joint

E. Wrist or Radiocarpal joint
   1. Carpal bones: proximal row – scaphoid, lunate, triquetrum, pisiform; distal row – trapezium, trapezoid, capitate, hamate

VI. Hand
   A. Skeleton of the hand
   B. Movement of the fingers and thumb
   C. Contents of the hand:
      1. Skin
         a. Dermatome supply
      2. Superficial fascia
         a. Cutaneous nerves
         b. Superficial veins
      3. Deep fascia (palmar fascia), fibrous digital sheaths, and bursae
      4. Bones
      5. Muscles (Intrinsic muscles – “begin and end” in the hand)
         a. Thenar muscles
         b. Hypothenar muscles
         c. Adductor pollicis
         d. Lumbricals
         e. Interossei
      6. Nerves
         a. Median nerve
         b. Ulnar nerve
         c. Radial nerve
      7. Vessels and palmar arterial arches
Thorax

I. Thoracic Wall
   A. Skeleton of the thoracic wall
      1. Thoracic vertebrae
      2. Ribs (12 pairs) – classifications and parts
      3. Sternum
   B. Apertures of the thorax
   C. Surface projection of imaginary craniocaudal lines

II. Pectoral Region
   A. Muscles – attachments, actions, innervation
      1. Pectoralis major
      2. Pectoralis minor
      3. Serratus anterior
   B. Nerves
      1. Lateral pectoral nerve
      2. Medial pectoral nerve
      3. Long thoracic nerve
   C. Vessels
      1. Thoracoacromial artery
      2. Lateral thoracic artery
      3. Veins accompanying these arteries are tributary to the axillary vein

III. Intercostal Spaces
   A. Intercostal muscles – layers from superficial to deep:
   B. Intercostal nerves
   C. Intercostal vessels
      1. Arteries
      2. Veins

IV. Thoracic Cavity and Viscera
   A. Thoracic cavity
      1. Pulmonary cavities
      2. Mediastinum
   B. Pulmonary cavities
      1. Pleural cavity
      2. Pleurae
      3. Lungs – surfaces, lobes, fissures, and impressions
      4. Surface projections of the pleural cavities and lungs
      5. Pleural recesses
      7. Innervation and blood supply of the pleurae
      8. Respiration
      9. Trachea, bronchi and divisions
     10. Vasculature of the lungs
     11. Lymphatics of the lung
     12. Innervation of the bronchial tree
   C. Mediastinum – General description and overview
1. Superior mediastinum
2. Inferior mediastinum and subdivisions

D. Middle mediastinum
1. Pericardial sac
2. Heart – External anatomy
3. Heart – Blood supply
   a. Coronary arteries
   b. Cardiac veins
4. Heart – Internal anatomy
5. Heart valves
6. Auscultation of heart sounds
7. Blood flow through the chambers of the heart
8. Conducting system of the heart
9. Innervation of the heart

E. Superior mediastinum (contents and relationships)
1. Thymus
2. Trachea and esophagus
3. Aortic arch
4. Brachiocephalic veins
5. Superior vena cava
6. Vagus nerves (CN X)
7. Phrenic nerves

F. Posterior mediastinum (contents and relationships)
1. Thoracic (descending) aorta and branches
2. Esophagus
   a. Constrictions
   b. Arterial supply
   c. Venous drainage
   d. Innervation
      i. Esophageal plexus
3. Azygos venous system
4. Thoracic duct
5. Sympathetic trunks – white and gray rami communicantes
6. Greater, lesser, least thoracic splanchnic nerves
Abdomen

I. Abdominal Cavity
   A. Musculoskeletal landmarks
   B. Planes and quadrants of the abdomen

II. Anterior Abdominal Wall
   A. Layers of the anterior abdominal wall
   B. Vessels on the anterior abdominal wall
   C. Nerves and dermatomes of the anterior abdominal wall
   D. Muscles of the anterior abdominal wall – attachments, actions, innervation
   E. Inner surface and peritoneal folds of the anterior abdominal wall

III. Inguinal Canal and Hernias
   A. Inguinal canal - superficial and deep inguinal rings
   B. Inguinal (Hesselbach’s) triangle
   C. Hernias
      1. Inguinal
         a. Direct inguinal hernia
         b. Indirect inguinal hernia
      2. Femoral
      3. Umbilical

IV. Scrotum, Spermatic Cord, and Testis
   A. Scrotum
   B. Spermatic cord
      1. Fascial coverings or layers
      2. Spermatic cord contents
   C. Testis and associated structures
      1. Testis (testicle)
      2. Epididymis
      3. Tunica vaginalis

V. Peritoneum, Peritoneal Reflections, and Peritoneal Cavity
   A. Peritoneum
      1. Parietal peritoneum
      2. Visceral peritoneum
   B. Peritoneal reflections
   C. Peritoneal cavity

VI. Abdominal Organs In Situ
   A. Abdominal cavity – divided into two spaces by the transverse colon
   B. Overview of abdominopelvic portion of GI tract – proximal to distal
      1. Esophagus
      2. Stomach
      3. Small intestine
      4. Large intestine
VII. Physical Examination of the Abdomen
   A. Methods of assessment
      1. Inspection
      2. Palpation
      3. Percussion
      4. Auscultation
   B. Liver exam
   C. Gallbladder exam
   D. Spleen exam
   E. Kidney exam

VIII. Referred Abdominal Pain
   A. Three conditions that generate pain in abdominal viscera
      1. Ischemia
      2. Distention
      3. Contraction
   B. Visceral pain - dull, and poorly localized
   C. Three general areas of referred pain onto the anterior abdominal wall
      1. Epigastric region
      2. Umbilical region
      3. Hypogastric region
   D. Organ-specific pain referral
      1. Esophagus
      2. Heart
      3. Gallbladder
      4. Stomach
      5. Kidney/ureter
      6. Pancreas
      7. Appendix
      8. Uterus/rectum
      9. Urinary bladder

IX. Abdominal Organs – Detailed Examination
   A. General wall structure of gastrointestinal organs
   B. Diaphragm
      1. Contains three openings for structures to pass through it: IVC, esophagus, aorta
      2. Phrenic nerves (C3,4,5)
   C. Esophagus
      1. A muscular tube which begins at the C6 level in the neck as a continuation of the pharynx.
      2. Descends through the thorax and passes through the esophageal hiatus at the T10 level to connect to the cardia of the stomach
      3. Three sites of narrowing along the esophagus
      4. Layers
      5. Esophageal disorders
   D. Stomach
      1. A “J”-shaped organ that varies in shape and size according to one’s caloric intake
2. Parts or regions:
3. Layers
4. Factors increasing gastric activity
5. Peptic ulcers

E. General GI symptoms associated with problems in the foregut, midgut, and hindgut
1. Foregut (liver, spleen, stomach, upper half of duodenum)
   a. Vomiting
2. Midgut (lower half of duodenum, jejunum, ileum, right colon)
   a. Vomiting and distention
3. Hindgut (left colon, sigmoid colon, rectum, anal canal)
   a. Distention

F. Arterial supply of the stomach

G. Liver
1. Liver – Lobes and surfaces
2. Hepatic portal venous system
3. Hepatic blood supply
4. Hepatic lobule
5. Sites (4) of porto-caval anastomoses:
6. Sites of blockage of venous blood flow through the liver:
7. Radiologic assessment of the venous system for evidence of blockage
8. Treatment of hepatic blockages

H. Biliary system (gallbladder and its ducts)
1. Bile production
2. Gallbladder – parts and biliary duct system
3. Second part of the duodenum – entrance for common bile duct and main pancreatic duct
4. Gallstones

I. Pancreas
1. Regions
2. Pancreatic duct patterns and frequencies
3. Exocrine and endocrine function
4. Pancreatic cancer
5. Referred pancreatic pain

J. Small Intestine
1. Duodenum
2. Jejunum
3. Ileum

K. Large Intestine
1. Principal morphologic features
2. Blood supply to small and large intestine

L. Clinical Note:
1. Meckel’s diverticulum
2. Appendicitis
3. Ileocolic intussusception
4. Volvulus
5. Diverticulosis
6. Megacolon or Hirschsprung’s disease
7. Cancer of the GI tract – common sites

M. Kidney
   1. Morphology and internal structure
   2. Renal pelvis and ureter
   3. Renal fat and fascia
   4. Blood supply
   5. Clinical Note:
      a. Horseshoe kidney
      b. Multiple (2-4) renal arteries
      c. Pelvic kidney
      d. Bifid ureters
      e. Retrocaval ureter

N. Abdominal aorta and branches
O. Inferior vena cava and tributaries
Pelvis

I. Osteology

A. Bony pelvis – bony landmarks:
   1. Ilium
   2. Ischium
   3. Pubis
   4. Sacrum
   5. Coccyx

B. Pelvic inlet and diameters

C. Pelvic outlet and diameters

D. Pelvic cavity (true pelvis)
   1. Pelvic walls
   2. Pelvic floor – pelvic diaphragm
   3. Pelvic measurements
   4. Orientation of pelvis
   5. Pelvic axis
   6. False (greater/pelvis major) pelvis
   7. True (lesser/pelvis minor) pelvis
   8. Pelvic types
   9. Sexual differences in the pelves

II. Pelvic viscera – relationships, blood supply, lymphatic drainage

A. Viscera
   1. Urinary bladder
   2. Rectum – continuous with the sigmoid colon and ends at the anus

B. Female viscera
   1. Ovaries
   2. Uterine tubes (Fallopian tubes)
   3. Uterus
   4. Vagina

C. Male viscera
   1. Prostate
   2. Seminal vesicles
   3. Ductus deferens (Vas deferens)
   4. Ejaculatory duct
**Perineum**

I. Diamond-shaped region inferior to the pelvic floor
   A. Boundaries
   B. Triangles
   1. Urogenital (UG) triangle and perineal spaces
      a. Male urogenital diaphragm
      b. Female urogenital diaphragm
   2. Anal triangle
   3. External genitalia and associated structures
      a. Male
      b. Female
   4. Vascular supply of the perineum
   5. Lymphatic drainage of the perineum
   6. Nerve supply to the perineum
**Lower Limb**

I. Osteology
   A. Pelvic (Hip) bone – bony landmarks
      1. Ilium
      2. Ischium
      3. Pubis
   B. Pelvic girdle
   C. Femur – bony landmarks
   D. Patella (“knee-cap”)
   E. Bones of the leg
      1. Tibia (weight-bearing) – bony landmarks
      2. Fibula (non-weight bearing) – bony landmarks
   F. Bones of the foot
      1. Tarsals (7)
      2. Metatarsals (5)
      3. Phalanges (14)

II. Thigh
   A. Anatomically, that part of the lower limb between the hip and knee
   B. Contents:
      1. Skin
      2. Superficial fascia
      3. Deep fascia – fascia lata
      4. Bone
         a. Femur
      5. Blood supply
   C. Muscles and compartments
      1. Anterior compartment of the thigh
         a. Muscles – as a group: primary action is to flex the hip and extend the knee; each is innervated by the femoral nerve (L2,3,4)
      2. Medial compartment of the thigh
         a. Muscles – as a group: primary action is to adduct the thigh; each is innervated by the obturator nerve (L2,3,4)
      4. Posterior compartment of the thigh
         a. Muscles (“Hamstrings”) – as a group: primary action is to extend the thigh and flex the leg; each is innervated by the tibial portion of the sciatic nerve, except the short head of biceps femoris (innervated by common fibular (peroneal) portion of sciatic nerve)
   D. Femoral triangle, adductor canal, and popliteal fossa

III. Gluteal region
   A. Bony landmarks
   B. Ligaments
      1. Sacrospinous ligament
      2. Sacrotuberous ligament
   C. Muscles – attachments, action, innervation
      1. Gluteal muscles
2. Lateral rotators

D. Blood supply
   1. Superior gluteal artery
   2. Inferior gluteal artery
   3. Internal pudendal artery

E. Nerves
   1. Superior gluteal nerve (L4,L5,S1)
   2. Inferior gluteal nerve (L5,S1,S2)
   3. Sciatic nerve (L4-S3)
   4. Posterior femoral cutaneous nerve (S1,2,3)
   5. Pudendal nerve (S2,3,4)

IV. Leg
   A. Anatomically, that part of the lower limb between the knee and ankle
   B. Contents:
      1. Skin
      2. Superficial fascia
         a. Cutaneous nerves
         b. Superficial veins
      3. Deep (crural) fascia
      4. Bones
         a. Tibia
         b. Fibula
      5. Blood supply
         a. Popliteal artery and branches
         b. Deep veins – venae comitantes; accompany their corresponding arteries
   B. Muscles and compartments
      1. Anterior compartment of the leg
         a. Muscles – as a group: primary action is extension of digits and dorsiflexion at the talo-crural (ankle) joint; each is innervated by the deep fibular (peroneal) nerve (L4-S1)
         b. Blood supply – anterior tibial artery
      2. Lateral compartment of the leg
         a. Muscles – as a group: primary action is to evert the foot; each is innervated by the superficial fibular (peroneal) nerve (L5-S2)
         b. Blood supply – perforating branches from the fibular (peroneal) artery
      3. Posterior compartment of the leg
         a. Superficial group of muscles – primary action is plantarflexion of foot
         b. Deep group of muscles – primary action is plantarflexion of the foot and flexion of the digits
         c. Blood supply – posterior tibial and fibular (peroneal) arteries
         d. Nerve supply – tibial nerve (L4-S3)

V. Foot
   A. Dorsum of the foot
      1. Skin – thin and mobile
      2. Superficial fascia
a. Cutaneous nerves
b. Dorsal venous arch

3. Blood supply
   a. Dorsalis pedis artery

4. Muscles of the dorsum of the foot – assist in extension of their respective digits; each is innervated by the deep fibular (peroneal) nerve

B. Plantar surface of the foot
   1. Skin - thick
   2. Superficial fascia – thick, tough, and firmly connects skin to underlying deep (plantar) fascia
      a. Cutaneous nerves
   3. Deep (plantar) fascia – 3 parts:
   4. Blood supply
      a. Medial and lateral plantar arteries
   5. Muscles of the plantar surface of the foot
   6. Nerves of the plantar surface of the foot
      a. Medial and lateral plantar nerves

VI. Joints of the Lower Limb
   A. Hip joint
      1. Articular components
         a. Bones
         b. Joint capsule
         c. Capsular ligaments
      2. Blood Supply
         a. Medial femoral circumflex artery
         b. Lateral femoral circumflex artery
         c. Artery of ligament of head of femur – a small branch of obturator artery

   B. Knee joint
      1. Articular components
         a. Bones
         b. Joint capsule
         c. Ligaments
            i. Extracapsular ligaments
            ii. Intracapsular ligaments
         d. Menisci
         e. Bursae

   C. Tibiofibular joint (distal)

   D. Ankle (Talocrural) joint
      1. Articular components
         a. Bones
            i. Distal tibia
            ii. Distal fibula
            iii. Talus
         2. Joint capsule
         3. Ligaments

   E. Tarsal joints
F. Tarsometatarsal and intermetatarsal joints
G. Metatarsophalangeal and interphalangeal joints

VII. Arches of the foot
   A. Arches
      1. Medial longitudinal arch
      2. Lateral longitudinal arch
      3. Transverse arch
Neck
I. Surface Anatomy
   A. Palpable mid-line structures
   B. Palpable lateral structures

II. Skin and Fasciae of the Neck
   A. Skin
   B. Superficial cervical fascia
      1. Contents
         a. Platysma muscle
         b. Superficial veins
         c. Cutaneous nerves – derived from cervical plexus (ventral rami of C1 - C4).
   C. Deep cervical fascia and layers
   D. Retrovisceral (Retropharyngeal) space

III. Triangles of the Neck
   A. Anterior cervical triangle
      1. Subdivided into 3 paired triangles and 1 unpaired triangle:
   B. Posterior cervical triangle
      1. Subdivided into two unequal triangles

IV. Muscles of the Neck – attachments, actions, innervation
   A. Sternocleidomastoid
   B. Infrahyoid muscles
   C. Suprahyoid muscles
   D. Deep neck muscles

V. Nerves of the Neck
   A. Vagus nerve (CN X)
   B. Accessory nerve (CN XI)
   C. Hypoglossal nerve (CN XII)
   D. Ansa cervicalis (C1-C3)
   E. Phrenic nerve (C3,4,5)
   F. Roots and trunks of the brachial plexus (C5-C8, T1)
   G. Cervical portion of the sympathetic trunk
      1. Superior cervical ganglion
      2. Middle cervical ganglion
      3. Inferior cervical ganglion

VI. Vessels of the Neck
   A. Common carotid arteries
      1. Right common carotid artery
      2. Left common carotid artery
   B. Internal carotid artery (ICA)
   C. External carotid artery (ECA) and branches
   D. Subclavian arteries
      1. Right and left subclavian arteries and branches
E. Internal jugular vein
F. Subclavian vein

VII. Lymphatics of the Head Neck
   A. Lymph nodes of the head
   B. Lymph nodes of the neck
      1. Superficial cervical nodes
      2. Deep cervical nodes
   C. Thoracic duct
   D. Right lymphatic duct

VIII. Thyroid and Parathyroid Glands
   A. Thyroid gland – function, blood supply
   B. Parathyroid glands – function, blood supply

IX. Trachea and Esophagus
   A. Trachea
   B. Esophagus
Head

I. Osteology of the Skull
   A. Two functional parts:
      1. Neurocranium
      2. Viscerocranium
   B. Newborn skull
      1. Bones develop from two different types of bone formation
         a. Intramembranous ossification
         b. Endochondral ossification
   C. Bones and foramina

II. Face
   A. Skin
   B. Superficial fascia
      1. Cutaneous nerves – principally provided by branches of CN V via the ophthalmic
         \((V_1)\), maxillary \((V_2)\), and mandibular \((V_3)\) divisions
      2. Muscles of facial expression
      3. Facial nerve (CN VII) and branches
      4. Arteries – arterial supply to face and scalp is via two sources: ECA (principally)
         and ICA
         a. External carotid artery branches
         b. Internal carotid artery branch – Ophthalmic artery and its branches to face
      5. Veins – veins of the face lack valves, providing the potential for retrograde
         transmission of infectious agents to intracranial dural venous sinuses

III. Scalp
   A. Layers (5) of scalp (from superficial to deep) spell “SCALP”
      1. Skin
      2. Cutaneous layer (=superficial fascia)
      3. Aponeurotic layer
      4. Loose connective tissue layer
      5. Pericranium – the periosteum covering the skull
   B. Cutaneous nerve supply of scalp
   C. Blood supply

IV. The Parotid Gland
   A. General morphology and relationships
   B. Parotid duct (Stensen’s duct)
   C. Vessels traversing gland
      1. External carotid artery
      2. Retromandibular vein
   D. Parasympathetic nerve supply of parotid gland

V. Temporal and Infratemporal Fossae
   A. Temporal fossa
      1. Boundaries
      2. Contents
B. Infratemporal fossa
   1. Principal boundaries of fossa
   2. Principal contents of fossa
   3. Muscles of mastication (4 pairs)
   4. Temporomandibular joint (TMJ)
   5. Nerves in infratemporal fossa
      a. Mandibular nerve (V₃) and branches
      b. Otic ganglion
   6. Maxillary artery and branches
   7. Pterygoid venous plexus and maxillary vein

VI. Cranial Meninges, Dural Folds, and Dural Venous Sinuses
   A. Cranial meninges – 3 layers:
      1. Dura mater – consists of two parts: Periosteal and meningeal dura
      2. Arachnoid mater
      3. Pia mater
   B. Meningeal spaces – potential and real
      1. Epidural space – Clinical Note: Epidural hemorrhage
      2. Subdural space – Clinical Note: Subdural hemorrhage
      3. Subarachnoid space – Clinical Note: Subarachnoid hemorrhage
   C. Dural folds
   D. Dural venous sinuses
   E. Blood supply to brain and Circle of Willis

VII. The Orbit
   A. Bony orbit – a four-sided pyramid structure
   B. Extraocular muscles – 7 muscles; skeletal muscle in type
      1. Recti muscles
      2. Oblique muscles
      3. Levator palpebrae superioris
   C. Movements of eyeball and cardinal directions of gaze
   D. Nerves of orbit
      1. Motor nerves to extraocular muscles – LR₆, SO₄, all the rest by CN III
      2. Sensory nerves
         a. Ophthalmic nerve (CN V₁) and branches
         b. Optic nerve
      3. Autonomic nerve supply of orbit
   E. Vessels of orbit
      1. Ophthalmic artery and its branches
      2. Ophthalmic veins and its tributaries
   F. Structure of eyeball – three layers:
      1. Outer fibrous layer
      2. Middle layer – vascular and pigmented
      3. Inner layer – retina
   G. Refractive media of eyeball
      1. Cornea
      2. Aqueous humor
3. Lens
4. Vitreous body

H. Eyelid and lacrimal apparatus
   1. Eyelids – layers
   2. Lacrimal apparatus

VIII. The Pterygopalatine Fossa, Nose, Nasal Cavity, and Paranasal Sinuses
   A. Pterygopalatine fossa
      1. Boundaries
      2. Openings
      3. Contents
         a. Maxillary nerve and branches:
         b. Pterygopalatine ganglion
         c. Nerve of pterygoid canal
         d. Terminal portion of maxillary artery
   B. Nose
      1. Principal cartilages of nose
   C. Nasal cavity – divided into two chambers by a midline nasal septum
      1. Walls
      2. Functional zones
         a. Vestibule
         b. Olfactory zone
         c. Respiratory zone
      4. Nerve supply – pattern of general sensory supply follows closely that of arteries
         a. Olfactory nerve (CN I)
         b. Maxillary nerve (CN V₂)
         c. Anterior ethmoidal nerve – branch of nasociliary nerve (CN V₁)
   D. Paranasal sinuses
      1. Four pairs of paranasal sinuses – they are asymmetric in size
         a. Maxillary sinus
         b. Frontal sinus
         c. Ethmoidal sinuses (air cells)
         d. Sphenoid sinus

IX. The Pharynx
   A. Layers of pharyngeal wall
   B. Parts of the pharynx and associated structures
      1. Nasopharynx
      2. Oropharynx
      3. Laryngopharynx (hypopharynx)
   C. Waldeyer’s tonsillar ring
   D. Pharyngeal musculature
      1. Pharyngeal constrictors
      2. Longitudinal muscles of pharyngeal wall
      3. Actions of pharyngeal musculature and their innervation
   E. Nerve supply to pharynx
X. Soft Palate
   A. Muscles of soft palate
   B. Nerve and blood supply

XI. Oral Cavity
   A. Boundaries
   B. Parts
      1. Vestibule
      2. Oral cavity proper
   C. General contents
      1. Tongue
      2. Deep portion of submandibular gland and its duct
      3. Sublingual gland and its ducts
      4. Nerve and blood supply
   D. Palate – consists of hard palate and soft palate
      1. Nerve and blood supply
   E. Floor of oral cavity – formed by a pair of muscles
      1. Mylohyoid
      2. Geniohyoid
   F. Submandibular and sublingual salivary glands
   G. Tongue
      1. A mobile muscular structure, with a portion of it in the oral cavity and a portion of it in the oropharynx
      2. Plays a vital role in speech, preparation of food for swallowing, and for moving the bolus into the oropharynx
      3. Parts – develop differently, have different mucosae, and different nerve supplies
         a. Body – anterior two-thirds; horizontal, oral part
         b. Root – posterior third; vertical, pharyngeal part
         c. Sulcus terminalis and foramen cecum
   H. Muscles of tongue
      1. Intrinsic muscles
      2. Extrinsic muscles
   I. Nerve supply of tongue
      1. Lingual nerve
      2. Hyoglossal nerve
      3. Glossopharyngeal nerve
      4. Internal laryngeal nerve
   J. Blood supply of tongue and floor of mouth
      1. Lingual artery
      2. Lingual vein
   K. Lymphatic drainage of tongue

XII. Larynx
   A. Location and functions
   B. Surface anatomy
   C. Laryngeal cartilages
      1. Thyroid cartilage
2. Cricoid cartilage
3. Arytenoid cartilages
4. Epiglottis
5. Membranes

D. Interior of larynx
1. Aryepiglottic folds
2. Laryngeal inlet or aditus
3. Piriform fossae or recesses
4. Regions

E. Intrinsic muscles of larynx

F. Nerves and vessels
1. Superior laryngeal nerve
2. Recurrent laryngeal nerves
3. Superior laryngeal artery
4. Inferior laryngeal artery
5. Veins accompany their respective arteries
6. Lymphatic drainage follows the vasculature to the deep cervical lymph nodes

XIII. Ear
A. External ear – consists of two parts:
1. Auricle
2. External auditory (acoustic) meatus

B. Tympanic membrane
1. A thin, oval, translucent membrane about 1 cm in diameter; pearly gray in health
2. Cone-shaped (concave, not flat)
3. Separates external auditory meatus from the middle ear cavity
4. Composed of three layers: outer, middle, inner; pars tensa, pars flaccida
5. “Cone of light”
6. Nerve supply

C. Middle ear cavity (tympanic cavity)
1. Roof – tegmen tympani
2. Floor – jugular fossa, a layer of bone separating the tympanic cavity from the jugular foramen and the IJV
3. Lateral wall – tympanic membrane
4. Medial wall – promontory
   a. Tympanic nerve plexus
   b. Oval window (fenestra vestibuli)
   c. Round window (fenestra cochleae)
5. Posterior wall
   a. Entrance, on its superior aspect, to the mastoid antrum and mastoid air cells
   b. Pyramidal eminence
6. Anterior wall
   a. Semicanal for the tensor tympani muscle
   b. Pharyngotympanic tube (auditory tube, Eustachian tube)
7. Auditory ossicles (lateral to medial sequence; articulate via synovial joints)
   a. Malleus (hammer)
   b. Incus (anvil)
c. Stapes (stirrup)

8. Muscles
   a. Stapedius
   b. Tensor tympani

9. Nerves
   a. Facial nerve – course and branches

E. Inner ear (covered in detail in Neuroanatomy)
   1. Cochlea
   2. Semicircular canals