Syllabus / Curriculum of Anatomy subject in 1st MBBS at the AIIMS Raipur

Objectives:

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

*Understand the disposition, interrelationship, gross, microscopic, developmental, functional and applied anatomy of all the structures and system of human body.

*Correlate all the structures and system of the body in their altered state in various diseases and common anomalies by understanding their nature and cause including genetic inheritance.

As total duration of the Anatomy subject course is 1 year, it should extend from the 1st July of the year to the 15th June of the following year.

Anatomy should be taught and studied under the following divisions:	Approximate hours
1. Gross or Macroscopic anatomy (Lectures 134 hrs+ Demonstration 36+ Practical198)	368
2. Microanatomy	48
3. Embryology or Developmental anatomy and Genetics	64
4. Examination (Test, Tutorial, PCT, Terminal Exams)	70
Total number of hours to be utilized for Anatomy course should be:	550

Towards excellent teaching and studying anatomy, the Gross anatomy should be divided in to 7 sub-divisions i.e. General anatomy, upper limb, head & neck, brain & spinal cord, thorax, abdomen and lower limb. The Histology and Embryology teaching and studying should be running parallely with gross anatomy. The Genetics teaching and studying should be in continuity with the completion of embryology. The syllabus and distribution of teaching hours for the theory, the demonstration/osteology and the practical part should be as follows:

Macroscopic anatomy / Gross Anatomy: **Approximate hours**

(1) General anatomy: Approximate hours

Lectures: 10

i. Introduction and history of Anatomy
ii. Nomenclature/Terminology
iii. Skin, fasciae and modifications
iv. Skeleton
v. Joint
vi. Muscle
vii. CVS & Lymphatic system
viii. Nervous system
ix. Respiratory & digestive system
x. Urogenital system

Practical: 10

(2) Upper limb: Approximate hours

Lectures: 15

i. Introduction, Pectoral region and breast
ii. Pectoral muscles, clavipectoral fascia, Axilla

iii. Brachial plexus
iv. Cutaneous nerves of back, Trapezius, Latissimus dorsi
v. Veins and Lymphatic drainage of upper limb
vi. Cutaneous nerves and dermatomes of upper limb
vii. Scapular region and intermuscular spaces
viii. Shoulder joint
ix. Front of arm (muscles, vessels, nerves), cubital fossa
x. Back of arm and radial nerve
xi. Front of forearm (muscles, vessels, nerves)
xii. Palm I (superficial muscles, vessels, nerves)
xiii. Palm II (deep muscles, vessels, nerves)
xiv. Back of forearm and hand
xv. Joints of UL (elbow joint to interphalangeal joints)

Demonstration/Osteology: 8

i. Clavicle
ii. Scapula
iii. Humerus
iv. Radius
v. Ulna
vi. Articulated hand
vii. Surface anatomy UL
viii. Radiology UL

Practical: 23

(3) Head & Neck: Approximate hours

Lectures: 31

i. Scalp and temple
ii. Face, Lacrimal apparatus
iii. Superficial & deep cervical fascia
iv. Posterior triangle of neck, sternocleidomastoid muscle
v. Back of neck, muscles, suboccipital triangle
vi. Anterior triangle of neck, median region, Submental & digastric triangle
vii. Carotid & muscular triangles
viii. Cranial cavity, meninges, dural folds, cavernous sinus
ix. Pituitary gland, trigeminal ganglion and meningeal vessels
x. Thyroid & parathyroid glands
xi. Trachea, esophagus, brachiocephalic & subclavian vessels
xii. Carotid arteries, jugular veins
xiii. Nerves of the neck, glossopharyngeal, vagus, accessory and hypoglossal
xiv. Sympathetic trunk, cervical plexus, scalene muscles
xv. Prevertebral muscles, vertebral vessels, lymph vessels & nodes of H & N
xvi. Submandibular region, suprahyoid muscles
xvii. Orbit I, Structures in orbit, muscles
xviii. Orbit II, vessels & nerves
xix. Parotid gland
xx. Temporal fascia, muscles of mastication, maxillary vessels
xxi. TM joint, mandibular nerve, otic ganglion
xxii. Pharynx I, (mouth, pharyngeal wall, constrictor muscles)
xxiii. Pharynx II, (Interior of pharynx, tonsils, soft palate, auditory tube)
xxiv. Nose I (Cavity, septum & lateral wall)

xxv. Nose II (Pterygopalatine fossa & ganglion, paranasal sinuses)
xxvi. Larynx I (structure, cartilages, interior)
xxvii. Larynx II (muscles, vessels & nerves)
xxviii. Tongue
xxix. Ear (External, middle & Internal)
xxx. Eyeball
xxxi. Joints of H & N

Demonstration/Osteology: 9

i. Skull anatomical position, norma verticalis and occipitalis
ii. norma frontalis
iii. norma lateralis
iv. norma basalis
v. interior of skull and cranial fossae
vi. Mandible
vii. Cervical vertebrae
viii. Surface anatomy Head & Neck
ix. Radiology Head & Neck

Practical: 47

(4) Brain and spinal cord: Approximate hours

Lectures: 19

i. Introduction & parts of nervous system
ii. Spinal cord, meninges, arteries & veins, contents of vertebral canal
iii. Meninges and CSF
iv. Base of the brain, interpeduncular fossa, superficial attachments of cranial nerves
v. Vessels of brain
vi. Medulla oblongata
vii. Pons
viii. Cerebellum, cerebellar peduncles
ix. 4th ventricle
x. Midbrain
xi. Cerebrum I
xii. Cerebrum II
xiii. White matter of cerebrum, Internal capsule
xiv. Third ventricle, lateral ventricle
xv. Diencephalon
xvi. Basal nuclei
xvii. Limbic system, reticular formation
xviii. Neural pathways I
xix. Neural pathways II

Practical: 29

(5) Thorax: Approximate hours

Lectures: 13

i. Introduction of thorax, inlet, outlet, landmarks, thoracic wall
ii. Intercostal muscles, nerves and vessels
iii. Internal thoracic artery, azygos vein, thoracic sympathetic trunk
iv. Mediastinum
v. Pleura
vi. Lungs, bronchopulmonary segments

vii. Pericardium, external features of heart,
viii. Coronary arteries, veins & nerves of heart, cardiac plexuses
ix. Right atrium and ventricle
x. Left atrium and ventricle
xi. Ascending aorta, arch of aorta, descending aorta, conducting system of heart, pulmonary trunk
xii. Thoracic part of trachea, esophagus, and Thoracic duct. Right lymphatic duct
xiii. Joints of thorax and respiratory movements

Demonstration/Osteology: 5

i. Sternum
ii. Ribs
iii. Vertebral column and thoracic vertebrae
iv. Surface anatomy thorax
v. Radiology thorax

Practical: 20

(6) Abdomen: Approximate hours

Lectures: 28

i. Anterior abdominal wall, cutaneous nerves, vessels, lymphatics
ii. Muscles of anterior abdominal wall, rectus sheath
iii. Inguinal canal, spermatic cord, hernia
iv. Male external genitalia, scrotum, testis, epididymis, penis
v. Nine regions of abdomen, Peritoneum I (lesser & greater sac)
vi. Peritoneum II (Vertical & transverse disposition, mesenteries, fossae)
vii. Spleen, coeliac trunk, stomach
viii. Differences between small & large intestine, duodenum, jejunum, Ileum
ix. Large intestine, Caecum, appendix, ascending, transverse, descending, sigmoid colon
x. Mesenteric vessels, portal vein, portocaval anastomoses
xi. Pancreas
xii. Liver
xiii. Extra hepatic biliary apparatus, autonomic nervous system, coeliac plexus
xiv. Suprarenal gland and chromaffin system
xv. Kidney and ureter
xvi. Diaphragm
xvii. Abdominal aorta, IVC, Lymph nodes of Posterior abdominal wall, cistern chili
xviii. Muscles, fascia, nerves of posterior abdominal wall, lumbar plexus, lumbar arteries & veins
xix. Lesser pelvis, position of pelvic viscera & pelvic peritoneum
xx. Perineum, female external genital organ, anal region & ischiorectal fossa
xxi. Urogenital region, superficial & deep perineal spaces, lymph vessels of perineum
xxii. Ovaries, uterine tubes, uterus & vagina
xxiii. Urinary bladder, Male and female urethra
xxiv. Prostate, ductus deferens, seminal vesicle & ejaculatory duct
xxv. Rectum and anal canal
xxvi. Vessels, lymph nodes & nerves of pelvis
xxvii. Pelvic fascia and muscles
xxviii. Joints of pelvis

Demonstration/Osteology: 5

i. Lumbar vertebrae
ii. Sacrum
iii. Pelvis, pelvimetry
iv. Surface anatomy abdomen
v. Radiology of Abdomen

Practical: 42

(7) Lower limb: Approximate hours

Lectures: 18

i. Introduction, front of thigh, fasciae, great saphenous vein, cutaneous nerves
ii. Femoral triangle, sheath, canal & hernia, femoral vessels & nerve
iii. Adductor canal, iliotibial tract, intermuscular septa, muscles of front of thigh
iv. Adductor compartment of thigh, muscles, vessels and nerves
v. Gluteal region I: fasciae, cutaneous nerves, gluteus maximus & structures deep to it, sciatic foramina
vi. Gluteal region II: nerves, vessels, gluteus medius & minimus, small muscles on the back of hip joint
vii. Popliteal fossa
viii. Back of thigh, muscles, nerves, vessels
ix. Hip joint
x. Front of leg & dorsum of foot, muscles, vessels & nerves
xi. Lateral & medial sides of leg, muscles, vessels & nerves
xii. Back of leg, muscles, vessels & nerves
xiii. Venous & lymphatic drainage of lower limb
xiv. Sole of foot I: fasciae, 1^{st} to 3^{rd} layers
xv. Sole of foot II: 4^{th} to 6^{th} layers
xvi. Knee joint
xvii. Tibiofibular joints, ankle joint & joints of foot
xviii. Arches of foot

Demonstration/Osteology: 9

i. Hip bone I
ii. Hip bone II
iii. Femur I
iv. Femur II
v. Tibia
vi. Fibula
vii. Articulated foot
viii. Surface anatomy lower limb
ix. Radiology of lower limb

Practical: 27

Microscopic anatomy / Histology: Approximate hours

Lectures: 24

i. Introduction histology, microscope and cell
ii. Epithelium
iii. Glandular tissue
iv. Connective tissue
v. Cartilage
vi. Bone
vii. Muscular tissue
viii. Integumentary system
ix. Lymphatic system I
x. Lymphatic system II
xi. Cardiovascular system
xii. Respiratory system
xiii. Digestive system I (Salivary glands)
xiv. Digestive system II (Tongue and Esophagus)
xv. Digestive system III (Stomach and duodenum)

xvi. Digestive system IV (Jejunum, Ileum, large intestine and appendix)
xvii. Digestive system V (Liver, gall bladder and pancreas)
xviii. Urinary system
xix. Male reproductive system
xx. Female reproductive system
xxi. Endocrine glands
xxii. Nervous system I (Neuron, nerve and ganglion)
xxiii. Nervous system II (Cerebral & cerebellar cortex and spinal cord)
xxiv. Special senses

Practical: 24

Developmental anatomy / Embryology and Genetics: Approximate hours

Lectures: 32

i. Introduction embryology, gametogenesis
ii. Ovarian follicles, ovulation, corpus luteum
iii. Menstrual cycle, correlation with contraceptive methods
iv. Fertilisation and early development of zygote, primary & secondary mesoderm
v. Notochord, neurulation, foldings of embryo
vi. Deciduas, implantation, placenta, abnormal placenta
vii. Umbilical cord, amniotic fluid, twins and multiple pregnancies
viii. Skin and appendages, mammary gland, anomalies
ix. Limbs, anomalies
x. Musculoskeletal system I
xi. Musculoskeletal system II, anomalies
xii. Pharyngeal apparatus, clefts, anomalies
xiii. Pharyngeal pouches, thyroid, anomalies
xiv. Face, palate, anomalies
xv. Nervous system I (Spinal cord, brain), anomalies
xvi. Nervous system II (Brain, Pituitary gland), anomalies
xvii. Respiratory System, anomalies
xviii. Body cavity, diaphragm, anomalies
xix. Cardiovascular system I (Heart, ventricles, atria), anomalies
xx. Cardiovascular system II (Arteries), anomalies
xxi. Cardiovascular system III (Veins), anomalies
xxii. Digestive system I (Oral cavity, teeth, salivary glands), anomalies
xxiii. Digestive system II (Tongue, pharynx, esophagus, stomach, spleen), anomalies
xxiv. Digestive system III (Duodenum, Liver, pancreas), anomalies
xxv. Digestive system IV (Midgut, hind gut), anomalies
xxvi. Urinary system, anomalies
xxvii. Male and female gonads, anomalies
xxviii. Male and female genital duct system, anomalies
xxix. Male and female external genitalia, anomalies, suprarenal gland
xxx. Genetics I
xxxi. Genetics II
xxxii. Genetics III

Practical: 32

*** Osteology** should include the bones of skeletal system, their names, parts, anatomical positions, articulations, muscular and ligamentous attachments, blood supply, ossification and clinical anatomy. Individual bones of skull, hand and foot should not be taught and studied separately; they should be taught and studied as skull as a whole, articulated hand and articulated foot.

* **Histology** should include its introduction and basic principles of microscopy; common stains; and normal structure of tissues and organs of the body.

* **Embryology** should include its introduction, gametogenesis, fertilisation; and stages in development of various structures, organs and systems of the body.
* **Radiology** should include the study of X-rays, CT and MRI of various regions of the body.
* **Surface Anatomy** should include surface marking of main vessels, nerves and organs of the body and knowledge of surface landmarks in living subject.
* **Dissection** should be done by students on the cadaver by the assistance of teachers allotted for the tables.
* **Cross sections** of various parts of the body should be correlated with CT & MRI.
* **Practical Manuals** should be used by the students to draw selected figures of macroscopic, microscopic and developmental anatomy including genetics.
* Weekly or fortnightly tests / tutorials / seminar by students / other activities like model or drawing competitions should be scheduled at regular intervals.

Minimum eligibility criterion to appear in 1st Professional Examination:

35% marks in Internal Assessment separately in theory and practical

Attendance: 75% in Theory Classes

80% in Practical Classes

Examination pattern and Marks distribution:

Marks:			Theory	Practical
Internal Assessment Marks:	200		100	100
Professional Examination Marks:	200		100	
		Viva	20	80
Total:	400		220	180

(So finally, to pass the 1st Professional MBBS Exam, student has to get minimum 50% marks in theory i.e. 110 out of 220 and minimum 50% marks in practical i.e. 90 out of 180)

(*Internal Assessment Marks would be calculated from the marks obtained in 1st Terminal, 2nd Terminal and Pre-Professional Examinations (as average of 3) as follows:

	Theory	Practical
1st Terminal Exam: (On the syllabus completed)	50	50
2nd Terminal Exam: (On the syllabus completed after 1st Terminal Exam)	50	50
Pre Professional: (On the whole syllabus) By 2 Theory papers-		
*Paper I: Upper limb, Head neck, Neuroanatomy and their related general & gross anatomy, microanatomy, developmental anatomy & genetics.	50	
*Paper II: Thorax, Abdomen, Lower limb and their related general & gross anatomy, microanatomy, developmental anatomy & genetics.	50	
Viva voce:	20	80
Total	220	180 Total=400
Internal Assessment marks:	100	100 Total=200)

(*Professional Examination Marks would be as follows:

	Theory	Practical
By 2 Theory papers-		
*Paper I: Upper limb, Head neck, Neuroanatomy and their related general & gross anatomy, microanatomy, developmental anatomy & genetics.	50	
*Paper II: Thorax, Abdomen, Lower limb and their related general & gross anatomy, microanatomy, developmental anatomy & genetics.	50	
Viva voce:	20	80
Total Professional Examination Marks	120	80 Total=200)

(Pre-Professional and Professional Examinations cover theory and practical tests:
Theory includes two papers of 50 marks each in the form of mcqs & short questions on general anatomy, gross anatomy (including gross structure, orientation, diagram, relations, blood supply, lymph supply, nerve supply, diagrams, relations, sectional/surface/radiological/imaging and applied anatomy), histology, embryology and genetics.

Practical includes examination of student's knowledge about human general & gross anatomy, histology, embryology and genetics by using spots, hard & soft dissected parts, sectional parts, viscera, specimens, slides, models, charts, x-rays & imaging films and techniques; surface marking, manuals and viva voce.)

Books recommended:

1. Cunningham's Manual of Practical Anatomy: G.L.Romanes, Volume I, II, III (Latest Edition)
2. Human Anatomy: B D Chaurasia OR Vishram Singh Volume I, II, III, General Anatomy (Latest Edition)
3. Human Histology: Inderbir Singh (Latest Edition)
4. Human Embryology: Inderbir Singh (Latest Edition)
5. Manuals (Gross & Microanatomy) by the Department of Anatomy AIIMS Raipur

Optional reference books:

1. GRAY'S Anatomy: Susan Standring, Churchill Livingstone (Latest Edition)
2. Clinical Anatomy for Medical students: RS Snell (Latest Edition)
3. Di Fiore's Atlas of Histology with functional correlation: Eroschenko VP (Latest Edition)
4. Langman's Medical Embryology: T.W Sadler (Latest Edition)
5. Netter's Atlas of Anatomy (Latest Edition)
6. Grant's Atlas of Anatomy (Latest Edition)
7. Thomson and Thomson Genetics in Medicine: Robert L.Nussbaum, Roderick R.Mc.Innes, Huntington, E.Willard (Latest Edition)
8. Surface and Radiological Anatomy: A.Halim