STUDY GUIDE SECOND YEAR MBBS ANATOMY

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ANATOMY DEPARTMENT AT A GLANCE

The department of Anatomy is the largest pre-clinical department and occupies a separate block adjacent to college entrance. The anatomy department has a fully equipped, well ventilated, air conditioned and spacious Dissection Hall with mortuary plants for storage of cadavers. The histology laboratory is unmatched and equipped with latest tools for microscope tissue preparation and high quality binocular microscope for self study including Bihead microscope for teaching purposes which can also be attached to monitor or LED TV through state of the art camera mounted on the microscope. The Histology laboratory has a vast collection of microscopic slides of human and animal tissues for study purposes. Students have free access to them. The department also has state-of-the-art Anatomy museum with over 100 important models of the human body. Models range from the various human development stages to life-size human torsos, disc torsos, skeletons, enhanced models of organs of special senses and functional models of various organs and systems of the body. There is also a bone bank for the students from where bones can be borrowed for study at home. There is one lecture hall and two tutorial rooms in the department. Offices of the faculty are provided with computers, air conditioner, modern furniture and display boards for the important notices .There is one main notice board of the department where important notices are displayed for information of students. Different charts from gross anatomy, histology and embryology are displayed on the walls of the histology laboratory, dissection hall, museum and area in front of the offices.

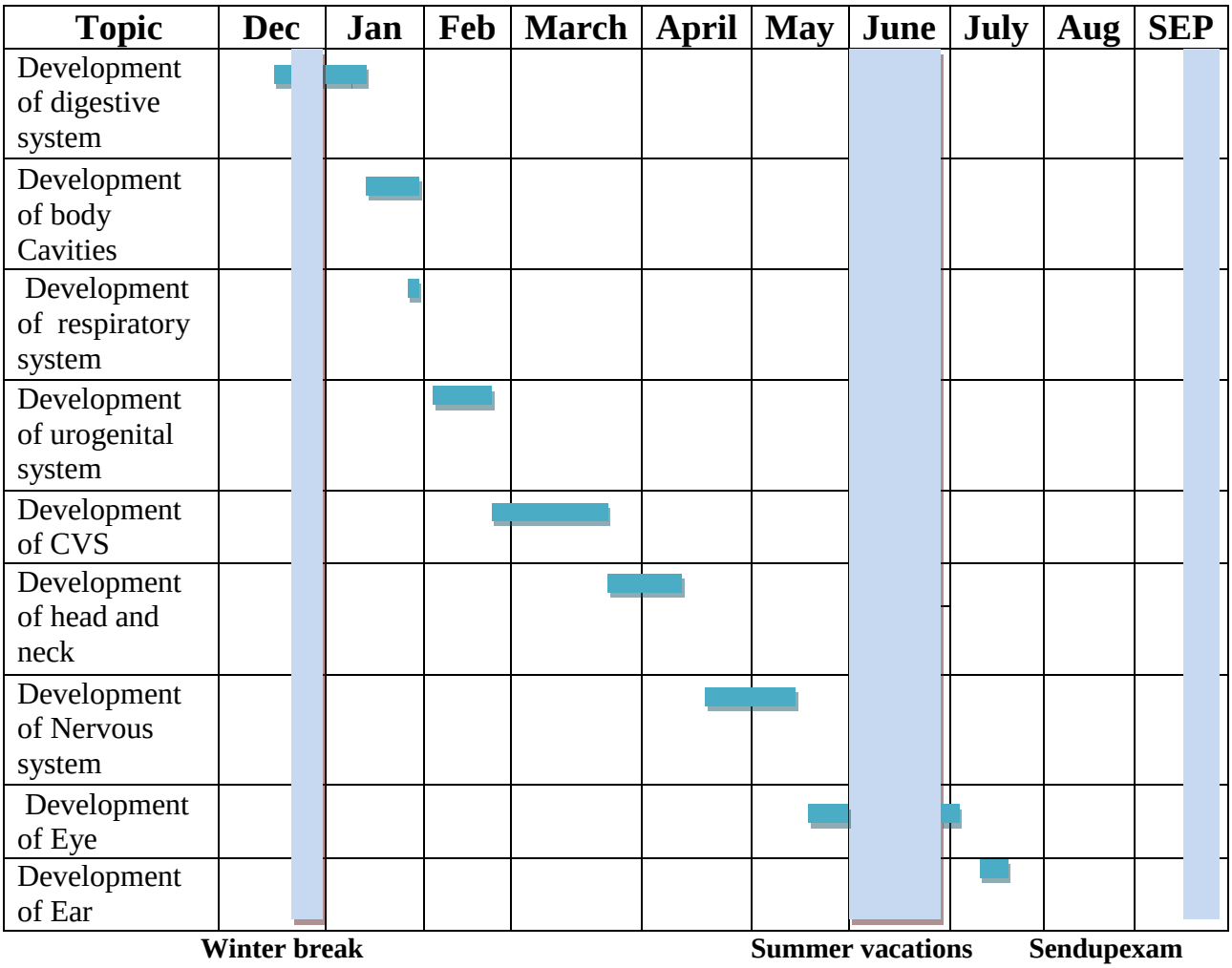
The department of anatomy conducts lectures, dissection, practicals, tutorials and small group discussions to teach gross anatomy, histology and embryology. Moreover, sub-stages and stages are arranged for the assessment of the students in Gross Anatomy. Term tests and monthly tests are arranged to assess the students in histology, general anatomy and embryology.

DEPARTMENTAL TEAM OF ANATOMY-AFMDC

Positions	Name
Head Of Department	Prof. Dr.Quddus-ur-Rehman
Professor Of Anatomy	Prof.Dr.Usman Latif
Assistant Professor	Dr. M. Adeel Alam Shah
Demonstrators	Dr.Faiqa Haris
	Dr. Ayesha Khalid
	Dr. Iqra Manzoor
	Dr. Ayesha Zahoor
	Dr. Fizza Khalid
	Dr.Aqsa Shafi
Lab Attendants	Mr.Adnan Akhter
	Mr. Muhammad Ahsan
Dissection Hall Attendant	Mr. Shahbaz Ahmad
Curator of Museum	Mr. Rafique khokhar
Computer Operator	Mr. Muhammad Farooq

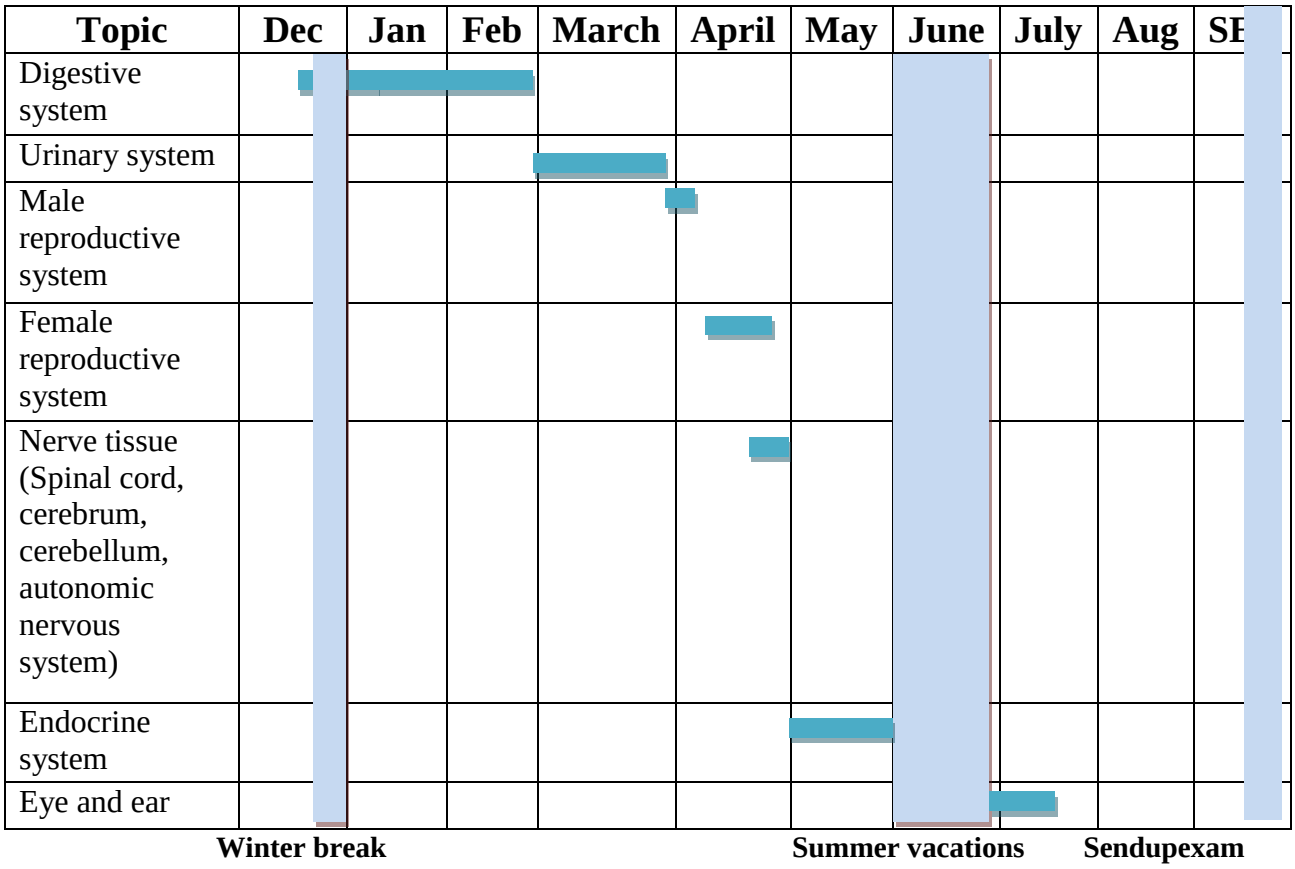
TIME LINE for SYLABUS COMPLETION

GHANTT CHART of SECOND YEAR LECTURES (Embryology)

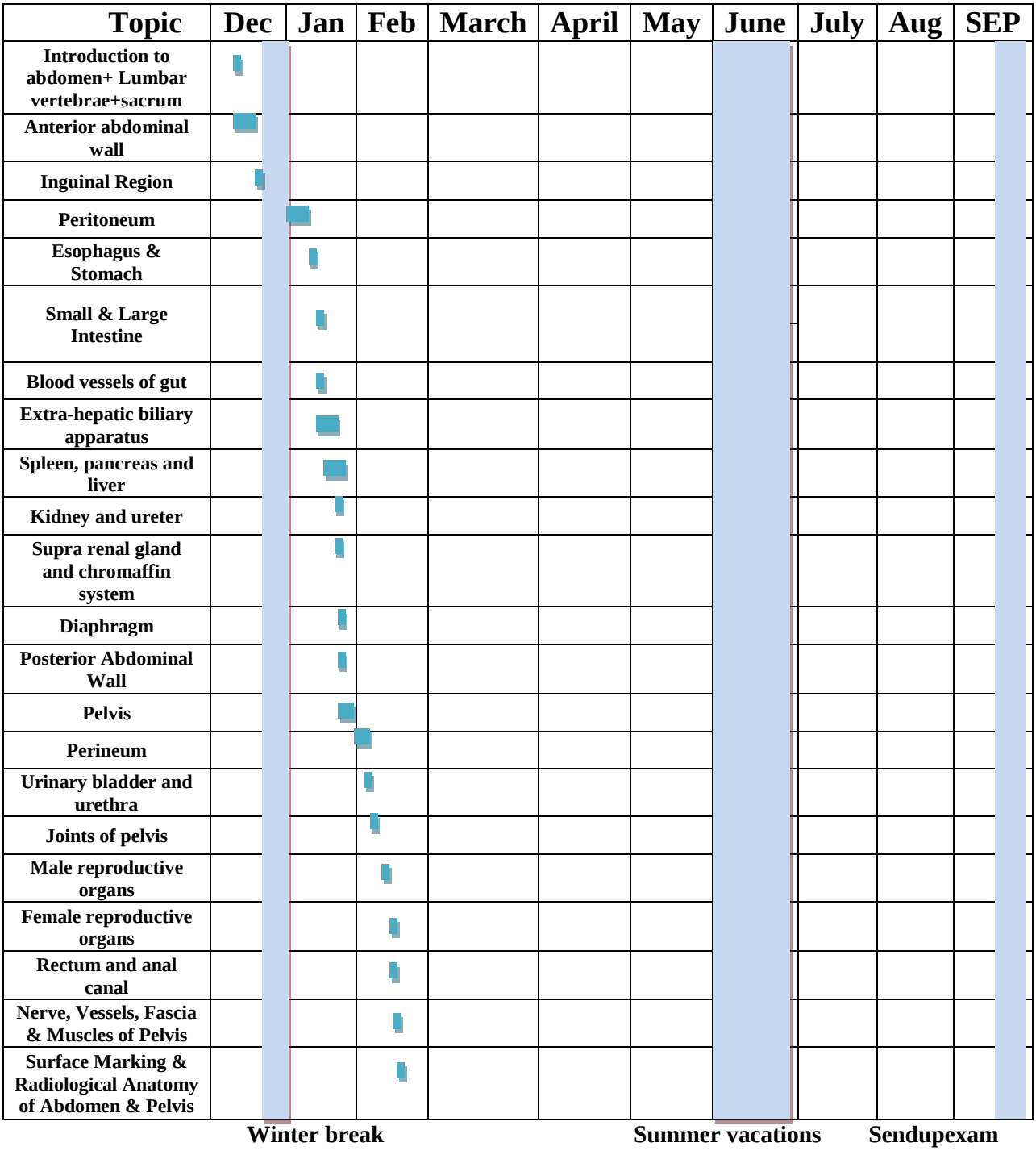


TIME LINE FOR SYLABUS COMPLETION

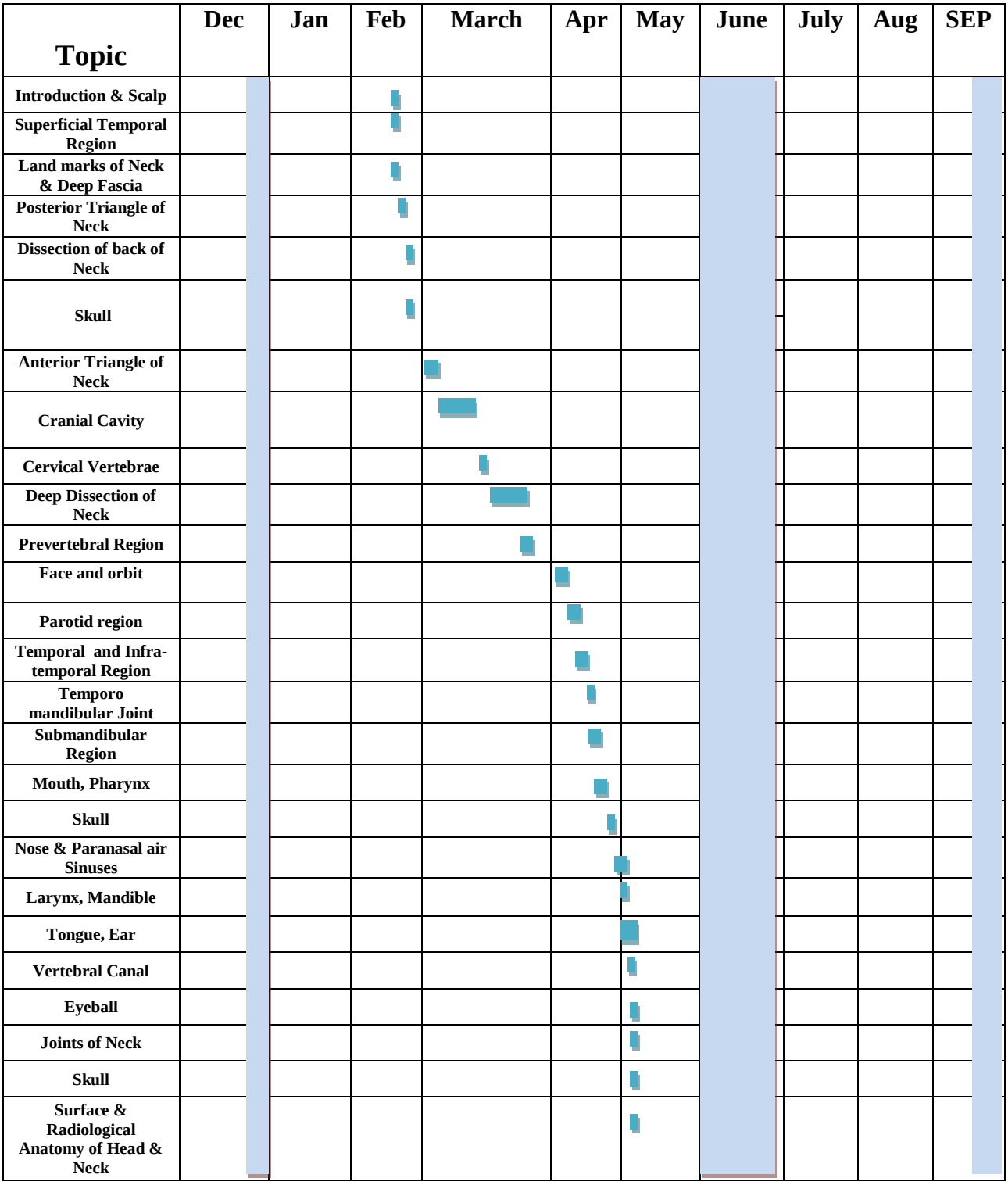
GHANTT CHART OF SECOND YEAR LECTURES (Histology)



GHANTT CHART of SECOND YEAR for abdomen and pelvis



GHANTT CHART of SECOND YEAR for HEAD AND NECK



Winter break **Summer vacations** **Sendupexam**

GHANTT CHART of FIRST YEAR for brain and spinal cord

Topic	Dec	Jan	Feb	March	April	May	June	July	Aug	SEP
Introduction										
Meninges of Brain										
Blood Supply of Brain										
Base of Brain										
Spinal Cord										
Medulla oblongata										
Pons										
Cerebellum										
Mid Brain										
Fourth Ventricle										
Cerebrum										
Lateral ventricles										
Deep Dissection of Cerebrum										
Choroid fissure, optic tract										
Basal Nuclei										
Hypothalamus										
Thalamus										
Subthalamus, epithalamus, metathalamus+ clinical aspects										
Reticular formation										
Ventricular System										
Cranial Nerve										
Autonomic Nervous System										

Winter break **Summer vacations** **Sendupexam**

Timetable

Day	08:00 08:45	08:45 09:30	09:30 10:15	10:15 11:15	11:15 13:00	13:30 15:00
Monday			Lec Anatomy		Practical Histology	Dissection
Tuesday	Lec Anatomy			Practical Histology	Tutorial	Dissection
Wednesday			Lec Anatomy		Tutorial	Dissection
Thursday	Lec Anatomy				Practical Histology	Dissection
Friday			09:30 10:15	10:15 11:30	11:30 01:00	
			Lec Anatomy	Dissection	Tutorial	

Course	Topic	Sub topic	Learning Objectives (At the end of the Lecture the students of 2nd Year MBBS will be able to
Special Embryology (2nd Year)	**Digestive System**	Division of the Gut Tube	• Discuss the development of foregut
		Development of Mesenteries	• Explain the development of mesenteries
		Development of foregut (Esophagus, Stomach, Duodenum)	• Explain the development of esophagus, stomach and duodenum.
		Development of Liver, Molecular Regulation of Liver Induction	• Explain & discuss the development of liver and gall bladder.
		Development of Gallbladder	
		Development of Pancreas, Molecular Regulation of Pancreas Development	• Explain & Discuss the development of pancreas
		Development of Midgut, Physiological Herniation, Rotation of the Midgut, Retraction of Herniation Loops, Mesenteries of the Intestinal Loops	• Explain the development of midgut, its rotation & formation & retraction of physiological Hernia of Midgut • Explain the development of diaphragm
		Development of Diaphragm	
		Development of Spleen	• Outline the development of spleen. • Explain the development of Hindgut
		Development of Hindgut	
		Abnormalities of the Mesenteries, Body Wall Defects, Vitelline duct Abnormalities	• Enlist & explain congenital anomalies related to foregut, midgut, hindgut, diaphragm, mesenteries & viscera • Observe, engage & participate in the discussion during SGD
		Gut Rotation Defects, Gut Artresias and Stenoses	
		Developmental defects of the diaphragm	
		Developmental defects of viscera	

	Body Cavity	Development of body Cavities	• Describe the development of body cavities • Explain congenital anomalies related to it. • Observe, engage & participate in the discussion during SGD
	Urogenital System	Development of Kidney System Metanephros: The Definitive Kidney Molecular Regulation of Kidney Development Function of the Kidney	• Explain & discuss the development of kidneys, ureters, urinary bladder & Urethra. • Enlist & explain congenital anomalies of kidneys, ureters, urinary bladder & urethra. • Explain the development of Fallopian tubes, uterus & Vagina • Describe the development of testes, epididymis, vas deferens, seminal vesicles & prostate • Discuss the development of external genitalia • Explain the development and descent of testes & ovaries • Discuss mal-descent of testes • Enlist & explain congenital anomalies of the genital system • Explain syndromes leading to ambigous sex states
		Development of Bladder and Urethra	
		Development of Gonads	
		Development of Genital Ducts	
		Development of Vagina & External Genitalia	
		Descent of the Testes	
		Descent of the Ovaries	
	Respiratory System	Formation of the Lung Buds	• Explain the development of upper & lower respiratory tract • Enlist & explain congenital anomalies of respiratory system • Observe, engage & participate in the discussion during SGD
		Larynx	
		Trachea, Bronchi and lungs	
		Maturation of the Lungs	
	Cardiovascular System	Establishment of the Cardiogenic Field / formation and position of the Heart Tube / formation of the Cardiac Loop	• Explain the development of Heart aortic arches, aorta, SVC, IVS & portal veins • Explain the development of venous system • Describe the fetal circulation & changes at birth • Enlist & explain the congenital anomalies of CVS • Observe, engage & participate in the discussion during SGD
		Development of sinus Venosus / formation of the Cardiac Septa / Formation of the Conducting System of the Heart	
		ARTERIAL SYSTEM Aortic Arches / vitelline and Umbilical Arteries	

		VENOUS SYSTEM Vitelline Veins	
		CIRCULATION BEFORE AND AFTER BIRTH Fetal Circulation Circulatory Changes at Birth Development of Lymphatic System	
		Common Congenital Anomalies Of The Heart & arterial & venous & system lymphatic	
	Head & Neck	Pharyngeal Arches	• Explain the development of pharyngeal arches, clefts, pouches & membranes. • Enlist derivatives of Pharyngeal arches, clefts, pouches & membranes • Explain & discuss the development of tongue, Thyroid gland, pituitary gland, face & palate • Enlist & explain congenital anomalies of the region • Explain the development of teeth. • Observe, engage & participate in the discussion during SGD
		Pharyngeal Pouches	
		Pharyngeal Clefts	
		Neutral Crest Cells and Craniofacial Defects	
		Development of tongue	
		Development of Thyroid Gland	
		Development of Parathyroid Gland	
		Development of Pituitary Gland	
		Development of Face	
		Development of Palate	
		Development of Upper Respiratory System	
		Development of Teeth	
		Tracheo – oesophageal Fistula	
		Cleft lip and palate	
	Nervous System	Spinal Cord / Neuroepithelial, Mantle and Marginal Layer / Positional Changes of the Cord	• Enlist different brain vesicles & their derivatives • Explain the development of spinal cord • Explain the development of hind-brain, Mid-brain & Fore-brain • Enlist the derivatives of Neural crest cells • Explain the development of ANS & Peripheral Nervous system • Enlist & explain the congenital anomalies of Nervous system • Observe, engage & participate in the discussion during SGD
		Rhombencephalon: Hindbrain	
		Prosenephalon: Forebrain	
		Development of Syumpathetic Nervous System	

		Development of Parasympathetic Nervous System	
	Ear & Eye	Development of Ear	• Describe the development of external middle & interval ear. • Enlist & explain the congenital anomalies of ear • Observe, engage & participate in the discussion during SGD
	Eye	Development of Eye	• Explain the development of eyeball & lacrinal Apparatus • Enlist & explain congenital anomalies of Eye. • Observe, engage & participate in the discussion during SGD
Special Histology (2nd Year)	**Digestive System**	General Structure of the Digestive Tract / The Oral Cavity	• Outline the general histological structure of Digestive tract • Describe epithelium having the oral cavity tongue, gums, hard & soft palates, pharynx, lips • Explain the histology of Tongue • Explain the Histological structure of esophagus, stomach, small intestine, large intestine appendix & anal canal • Explain the change in structure of their epithelia in relation to function • Elaborate the histological structure & functions of salivary glands • Describe the Histological structure & functions of liver, gall bladder, Biliary tract & pancreas. • Draw & label diagrams of above mentioned structures (under light microscope)
		Tongue / Gums / Hard Palate	
		Soft palate / Pharynx and lips / Esophagus	
		Stomach / Duodenum	
		Small Intestine / Large Intestine	
		Appendix / Salivary Glands	
		Pancreas / Liver	
		Biliary Tract / Gallbladder	
	Urinary System	Kidneys	• Explain the histological structure of kidney, ureter, urinary bladder, urethra & their functions.
		Bladder / Urinary Passages	
	Endocrine System	Hormones / Hypothesis	• Describe the histological structures & functions of pituitary, thyroid, parathyroid, adrenal Islets of Langerhans's & Pineal glands
		Adenohypophysis / Neurohypophysis	
		Adrenal (Superarenal) Glands	

		/ Islets of Langerhans	
		Thyroid	
		Parathyroid Glands / Pineal Glands	
	Male Reproductive System	Testes / Genital Ducts	• Explain & Illustrate the Histological structure of testes, epididymis, vas deferens, seminal vesicles, prostate • Relate their structure to their function.
		Excretory Genital Ducts / Accessory Genital Glands	
	Female Reproductive System	Ovaries / Oviducts	• Describe histological structure of ovaries, fallopian tubes, uterus, vagina & external Genitalia
		Uterus / Vagina	• Explain their functions related to their structures.
		External Genitalia	
	Eye & Ear	Vision: The Photoreceptor System	• Describe the histological structure of eye ball
			• Explain the microscopic anatomy of cornea & Retina
		Hearing: The Audio-receptor System	• Explain the membranes labyrinth
			• Explain the histological structure of different parts.
	Nerve Tissue The Nervous System	Spinal Cord & its function	• Correlate their functions to the structures
		Cerebellum & its function	
		Cerebrum & its function	• Describe the histological structure of spinal cord, cerebellum & cerebrum
		Autonomic Nervous System	
Special Histology Practical (2nd Year)	**Digestive System**	General Plan of GIT	• Outline the General Plan of GIT Histology
		Tongue / Taste Buds	• Identify Tongue & Taste buds under light Microscope Draw & label Histological Diagram of Tongue & Taste Buds.
		Salivary Glands	• Identify Salivary Glands under light Microscope Draw & label Histological Diagram of Salivary Glands.
		Oesophagus	• Identify Oesophagus under light Microscope • Draw & label Histological Diagram of Oesophagus.
		Stomach	• Identify Stomach under light Microscope • Draw & label Histological Diagram of Stomach.

		Duodenum	• Identify Duodenum under light Microscope • Draw & label Histological Diagram of Duodenum.
		Ileum (Small Intestine)	• Identify Ileum (Small Intestine) under light Microscope • Draw & label Histological Diagram of Ileum (Small Intestine).
		Colon (Large Intestine)	• Identify Colon (Large Intestine) under light Microscope • Draw & label Histological Diagram of Colon (Large Intestine).
		Rectum and Canal	• Identify Rectum and Canal under light Microscope • Draw & label Histological Diagram of Rectum and Canal.
		Appendix	• Identify Appendix under light Microscope • Draw & label Histological Diagram of Appendix.
		Pancreas	• Identify Pancreas under light Microscope • Draw & label Histological Diagram of Pancreas.
		Liver	• Identify Liver under light Microscope • Draw & label Histological Diagram of Liver.
		Gallbladder	• Identify Gallbladder under light Microscope • Draw & label Histological Diagram of Gallbladder.
	Urinary System	Kidneys	• Identify Kidneys under light Microscope • Draw & label Histological Diagram of Kidneys.
		Ureter	• Identify Ureter under light Microscope • Draw & label Histological Diagram of Ureter.
		Urinary Bladder	• Identify Urinary Bladder under light Microscope • Draw & label Histological Diagram of Urinary Bladder.
	Endocrine System	Pituitary Gland	• Identify Pituitary Gland under light Microscope • Draw & label Histological Diagram of Pituitary Gland.
		Adrenal Gland	• Identify Adrenal Gland under light Microscope • Draw & label Histological Diagram of Adrenal Gland.
		Thyroid Gland	• Identify Thyroid Gland under light Microscope • Draw & label Histological Diagram of Thyroid Gland.
	Reproductive System	Epidydimis, Ductus Deferens	• Identify Epidydimis, Ductus Deferens under light Microscope • Draw & label Histological Diagram of Epidydimis, Ductus Deferens.
		Prostate Gland	• Identify Prostate Gland under light Microscope • Draw & label Histological Diagram of Prostate Gland.
		Ovary	• Identify Ovary under light Microscope • Draw & label Histological Diagram of Ovary.
		Fallopian Tube	• Identify Fallopian Tube under light Microscope • Draw & label Histological Diagram of Fallopian Tube.
		Uterus	• Identify Uterus under light Microscope • Draw & label Histological Diagram of Uterus.
	Nervous System	Spinal Cord	• Identify Spinal Cord under light Microscope • Draw & label Histological Diagram of Spinal Cord.
		Cerebellum	• Identify Cerebellum under light Microscope • Draw & label Histological Diagram of Cerebellum.

		Cerebrum	• Identify Cerebrum under light Microscope • Draw & label Histological Diagram of Cerebrum.
	Eye	Eye Cornea	• Identify Eye Cornea under light Microscope • Draw & label Histological Diagram of Eye Cornea.
	Ear	Ear I (Labyrinthine System)	• Identify Ear I (Labyrinthine System under light Microscope • Draw & label Histological Diagram of Ear I (Labyrinthine System.
		Ear II (Cochlea)	• Identify Ear II (Cochlea) under light Microscope • Draw & label Histological Diagram of Ear II (Cochlea).
Abdomen Schedule (2nd Year)	**Introduction to abdomen+ Lumbar vertebrae+ sacrum**	Introduction to abdomen+ Lumbar vertebrae+sacrum	• Summarize bony characteristics of lumbar vertebrae & sacrum • Explain attachments of muscles & ligaments on lumbar vertebrae & sacrum
	Anterior Abdominal Wall	Anterior abdominal wall(surface land marks, cutaneous nerves ,arteries and veins and lymphatic vessels, muscles of anterior abdominal wall, deep nerves and arteries of anterior abdominal wall)+ clinical anatomy+ Rectus sheath and its contents old and new concepts	• Explain Nerves, arteries, veins, lymphatic vessels & muscle of anterior abdominal wall & its clinical anatomy • Discuss formation & contents of rectus sheath & its clinical anatomy • Discuss hernias of anterior abdominal wall & important abdominal incisions.
	Inguinal Region	Inguinal canal +clinical anatomy + Male external genital organs(penis, scrotum, testis, epididymis and spermatic cord)	• Explain boundaries & contents of inguinal canal & inguinal hernias & their complications • Discuss male external genital organs including penis, scrotum, testis & epididymis & spermatic cord & their clinical Anatomy • Discuss clinical significance of varicocele& hydrocele • Explain regions of abdomen • Discuss the peritoneum, peritoneal cavity, omenta, ligaments, mesenteries & possible sites of internal hernias
	Peritoneum	Regions of abdomen, Peritoneum(folds, sex differences, functions, greater and lesser omenta, mesentery, mesoappendix, transverse mesocolon, sigmoid mesocolon	

		Reflection of peritoneum on liver, peritoneal cavity, vertical and horizontal tracing, lesser sac or omental bursa, special regions of peritoneal cavity, subphrenic spaces, infracolic compartment,peritoneal fossae,clinical anatomy	
	Esophagus & Stomach	Abdominal part of esophagus and stomach, Stomach location, shape, position, size, external features, relations, interior of stomach blood supply, lymphatic, drainage, nerve supply, function + clinical Anatomy	• Explain the anatomy of abdominal part of esophagus • Discuss the location, size, shape, position, external & internal features, relations, blood supply, nerve supply & lymphatic drainage & its clinical anatomy • Discuss clinical correlates of spread of carcinoma of stomach, duodenal & peptic ulcers.

	Small & Large Intestine	Small and large intestine+ clinical anatomy. Large surface area intestinal glands, lymphatic follicles arterial supply lymphatic drainage, nerve supply function, duodenum location, length & parts, relations arterial supply, venous drainage, nerve supply, lymphatic drainage, Jejunum & ileum, blood supply, lymphatic drainage, nerve supply, Large intestine Relevant features, differences between Jejunum & Ileum, blood supply, lymph drainage, differences between small & large intestine, function of Colon, cecum, appendix ascending & descending colon, sigmoid colon + clinical anatomy.	• Explain the Gross anatomy of Duodenum, Jejunum, ileum, cecum, appendix ascending, descending colon, sigmoid colon & their clinical anatomy • Discuss clinical correlates of acute appendicitis & Appendectomy.
	Blood vessels of gut	Large blood vessels of the gut+ clinical anatomy. Coeliac trunk & its branches, superior mesenteric artery, branches, superior mesenteric vein inferior, mesenteric artery & branches, inferior mesenteric vein, marginal artery, portal vein, portosystemic Anatomoses clinical anatomy.	• Explain course, relations & branches of blood vessels of gut & their clinical anatomy.
	Extra-hepatic biliary apparatus	Introduction hepatic ducts, common hepatic duct, gall bladder, cystic duct, bile duct, arterial supply of biliary apparatus, venous drainage, lymphatic drainage, nerve supply function of gall bladder, Extra-hepatic biliary apparatus+ clinical	• Discuss anatomy of extra hepatic biliary apparatus & its clinical anatomy.

		anatomy.	
	Spleen, pancreas and liver	Spleen (location, position, external features, relations, arterial supply, venous drainage, lymphatic drainage nerve supply, functions of the spleen spleniculi) Pancreas (Location, size & shape, relations of head, neck body & tail, external features, surfaces duct of pancreas Arterial supply, venous drainage, lymphatic drainage, nerve supply, function) Liver (Location external features, lobes, relations, blood supply, venous drainage, lymphatic drainage, nerve supply, hepatic segments, function, applied anatomy)	• Explain the gross & clinical anatomy of spleen, pancreas & liver & their clinical anatomy
	Kidney and ureter	Kidney (External features, location, shape, size, weight orientation, relations of both kidneys, coverings of kidney, structure, arterial supply, venous drainage, lymphatic drainage, nerve supply, exposure of kidney from behind). Ureter, dimensions, course constrictions, relations, blood supply, nerve supply + clinical anatomy.	• Explain size, location, relations, blood supply, nerve supply, lymphatic drainage & functions of kidneys & their clinical anatomy • Discuss course, constriction, relations, blood supply, nerve supply & clinical anatomy of ureter.

	Supra renal gland and chromaffin system	Location, size, shape & weight, sheaths external features, comparison of right & left supra renal glands structure, arterial supply venous drainage, lymphatic drainage nerve supply, accessory super renal gland chromaffin system, paraganglia, para aortic bodies, coccygeal body + clinical anatomy	• Discuss gross anatomy of supra renal glands & chromaffin system. • Correlate gross anatomy to the clinical aspects.
	Diaphragm	Diaphragm Origin, insertion, openings (small, large) relations Nerve supply actions + clinical anatomy, abdominal aorta, abdominal parts of azygos and hemiazygos veins, lymph nodes of posterior abdominal wall +clinical anatomy. Abdominal Aorta & Branches, course, relations, inferior vana cava, tributaries, course relations	• Discuss attachment action, nerve supply & opening of diaphragm & its clinical anatomy • Explain course, relations, branches of abdominal aorta & its clinical anatomy • Discuss course, relations & tributaries of inferior vena cava & its clinical anatomy
	Posterior Abdominal Wall	Muscles of posterior abdominal wall, nerves of posterior abdominal wall, abdominal part of autonomic nervous system + clinical anatomy	• Elaborate the gross & clinical anatomy of muscles, nerves, veins & lymph nodes of posterior abdominal wall.
	Pelvis	Introduction to pelvis(osteology, boundaries Walls, inlet, outlet & floor of Pelvis and contents) Structures crossing the pelvic Brim +clinical anatomy	• Explain the boundaries, contents & differences between male & female pelvis • Discuss the dimensions of normal & contracted adult female pelvis their clinical importance in the mechanism of delivery.

	Perineum	Perineum (superficial and deep boundaries, division, anal region, ischioanal fossa, male and female urogenital region, perineal spaces, muscles nerves and vessels of urogenital region)+clinical anatomy	• Discuss the gross anatomy of perineal region in both male & female and the clinical significance of perineal region. • Explain the basis of birth injuries to mother in difficult labour & clinical conditions produced thereafter.
	Urinary bladder and urethra	Urinary bladder (Size, shape, position, external features, relations, ligaments of bladder, interior of bladder, capacity, Arterial supply venous drainage, lymphatic drainage nerve supply) Male Urethra (parts of urethra, posterior part (Preprostatic, prostatic & membranous) proximal & distal urethral sphincter mechanism, anterior part (Bulbar & Penile) Traumatic injury to urethra. Arterial supply, venous drainage, lymphatic drainage, nerve supply. Female Urethra (Course, relations, arteries, veins lymphatic drainage innervation, walls of urethra Micturition + clinical anatomy	• Explain gross & clinical anatomy of urinary bladder & made & female urethra & its development. • Discuss the micturition reflex.
	Joints of pelvis	Joints of pelvis +clinical Anatomy, Lumbosacral, sacrococcygeal, intercoccygeal & sacroiliac joints, factors providing stability, the mechanism of Pelvis	• Discuss lumbosacral, saccrococcygeal, intercoccygeal & sacroiliac joints & factors providing stability to pelvis & mechanism of Pelvis.
	Male reproductive organs	Male reproductive organs (ductus deferens, seminal vesicle, prostate, Batson's plexus) +clinical anatomy	• Explain the gross anatomy of ductus deferens, seminal vesicles, prostate & batson's plexus & their clinical anatomy • Discuss the anatomical facts related to bengin prostatic hyperplasia & carcinoma of prostate.

	Female reproductive organs	Female reproductive organs (ovaries, uterine tube, uterus, vagina, Vestigial remnants present in broad ligaments) + clinical anatomy	• Discuss gross & clinical anatomy of ovaries, uterine pubes, uterus, vagina • Explain the clinical importance of uterine
	Rectum and anal canal	Rectum and anal canal +clinical anatomy	• Explain the gross & clinical anatomy of rectum & anal canal. • Explain the anatomical correlates related to anal fissure, anal fistula, hemorrhoids & rectal carcinoma.
	Nerve, Vessels, Fascia & Muscles of Pelvis	Vessels of the pelvis, nerves of the pelvis, pelvic fascia and muscles+ clinical anatomy	• Explain abdomino-pelvic fascia & their clinical importance
			• Explain the anatomy of nerves vessels & muscles of pelvis & their clinical significance.
	Surface Marking & Radiological Anatomy of Abdomen & Pelvis	Surface marking of abdomen and pelvis + Radiological anatomy and imaging procedures	• Mark Important abdominal & pelvic viscera on the surface of body
			• Explain radiological anatomy of abdomen & pelvis
			• Interpret CT scans, MRI, Ultrasound & other techniques.
Head & Neck Schedule (2nd Year)	**Introduction & Scalp**	Features identified on the living face. Scalp(extent, structure, arterial supply, venous drainage, lymphatic drainage and nerve supply) + clinical aspects	• Identify features on the living face • Explain extent arterial supply venous drainage lymphatic drainage & nerve supply of scalp • Outline the highlights on important clinical aspects related to scalp.
	Superficial Temporal Region	Temple(superficial temporal region)	• Define & explain the temple.
	Land marks of Neck & Deep Fascia	Land marks on the side of neck, deep fascia of neck its different layers+ clinical aspects	• Identify landmarks
			• Explain superficial fascia of neck on the side of the neck
			• Discuss the attachments, layers & planes of deep fascia of neck & their clinical importance
	Posterior Triangle of Neck	Posterior triangle of neck(anatomy and clinical aspects), potential spaces around lower and upper jaw	• Identify & explain boundaries contents & subdivisions of posterior triangle of neck & its clinical significance • Explain the significance of potential spaces around upper & lower jaws & their clinical importance. • Explain attachments of nerve supply, actions, effect of injury & clinical tests for diagnosis of sternocleidomastoid, Trapezius & levator scapulae.

	Dissection of back of Neck	Dissection of the back(muscles of back, suboccipital triangle [boundaries, roof and floor suboccipital muscles and contents and their description)+ clinical aspects	• Explain the layers of muscles of back & arteries & veins found in the back of the neck. • Discuss the boundaries, contents of sub occipital triangle. • Explain the attachments, action & nerve supply of suboccipital muscles • Discuss the nerves & vessels of back of neck • Outline the clinical aspects related to back of neck
	Skull	Norma frontalis Norma Basalis.	• Explain Norma frontalis & basalis of skull & individual bones included within them • Discuss muscles & Ligamentous attachment on these parts of skull. • Identify & locate foramina of skull & structures passing through them.
	Anterior Triangle of Neck	Anterior triangle of neck (surface land marks, skin, superficial fascia, structures in the anterior median region of the neck, subdivision of anterior triangle and their description)+clinical anatomy	• Explain the boundaries, contents & subdivision of anterior triangle of neck. • Identify Surface landmarks on the anterior aspect of neck. • Outline superficial fascia of neck & structures in the anterior median region of the neck. • Correlate anatomical knowledge to important clinical aspects
	Cranial Cavity	Cranial cavity(cerebral dura mater folds of dura its blood and nerve supply, venous sinuses, pituitary gland, internal carotid artery cavernous part, 4th part of vertebral artery, cranial nerves in cranial cavity and petrosal nerves, trigeminal ganglion, middle meningeal artery)+clinical anatomy	• Enlist the contents of cranial cavity. • Explain folds of dura mater & its blood & nerve supply • Discuss various dural venous sinuses their relations, tributaries communications & applied anatomy. • Explain parts, relations blood supply & applied anatomy of pituitary glands • Explain the anatomy, location & meningeal relations & associated roof & branches of trigeminal ganglion • Discuss blood supply & clinical anatomy of trigeminal ganglion. • Explain course, relations branches & applied anatomy of middle meningeal artery. • Outline the course of different cranial nerves seen in the cranial fossae after removal of brain. • Discuss the internal carotid artery & its part present in the cranial cavity (Cavernous part) • Explain the anatomy of greater, lesser deep & external petrosal nerves. • Discuss brief course of 4th part of vertebral artery in the cranial cavity.
	Cervical Vertebrae	Cervical vertebrae, Atlas, axis, Vertebra Prominens & typical cervical vertebrae	• Identify typical & atypical cervical vertebrae. • Discuss the bony features of Atlas axis & vertebra prominens & typical cervical vertebrae • Outline attachments on cervical vertebrae.

	Deep Dissection of Neck	Deep dissection of neck(thyroid and parathyroid glands, thymus, subclavian and carotid arteries, subclavian, internal jugular and brachiocephalic veins, glossopharyngeal, vagus, accessory, hypoglossal, sympathetic chain, cervical plexus, lymph nodes and thoracic duct, trachea and esophagus, scalene muscles, cervical pleura and supra pleural membrane, styloid apparatus) +clinical anatomy	• Identify & discuss anatomy of thyroid, parathyroid glands, thymus, trachea & Esophagus & their applied Anatomy. • Explain the course, relations, branches of subclavian & carotid arteries & clinical aspects. • Explain the course, relations, tributaries of subclavian, internal jugular & brachiocephalic veins & clinical aspects. • Discuss functional components, course relations, branches & distribution of IX, X, XI, XII cranial Nerves & their applied anatomy. • Explain the formation of cervical flexus their branches & distribution & applied anatomy. • Identify & explain sympathetic trunk & scheme of sympathetic innervations of region. • Explain clinical aspects of sympathetic nerves & Horner's syndrome. • Explain the groups of lymph nodes in the head & neck region & their location. • Explain lymphatic drainage of head & neck & different conditions associated with lymphatic vessel. • Discuss attachments, actions & nerve supply of scalene muscles & affects of their paralysis & clinical tests applied for diagnosis. • Discuss the anatomy of suprapleural membrane & styloid apparatus & their clinical aspects.
	Prevertebral Region	Pre-vertebral region(prevertebral muscles, vertebral artery, joints of the neck)	• Explain the attachments, actions, nerve supply of prevertebral muscles, effect of injury to them & clinical tests applied for diagnosis. • Discuss the course, relations & branches of vertebral artery & its clinical aspects. • Explain intervertebral joint, their ligaments, relations & movements & their clinical aspects.
	Face	Dissection of face(skin, superficial fascia, facial muscles, motor and sensory nerve supply of face, arteries and veins of the face, lymphatic drainage of face)+clinical anatomy	• Discuss skin, superficial fascia muscles of face. • Explain motor & sensory nerve supply, blood supply & lymphatic drainage of face. • Outline the clinical aspects related to anatomy of face.
	Orbit	Orbit(fascia, extraocular muscles, vessels, nerves, lacrimal gland and lacrimal apparatus) +clinical anatomy	• Enlist the contents of orbit. • Discuss the anatomy of bony orbit. • Explain fascia of orbit & extra ocular muscles, their attachment, action, nerve supply, effect of injury to them & clinical tests applied for diagnosis. • Discuss the course, relations & branches of vessels & nerves of orbit & their clinical aspects • Explain the anatomy of lacrimal glands & lacrimal apparatus & their clinical aspects.

	Parotid	Parotid region(parotid gland--external features, relations, surfaces, borders, structures within the parotid gland, parotid duct, blood supply, nerve supply lymphatic drainage, parotid lymph nodes)+clinical anatomy	• Explain external anatomy, relations, blood, nerve supply & lymphatic drainage of parotid glands & its clinical aspects. • Enlist structures passing within the parotid gland & their relations. • Discuss parotid lymph nodes & their area of drainage.
	Temporal and Infra-temporal Region	Temporal and infra-temporal region (osteology, boundaries and contents of temporal fossa, boundaries and contents of infratemporal fossa and pterygopalatine fossa), muscles of mastication, maxillary artery, mandibular nerve, otic ganglion+clinical anatomy	• Explain osteology, boundaries & contents of temporal, infratemporal & pterygopalatine fossae. • Discuss the attachment, relations, nerve supply & actions of muscles of Mastication, effect of injury to them & clinical tests applied for their diagnosis. • Outline the course, relations & branches of Maxillary & Mandibular nerve, effect of their lesions & clinical tests applied for diagnosis. • Outline the course, relations, branches of Maxillary artery & its clinical aspects. • Explain the roots, branches & distribution of otic ganglion along with clinical & applied anatomy
	Temporo mandibular Joint	Temporo mandibular joint, ligaments, relation, movement, Nerve supply & Blood supply + clinical aspects	• Explain the articular surfaces, ligaments, relations, movements, nerve supply & blood supply of Temporo mandibular joint.
	Submandibular Region	Submandibular region suprahyoid muscles, relations of digastrics, mylohyoid and hyoglossus, submandibular salivary gland superficial and deep part submandibular duct, blood supply lymphatic drainage, nerve supply , sublingual salivary gland, submandibular ganglion)+clinical anatomy	• Explain origin, insertion, nerve supply & action of suprahyoid muscles & their clinical aspects. • Discuss relations of digastric, mylohyoid & hyoglossus muscles. • Explain the anatomy (superficial & deep parts) of submandibular glands. • Discuss the anatomy of submandibular duct & sublignual gland. • Explain the roots, branches & distribution of submandibular ganglion & its clinical aspects.
	Mouth	Mouth (oral cavity, vestibule, lips, cheeks, oral cavity proper, gums, teeth, soft palate and hard	• Identify & explain the anatomical features of the oral cavity, cheek, lips, gums & teeth, soft & hard palate.

		palate)	• Explain the clinical aspects of these structures.
	Pharynx	Pharynx (dimensions, boundaries, relations, parts, palatine tonsils, Waldayer's lymphatic ring, structure of the pharynx, muscles of the pharynx, swallowing and auditory tube) +clinical anatomy	• Discuss the dimensions, boundaries, relations, parts, structure of pharynx. • Explain the attachments, nerve supply & actions of Muscles of Pharynx & act of swallowing. • Discuss the location, function, relations, nerve supply & blood supply of palatine tonsil & applied anatomy. • Define & explain Waldayer's lymphatic ring, Killian's dehiscence. • Explain the anatomy of auditory tube. • Outline the clinical aspects of anatomy of pharynx.
	Skull	Norma lateralis / Interior of the Skull	• Identify & explain the bony features of Norma lateralis & interior of skull (cranial fossae) • Explain attachment of Muscles on norma lateralis. • Identify the foramina & structures passing through them.
	Nose & Paranasal air Sinuses	Cavity of the nose, External Nose, Nasal Septum, Lateral wall, Para nasal Air sinuses	• Explain the anatomy of External Nose, Nasal septum, lateral wall & Paranasal air sinuses & their clinical aspects • Explain Little's area on Nasal septum & its clinical importance.
	Larynx	Extent, Constitution of larynx, skeleton of larynx, laryngeal joints ligaments & membranes cavity of larynx, intrinsic muscles + Applied Anatomy	• Discuss extent, constitution skeleton joints, ligaments membranes & cavity of larynx • Explain the attachments, nerve supply & actions of intrinsic muscles of larynx. • Explain applied anatomy related to larynx.
	Mandible	Mandible + applied anatomy	• Explain bony features & attachments of Mandible & clinical aspects.
	Tongue	Tongue, Muscles, blood supply, nerve supply, lymphatic drainage, external features, oral & pharyngeal parts of tongue, papillae of tongue, structure of tongue, applied anatomy	• Explain external features, parts, papillae & structure of tongue. • Discuss attachments, nerve supply & actions of muscles of tongue & effects of their paralysis & clinical tests diagnosis. • Explain the nerve supply, blood & lymphatic drainage of tongue. • Explain applied anatomy related to tongue.
	Ear	Organ of hearing and equilibrium, external ear, tympanic membrane, middle ear, mastoid Antrim, internal ear, vestibule cochlear nerve + applied anatomy related to every topic	• Outline the anatomy of external ear, tympanic membrane, middle ear, mastoid antrum, internal ear & their applied anatomy.

	Vertebral Canal	Contents of vertebral canal	• Outline the course & relations of vestibulocochlear nerve & its clinical aspects.
	Eyeball	Eye ball, Sclera, cornea, choroid, ciliary body, retina, aqueous humor, the lens, vitreous body, applied anatomy	• Explain eyeball & its components like Sclera, cornea, choroid, ciliary body, retina, aqueous humor, the lens, vitreous body, applied anatomy
	Joints of Neck	Joints of the neck, Typical cervical joints between the lower six cervical vertebrae, special joints between Atlas, axis & occipital bone, ligaments connecting the axis with occipital bone + applied anatomy	• Discuss the anatomy of typical cervical joints between lower six cervical vertebrae & special joints between Atlas, Axis & occipital bone. • Discuss the ligaments connecting the axis with occipital bone. • Discuss dislocations of inter vertebral joints.
	Skull	Norma occipitalis	• Explain the bony features of norma occipitalis & cranial fossae. • Discuss muscle attachments on norma occipitalis.
		Cranial Fossae	• Discuss foramina & structures passing through them in the cranial fossae.
	Surface & Radiological Anatomy of Head & Neck	Surface & Radiological Anatomy of Head & Neck	• Discuss & mark important structures of Head & neck on surface.
			• Interpret normal radiographs CT scans, MRI & ultrasound images of head & neck
Brain Schedule (2nd Year)	**Introduction**	Introduction to CNS	• Explain structure & functions of Receptors & motor endplates
		Introduction to PNS	• Define CNS & PNS & their components.
	Meninges of Brain	Meninges of Brain, Dura, Arachnoid & Pia mater	• Elaborate meninges of Brain & spinal cord.
			• Explain subdural & subarachnoid spaces including subarachnoid cisterns, arachnoid villi & granulations.

	Blood Supply of Brain	Blood supply of Brain, Blood supply of spinal cord, brainstem, cerebellum & forebrain, circle of Willis.	• Enlist arteries of Brain & spinal cord & their branches. • Explain the course of major arteries of brain. • Discuss the blood supply of brain & spinal cord. • Explain the effects of hemorrhagic & thrombotic lesions.
	Base of Brain	Base of Brain, interpeduncular fossa & its structures, anterior perforated substance lamina, terminalis superficial attachments of cranial nerves, cranial nerves with ventral, lateral & dorsal attachments.	• Explain interpeduncular fossa & its structures. • Define anterior perforated substance & lamina terminalis. • Demonstrate & Discuss attachments of cranial nerves on the base of brain.
	Spinal Cord	Spinal cord, Cross section, tracts, blood supply, clinical anatomy.	• Explain & draw internal structure of spinal cord at different levels. • Trace the paths of ascending & descending tracts of spinal cord. • Explain the functions of AT/DT & effects of their lesions. • Explain Hemi section of cord & complete section of cord. • Explain the blood supply of spinal cord. • Differentiate UMNL / LMNL
	Medulla oblongata	Medulla oblongata, cross section, tracts, blood supply, clinical anatomy.	• Explain superficial & cross sectional anatomy of Medulla oblongata • Explain blood supply of Medulla oblongata. • Discuss the effects of lesions of medulla oblongata
	Pons	Pons, cross section, tracts, blood supply, clinical anatomy.	• Explain superficial & cross sectional anatomy of Pons. • Explain the blood supply of Pons. • Discuss the effects of lesions of Pons.
	Cerebellum	Cerebellum, structure, connections, functions, & clinical anatomy.	• Discuss different lobes of cerebellum its grey & white matter including deep cerebellar Nuclei. • Outline afferent & afferent connections of cerebellum. • Correlate the connections of cerebellum to function. • Explain logically signs & symptoms of cerebellar disease.
	Mid Brain	Mid brain, structure, connections, functions, & clinical anatomy.	• Explain superficial & cross sectional anatomy of mid brain. • Explain the blood supply of Midbrain. • Discuss the effects of lesions of Midbrain.
	Fourth Ventricle	Fourth Ventricle + clinical aspects.	• Explain the boundaries of 4th ventricle. • Explain its connections with other ventricles & subarachnoid space. • Discuss tela choroidea & choroid plexus of 4th ventricle.

	Cerebrum	Cerebrum (Subdivisions of the Cerebrum, General Appearance of the Cerebral Hemispheres, Main Sulci and gyri, Lobes and surfaces of the Cerebral Hemisphere, white matter of cerebral hemisphere, Brodmann's areas)	• Explain & demonstrate surfaces of cerebral hemisphere, its lobes & important sulci & Gyri. • Locate, identify & explain functions of different functional areas of brain (Brodmann's Area)
	Lateral ventricles	Lateral ventricles + clinical aspects	• Explain the parts & boundaries of different parts of lateral ventricle. • Explain its connection with 3rd ventricle. • Discuss Tela choroidea & choroid plexus of lateral ventricle.
	Deep Dissection of Cerebrum	Deep dissection of cerebral hemisphere(Commissural Fibers including corpus callosum, anterior commissure, posterior commissure, fornix, The habenular commissure, Association Fibers, Projection Fibers including internal capsule, Septum Pellucidum, Tela Choroidea)+ clinical aspects	• Locate, Identify & explain different types of projection, commissural & associational fibers of brain and their functions.
	Choroid fissure, optic tract	Choroid fissure, optic tract + clinical aspects	• Define choroid fissure & its importance. • Explain the visual pathway & the effects of lesions at different levels.
	Basal Nuclei	Deep nuclei of telencephalon(basal nuclei and their connections)+ clinical aspects	• Enumerate basal nuclei of telencephalon. • Discuss the connections of Basal Nuclei & relate these connections to their functions. • Discuss the effects of various lesions of Basal Nuclei with emphasis of on the Parkinsonism.

	Hypothalamus	Hypothalamus, its nuclei and its connections+ clinical aspects	• Identify locate & explain hypothalamus, its connections, Nuclei & functions. • Explain the effects of lesion of hypothalamus. • Discuss blood supply of hypothalamus.
	Thalamus	Thalami and its connections and nuclei+ clinical aspects	• Identify, locate & explain thalamus, its Nuclei & connection & functions.
	Third ventricle	Third ventricle + clinical aspects	• Explain the boundaries of 3rd ventricle. • Discuss its connections with lateral & 4th ventricles. • Outline the telechoriodea & choroid plexus of 3rd ventricle. • Discuss the hydrocephalus & its types.
	Diencephelon	Subthalamus, epithalamus, metathalamus+ clinical aspects	• Identify, locate & explain metathalamus, subthalamus, epithalamus their connections & functions.
	Reticular formation	Reticular formation and limbic system + clinical aspects	• Explain the location, connection & functions of reticular formation. • Discuss the effects of lesion of reticular formation. • Explain the structures present in the limbic system. • Discuss the connections & functions of limbic system. • Interpret the effects of lesion of limbic system.
	Ventricular System	Ventricular system and formation and fate of CSF, blood brain and blood CSF barriers.	• Explain ventricular system of brain. • Discuss production & circulation of CSF & Clinical conditions associated with it. • Discuss blood brain & blood CSF barriers.
	Cranial Nerve	Cranial nerve nuclei and their connections	• Identify locate & explain cranial nerve Nuclei & their connections.
			• Discuss the functional components of cranial nerves.
	Autonomic Nervous System	Sympathetic & Parasympathetic Nervous System	• Explain Anatomical basis of Sympathetic & parasympathetic Nervous system. • Explain their comparative functions. • Discuss the effects of lesion of sympathetic & parasympathetic nervous system.

Recommended Books

1. Gray‟s Anatomy by Prof. Susan Standring, 39th edition (asreference book).
2. Clinical anatomy for medical students by Richard Snell.
3. Clinically oriented anatomy by Keith Moore.
4. Clinical anatomy by R. J. Last (latest edition).
5. Cunningham‟s Manual of Practical Anatomy by G J Romanes. Latest edition Vol. I, II and III.
6. The developing human, Clinically Oriented Embryology by Keith Moore. (Latest edition).
7. Embryology by Langmann (Latest edition).
8. Wheaters, Functional Histology by Young and Heath (Latest edition)
9. Histology. A Text and Atlas by Ross & Romrell (Latest edition).
10. Medical histology by Prof. Laiq Hussain.
11. Histology by Janquero (Latest edition)
12. Barr‟s the Human Nervous system: anatomical view point (Latest edition).
13. Neuroanatomy by Richard S. Snell (Latest edition).
14. Netter‟s Atlas of Gross anatomy (Latestedition).
15. Mariano De Flore atlas of Histology (Latest edition).
16. Digital atlas of microscopic anatomy by Khalid Khan

TABLE OF SPECIFICATIONS FOR ANATOMY

THEORY PAPER FIRST PROFESSIONAL

CONTENTS		SEQs	MCQs
1.	Digestive system, urinary system, nervous system, male and female reproductive systems, endocrine glands special senses(Histology)	01	06
2.	Digestive system, body cavities, respiratory system, urogenital system, cardiovascular system, pharyngeal apparatus and face, nervous system, eye and ear (Embryology)	02	10
3.	Brain and spinal cord	01	07
4.	Abdomen and pelvis	03	09
5.	Head and neck	02	13
TOTAL ITEMS		**09 SEQs**	**45 MCQs**
TOTAL MARKS		**45 Marks**	**45 Marks**

25% of MCQs and SEQs should be clinically oriented or problem- based.

10% *marks are allocated for 'Internal Assessment'*

Total marks for theory paper: SEQ+ MCQ + Internal Assessment = 45 +45+10=***100 Marks***

ORAL AND PRACTICAL EXAMINATION FIRST PROFESSIONAL

Oral and practical examination carries 100 marks.

EXAMINATION COMPONENT		MARKS
A	**Internal Assessment**	10
B	**Viva voce** Head and neck=10 Marks Abdomen=10 Marks Pelvis =04 Marks Brain and spinal cord=08 Surface marking=04 Marks Special Embryology=10 Marks	46
C	**OSPE (Gross Anatomy and embryology)** a) Head and neck 06 marks b) Abdomen 06 Marks c) Pelvis 02 Marks d) Brain 04 marks e) Radiological Anatomy 02 Marks f) Special Embryology 04 **Histology** 10 slides 10 Marks 0.5 mark for identification 0.25 marks each for two points of identification	24 10 Total= 24+10=34
D	**Practical** Long slide : 10 Marks a) Identification: 1 Mark b) Drawing : 1 Mark c) Labeling : 1 Mark d) Interactive viva long slide : 7	10 Grand total for OSPE and practical= 24+10+10= 44 marks