Contents

STUDY GUIDE
1st Year BDS
Anatomy

Description:

Anatomy department is one of the most important department and a major pillar of the basic Medical / Dental sciences. The subject Anatomy enhances the knowledge, skills and abilities of undergraduate students to correlate and compare the normal anatomical structures with the pathological disease state. Thus, it familiarize the students with the Anatomy of the human body serving as a platform for future clinical practice. Anatomy is considered as the backbone of all preclinical and clinical subjects encompassing General Anatomy, Gross Anatomy, Microscopic Anatomy (Histology), Developmental Anatomy (Embryology) and Neuro-anatomy. All the branches are taught in close integration with other basic and clinical subjects. Teaching modalities such as LGFs, large group interactive sessions, small group discussions, practicals, and demonstrations are effectively incorporated.

Program	Bachelor of Dental Surgery
Course Name	Anatomy
Contact Hours	150 hours LGF 200 hours Practical
Infrastructure Requirements	Lecture Hall Museum Histology Lab (Equipped with multimedia system)

Faculty Responsible for Course Conduction:

Sr. No	Faculty	Designation
1	**Dr Nida Qasim Hayat**	**HOD, BDS Anatomy**
2	**Dr Momina Shakoor**	**Lecturer**
3	**Dr Khushbakht**	**Lecturer**

Details Of Supporting Staff:

Sr. No	Staff	Designation
1	**Nadeem**	**Computer Operator**
2	**Mr Muhammad Ilyas**	**Technician**
3	**Miss Faiza Farhan**	**Lab Assistant**
4	**Miss Saira Ilyas**	**Museum Coordinator**
5	**Mr. Rafi**	**Office Attendant**
6	**Mr. Zaman**	**Dissection Hall Attendant**
7	**Qazi Shahzaib**	**Office Attendant**

Objectives & Learning Strategies/TOS:

S.no	Topics	Intended learning outcomes (ILOS)	Teaching Strategy	Teaching Hours	Assessment Tools
1	General Anatomy	Intended learning outcomes (ILOS) Topic vice At the End of the course students will be able to:	LGF SGF	350	MCQs SEQs Presentations OSPE
1	**Anatomy and its sub branches**	➢ Define anatomy and its branches ➢ Describe purpose of study of anatomy and its branches	LGF	2 hours	MCQs SEQs
2	**Organization of human body**.	➢ Describe the levels of organization of human body	LGF	2 hours	MCQs SEQs
3	**Anatomical terms**	➢ Describe the anatomical terms for planes, position and movements	LGF/ Demonstration on Model	2 hours	MCQs SEQs
4	**Classification of Bones**	➢ Describe the structure and function of bone ➢ Classify bones on the basis of length and shape. ➢ Identify the markings on bone ➢ Explain the neuro vascular supply of bone	LGF/ Demonstration on Model	2 hours	MCQs SEQs

5	**Cartilage**	➢ Describe cartilage ➢ Classify the types of cartilage ➢ Describe the types of cartilages ➢ Explain the neuro vascular supply of cartilages ➢ Describe the functions of cartilages	LGF	2 hours	MCQs SEQs
6	**Introduction to Joints**	➢ Classify joints on the basis of structure. ➢ Describe the mechanism of movements of joint.	LGF/ Demonstration on Model	2 hours	MCQs SEQs
7	**Muscles**	➢ Describe various muscle types along with structure	LGF/ Demonstration on Model LGF/	1 hour	MCQs SEQs
8	**Skin/Integumentary systemSkin (dermis & epidermis) Skin creases, Nails, Hairs, Glands (Sebaceous &sweat)**	➢ Discuss the anatomical structures of Skin / Integumentary system	Demonstration on Model	2 hours	MCQs SEQs
9	**Lymphatic system**	➢ Describe the lymphatic system. ➢ Explain the functions of lymphatic system ➢ Describe the	LGF	1 hour	MCQs SEQs

		organization of lymphatic system ➢ Explain the mechanisms for the movement of lymph in the body.			
10	**Nervous system Divisions: central nervous system peripheral nervous system Autonomic Nervous system Sympathetic. parasympathetic**	➢ Define the organization of nervous system ➢ Describe the divisions of nervous system ➢ Describe the formation of spinal nerve and concept of dermatome and myotome ➢ Describe the formation of nerve plexus. ➢ Describe the organization of autonomic nervous system ➢ Differentiate between sympathetic and parasympathetic nervous system on the basis of structure.	LGF	3 hours	MCQs SEQs Presentation
11	**Mucous membrane Serous membrane Fascia Ligaments and raphe**	➢ Describe the anatomy and significance of fascia, ligaments and raphe.	LGF	2 hours	MCQs SEQs

2.	Head And Neck	Intended learning outcomes (ILOS) Topic vice	LGF 40hours SGF 20hours	Teaching Hours 350	MCQs SEQs OSPE Presentation
1	**Osteology of mandible**	➢ Describe the gross features of adult mandible. ➢ Describe the bony features of mandible. ➢ Differentiate between neonatal and adult mandible. ➢ Name the joints formed by mandible ➢ Name the attachment of muscles and ligaments on mandible	LGF/ Demonstration on Bone model	2 Hours	MCQs OSPE
2	**Norma frontalis**	Describe the bony features of frontal view of skull	LGF/ Demonstration on Bone model	3 Hours	MCQs OSPE
3	**Norma basalis**	➢ Name the bones forming the base of skull ➢ Name the bony features ➢ Identify the different foramina and name the structures passing through these foramina ➢ Describe the	LGF/ Demonstration on Bone model	2 Hours	MCQs OSPE

		attachment and relation of base of skull.			
4	**Norma lateralis**	➢ Name the boundaries of temporal fossa ➢ Enumerate the contents of temporal fossa ➢ Describe the relations of temporal fossa ➢ Name the boundaries of infratemporal fossa ➢ Enlist the contents of fossa ➢ Describe the relations of Infratemporal fossa	LGF/ Demonstration on Bone model	2 Hours	MCQs OSPE
5	**Scalp and muscles of facial expression**	➢ Name the layers of scalp ➢ Describe the muscles of scalp ➢ Name the neurovascular supply of scalp ➢ Describe the lymphatic drainage of scalp ➢ Name the facial muscles along with attachments, nerve supply and actions	LGF	2 Hours	MCQs SEQs OSPE
6	**Muscles of mastication**	➢ Enumerate the muscles of	LGF	3 Hours	MCQs SEQs OSPE

		mastication along with their attachments, nerve supply and actions			
7	**Blood supply and lymphatic drainage of face**	➢ Describe the blood supply and lymphatic drainage of face portion	LGF	2 Hours	MCQs SEQs OSPE
8	**Temporomandibular joint (TMJ)**	➢ Name the type of TMJ ➢ Name the ligaments related with TMJ ➢ Describe the relations of TMJ ➢ Name the muscles causing movements of TMJ ➢ Name the neurovascular supply of TMJ	LGF/ Demonstration on models	3 hours	MCQs SEQs OSPE
9	**Course of CN VII**	➢ Describe the Intra and extra cranial course of CN VII along with its clinical importance	LGF	2 Hours	MCQs SEQs OSPE
10	**Typical cervical vertebra**	➢ Describe the bony features of typical cervical vertebrae ➢ Name the joints formed by typical vertebrae ➢ Describe the attachments	LGF/ Demonstration on Bone model	3 Hours	MCQs OSPE
11	**Atypical cervical**	➢ Describe the bony	LGF/	2 Hours	MCQs

	vertebra	features of atypical cervical vertebrae ➢ Name the joints formed by atypical vertebrae ➢ Describe the attachments	Demonstration on Bone model		OSPE
12	**Hyoid bone**	➢ Describe the bony features of hyoid bone ➢ Describe the attachments of muscles and ligaments with hyoid bone	LGF/ Demonstration on model	3 Hours	MCQs OSPE
13	**Pterygopalatine fossa**	➢ Name the boundaries of pterygopalatine fossa ➢ Enumerate the contents of pterygopalatine fossa ➢ Describe the relations of pterygopalatine fossa	LGF/ Demonstration on Bone model	2 Hours	MCQs SEQs OSPE
14	**Deep fascia of neck**	➢ Enumerate the layers of deep cervical fascia ➢ Draw and labelled diagram of transverse section of neck showing deep cervical fascia ➢ Describe the layers of deep	LGF/ Demonstration on Bone model	2 Hours	MCQs SEQs

		cervical fascia along with its clinical importance			
15	**Larynx**	➢ Name the paired and unpaired cartilages of larynx ➢ Enumerate the ligaments and membrane of larynx ➢ Describe the sensory and blood supply of larynx ➢ Enumerate the intrinsic and extrinsic muscle of larynx along with its actions and nerve supply ➢ Describe the pyriform fossa	LGF/ Demonstration on model	2 Hours	MCQs SEQs OSPE
16	**Anterior triangle of neck**	➢ Enlist the subdivisions of anterior triangle of neck ➢ Describe the boundaries and contents of submental triangle ➢ Describe the boundaries and contents of carotid triangle ➢ Describe the boundaries and contents of	LGF	2 Hours	MCQs SEQs OSPE

		digastric triangle ➢ Write the boundaries and contents of muscular triangle			
17	**Posterior triangle of neck**	➢ Tell the subdivisions of posterior triangle of neck ➢ Describe the boundaries and contents of occipital triangle ➢ Describe the boundaries and contents of supraclavicular triangle	LGF	2 Hours	MCQs SEQs OSPE
18	**Arteries of neck**	➢ Illustrate the course, Distribution and branches of main arteries of neck	LGF	3 Hours	MCQs SEQs OSPE
19	**Veins of neck**	➢ Illustrate the course, Draining and tributaries of main veins of neck	LGF	2 Hours	MCQs SEQs OSPE
20	**Cervical plexus and nerves of neck**	➢ Describe the cervical plexus along with its branches and distribution	LGF	3 Hours	MCQs SEQs OSPE
21	**Nose and paranasal sinuses**	➢ Describe the external features of nose ➢ Describe the relations of nose with other	LGF/ Demonstration on model	2 Hours	MCQs SEQs OSPE

		structures ➢ Describe the nasal septum ➢ Describe the lateral wall of nose ➢ Name the neurovascular supply of nose ➢ Describe the olfactory nerve ➢ Describe the paranasal sinuses along with its clinical importance			
22	Tongue	➢ Describe the mucosa and muscles of tongue along with its attachments, nerve supply and actions	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE
23	**Salivary glands**	➢ Name the salivary glands ➢ Describe the location of each gland ➢ Describe the relations of each gland ➢ Name the nerve supply ➢ Describe the drainage of salivary glands along with its importance	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE
24	**Palate (hard & soft)**	➢ Name the bones	LGF/	2 Hours	MCQs

		forming the hard palate ➢ Describe the soft palate along with its muscles, attachments and nerve supply ➢ Describe the relations of palate ➢ Name the neurovascular supply of palate	Demonstration on Bone model		SEQs OSPE
25	Pharynx	➢ Enumerate the division of pharynx ➢ Describe the nasopharynx with its clinical significance ➢ Describe the oropharynx with its clinical significance ➢ Describe the laryngopharynx with its clinical significance ➢ Enlist the muscles of pharynx with its nerve supply and actions	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE
26	**Course of CN IX, X, XII**	➢ Illustrate the Intra and extra cranial course of CN IX, X, XI and XII	LGF	2 Hours	MCQs SEQs OSPE
27	**Bony orbit**	➢ Name the bones forming the bony orbit ➢ Identify the	LGF/ Demonstration on Bone model	3 Hours	MCQs SEQs OSPE

		foramina, fissures, and fossae associated with the orbit and what are the structures transmitted through these openings.			
28	**Eye ball**	➢ Name the contents of orbit ➢ Name the layers of eyeball ➢ Describe the fibrous layer of eyeball ➢ Describe the pigmented layers of eyeball ➢ Describe the inner nervous layer of eyeball ➢ Describe the chambers of eyeball ➢ Describe the secretion and drainage of aqueous humor and vitreous humor ➢ Describe the neurovascular supply of eye ➢ Describe the intra and extraoccular muscles with their attachment,	LGF/ Demonstration on model	2 Hours	MCQs SEQs OSPE

		actions and nerve supply			
29	**Extra cranial course of CN II, III, IV, VI**	➢ Describe the course of optic, occulomotor, trochlear and ➢ abducent nerve with clinical importance	LGF	2 Hours	MCQs SEQs OSPE
30	**External and middle ear**	➢ Describe the auricle ➢ Describe the external auditory meatus with clinical importance ➢ Name the neurovascular supply of external ear ➢ Name the boundaries of middle ear ➢ Describe the contents of middle ear ➢ Describe the auditory tube along with its clinical importance	LGF/ Demonstration on model	2 Hours	MCQs SEQs OSPE
31	**Inner ear**	➢ Describe the bony labyrinth ➢ Describe the membranous labyrinth	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE
32	**Course of CN VIII**	➢ Describe the course & clinical importance	LGF	2 Hours	MCQs SEQs OSPE

3	Neuroanatomy Topics	Intended learning outcomes (ILOS) Topic vice At the End of the course students will be able to:	LGF SGF	Teaching Hours 350	Assessment Tools MCQs SEQs Presentations OSPE
1	**Overview of nervous system**	➢ Describe the general features of neurons and its classification ➢ Differentiate between central and peripheral nervous system. ➢ Describe the general features of brain (forebrain, midbrain and hindbrain)	LGF/ Demonstration on model	3 Hours	MCQs SEQs
2	**Externals features of Spinal Cord**	➢ Describe the general features of spinal cord including its enlargements at different levels ➢ Describe the general features of cranial and spinal nerves ➢ Differentiate between the anatomical aspects of sympathetic and parasympathetic system	LGF	2 Hours	MCQs SEQs

3	**Internal structure of Spinal Cord**	➢ Describe the shape, grooves and sulci and extension of spinal cord ➢ Enlist the segments of spinal cord ➢ Differentiate between white and grey matter of spinal cord ➢ Describe the meningeal covering of spinal cord ➢ Describe the blood supply of spinal cord	LGF/ Demonstration on model	3 Hours	MCQs SEQs
4	**Grey matter of spinal cord**	➢ Describe the distribution of spinal cord into horns ➢ Differentiate between anterior, lateral and posterior horns ➢ Describe the distribution of sensory and motor neuron within the grey matter ➢ Explain formation of Rexed lamina of spinal cord	LGF/ Demonstration on model	2 Hours	MCQs SEQs
5	**Tracts of spinal cord**	➢ Enumerate & draw the ascending tracts	LGF	2 hours	MCQs SEQs

		➢ Explain the origin, pathway and termination of dorsal column medial lemniscal system ➢ Explain the origin, pathway and termination of anterolateral spinothalamic tract. ➢ Enumerate & draw the descending tracts ➢ Illustrate the origin, pathway and termination of pyramidal tracts ➢ Explain the origin, pathway and termination of extrapyramidal tracts ➢ Differentiate between pyramidal and extrapyramidal tracts			
6	**Brain stem**	➢ Enlist the components of brain stem ➢ Describe the external features of brainstem	LGF/ Demonstration on model	2 Hours	MCQs SEQs
7	**Medulla**	➢ Draw the transverse section of medulla at the	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE

		level of sensory decussation, motor decussation and inferior Olivary nuclei ➢ Enumerate the cranial nerves nuclei present within the medulla			
8	**Pons**	➢ Draw the transverse section of pons at the level of cranial and caudal parts ➢ Enumerate the cranial nerves nuclei present within the pons	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE
9	**Midbrain**	➢ Draw the transverse section of Midbrain at the level of superior colliculus and inferior colliculus ➢ Enumerate the cranial nerves nuclei present within the midbrain	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE
10	**Cerebrum** •Grey matter of cerebrum	➢ Indicate the divisions of cerebrum into different lobes, its surfaces, sulci and gyri ➢ Illustrate the distribution of grey matter in	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE

	•White matter of cerebrum	cerebral hemispheres ➢ Enumerate the types of white matter fibers ➢ Differentiate between association, projection and commissural fibers ➢ Detailed account of corpus callosum			
11	**Diencephalon**	➢ Identify the structure and locate important nuclei of Thalamus and Hypothalamus	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE
12	**Blood supply of brain**	➢ Describe & draw the formation of circle of Willis	LGF/ Demonstration on model	2 Hours	MCQs SEQs OSPE
13	Basal nuclei	➢ Enumerate the components of basal nuclei ➢ Describe the structure and relation of corpus striatum, red nucleus and substantia nigra	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE
14	**Cerebellum**	➢ Describe the general features of cerebellum ➢ Name the lobes of cerebellum and discuss its anatomical and	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE Presentations

		physiological classification ➢ Enumerate the intracerebellar nuclei of cerebellum ➢ Describe the input and output of cerebellum			
15	**Dural venous sinus**	➢ Differentiate between paired and unpaired venous sinuses ➢ Discuss the structure and drainage of individual venous sinuses	LGF/ Demonstration on model	3 Hours	MCQs SEQs OSPE Presentations
16	**CSF in ventricular system**	➢ Discuss the structure of choroidal plexus and the formation of CSF in ventricles	LGF	2 Hours	MCQs SEQs OSPE Presentations

4	Histology Topics	Intended learning outcomes (ILOS) At the End of the topic students will be able to:	Teaching Strategy SGF Practical	Teaching Hours 350	Assessment Tools MCQs SEQs OSPE Presentations
1	**Cell structure and its Organelles**	➢ Describe the cell as a living unit of body. ➢ Draw the structure of cell and its organelles ➢ Draw the structure of cytoplasmic organelles of the cell & correlate it with their functions)	SGF	3 Hours	MCQs SEQs OSPE Presentations
2	**Nuclear structure & components**	➢ Describe the structure of the nucleus, nucleolus & chromosome and their functions in cell integrity	SGF	2 Hours	MCQs SEQs OSPE Presentations
3	**Cell Division Mitosis**	➢ Explain the process of cell division, ➢ Describe mitotic cell division with its stages	SGF	3 Hours	MCQs SEQs OSPE Presentations
4	**Meiosis**	➢ Explain the process of Meiosis. ➢ Describe karyotyping. ➢ Explain the non-disjunction of chromosomes. ➢ Correlate the process of non-disjunction with chromosomal abnormalities	SGF	2 Hours	MCQs SEQs OSPE Presentations
5	**Epithelial tissues**	➢ Classification of epithelium. ➢ General characteristics and Functions of epithelium. ➢ Classify epithelium (describe the general features of epithelium;	SGF	3 Hours	MCQs SEQs OSPE Presentations

		explain the specialized functions of different types of epithelial cells). ➢ Describe the structure of main types of cell junctions			
6	**Glandular Epithelium**	➢ Enlist glandular epithelia. ➢ Classify them on the basis of morphology, nature of secretion and mode of secretion. ➢ Differentiate between exocrine & endocrine glands on the basis of structure and function	SGF	2 Hours	MCQs SEQs OSPE Presentations
7	**Epithelial Cell Surface Specialization**	➢ Describe the surface specialization of epithelia ➢ Correlate their structure, with their location and function	SGF	1 Hours	MCQs SEQs OSPE Presentations
8	**Structure & Function of Basement Membrane**	➢ Describe & draw the structure of basement membrane & correlate it with its function	SGF	3 Hours	MCQs SEQs OSPE Presentations
9	**Connective tissue**	➢ Define connective tissue. ➢ Classify connective tissues. ➢ Explain & draw the different types of Connective tissues	SGF	2 Hours	MCQs SEQs OSPE Presentations
10	**Bone**	➢ Define and identify compact and spongy bone. ➢ Describe and identify bone matrix (organic and inorganic component) ➢ Describe and identify cells of	SGF	3 Hours	MCQs SEQs OSPE Presentations

		boney tissue i.e. (osteoprogenitor, osteoblasts, osteoclast, and osteocytes) ➢ Describe and identify periosteum and endosperm ➢ Describe and identify the microscopic structure of bone i.e. (primary bone, secondary bone and haversian system) ➢ Describe Functions of various bone cells ➢ Describe important Functions and its role in calcium metabolism ➢ Recognize bone and its functions and composition. ➢ Differentiate between woven bone and lamellar bone. ➢ Differentiate between compact bone and spongy bone. ➢ Describe the applied aspect of bone ➢ Identify three types of bone on microscopy, including distinctive features of each. ➢ Describe the structural basis of classification			
11	**Cartilage**	➢ Describe the General properties of cartilage ➢ Describe the Different types of cartilage ➢ Describe the Hyaline, Elastic and Fibrocartilage	SGF	3 Hours	MCQs SEQs OSPE Presentations

		➢ Explain the growth of cartilage ➢ Identify types of cartilages on microscopy, including distinctive features of each. ➢ Describe the structural basis. ➢ Classify and distinguish three types of cartilages ➢ Describe the microscopic structure of hyaline cartilage ➢ Describe the microscopic structure of Elastic cartilage ➢ Describe the microscopic structure of fibrous cartilage ➢ Describe & draw important functional correlates of three types of cartilages			
12	**Muscles**	➢ Identify three types of muscles on microscopy, including distinctive features of each muscle fiber. ➢ Describe the structural basis of muscle striations. ➢ Recognize the structural elements that produce muscle contraction and brings the movement of a body part. ➢ Recognize the function and organization of the connective tissue in muscle. ➢ Classify and distinguish three types of muscles	SGF/Practical	2 Hours	MCQs SEQs OSPE Presentations

		➢ Describe the microscopic structure of skeletal muscle ➢ Describe important functional correlates of skeletal, smooth ➢ Describe the microscopic structure of smooth muscle ➢ Identify/Describe the microscopic structure of cardiac muscle fiber ➢ Describe important functional correlates of cardiac muscle fiber			
13	**Spinal Cord**	➢ Identify the light microscopic transverse section of spinal cord at cervical, thoracic, lumbar and sacral regions) ➢ Draw the transverse section of thoracic segment of spinal cord-2(Identify the slide of transverse section of thoracic segments of spinal cord under the microscope). ➢ Identify the transverse section of lumbar spinal cord-Identify the slide of transverse section of Lumbar segment of spinal cord under the microscope.	SGF/ Practical	2 Hours	MCQs SEQs OSPE Presentations
14	**Cerebral cortex**	➢ Identify the cerebral cortex on light microscope Enlist the different	SGF/ Practical	3 Hours	MCQs SEQs OSPE Presentations

		histological layers of cerebral cortex			
15	**Cerebellum**	➢ Identify the cerebellar cortex on light microscope ➢ Enlist & draw the different histological layers of cerebellar cortex	SGF/ Practical	2 Hours	MCQs SCQs OSPE Presentation
16	**Lymphoid organ**	➢ Identify and describe the microscopic anatomy of lymph node, thymus, bone marrow and spleen under microscope. ➢ 2. Compare the histological features of lymph node, thymus and spleen ➢ 3. Describe the overview of lymphatic tissue including MALT ➢ 4. Identify and describe the histological features and functions of Lymph node ➢ 5. Identify and describe the histological features and functions of Thymus ➢ 6. Identify the locations of tonsils and describe the histological features and functions of Tonsils	SGF/ Practical	3 Hours	MCQs SEQs OSPE Presentations
17	**Cardiac muscles**	➢ Explain the characteristics of cardiac muscle cell. ➢ Explain the Structure of Intercalated disc	SGF/ Practical	3 Hours	MCQs SEQs OSPE Presentations

		➢ Define the junctional specializations making up the intercalated disk ➢ Describe identification of different microscopic views of Cardiac muscle and its ultra-structures ➢ Differentiate histologically between cardiac and skeletal muscle and smooth muscles ➢ Enumerate histological layers of heart wall			
18	**Blood vessels**	➢ Describe the histological composition of vessel ➢ Describe the microscopic structure of artery and vein ➢ Differentiate histologically between artery and vein under light microscope ➢ Describe the histological composition of lymphatic channels	SGF/Practical	2 Hours	MCQs SEQs OSPE Presentations
19	**Integumentary system**	➢ Describe the layers of skin	SGF/Practical	3 Hours	MCQs SEQs OSPE Presentations
20	**The digestive system**	➢ Identify & describe the features of oral cavity ➢ Describe tongue, teeth, gums, pharynx, hard palate, soft palate and lips. ➢ Draw the histological features of salivary glands	SGF/ Practical	2 Hours	MCQs SEQs OSPE Presentations

5	Embryology	Intended learning outcomes (ILOS) At the End of course the students will be able to:	Teaching Strategy LGF 20hours	Teaching Hours 350	Assessment Tool MCQs SEQs OSPE Presentation
1	**1. Introduction to Embryology.**	➢ Define descriptive terms in embryology, planes & sections. ➢ Explain the significance of embryology, basic genetics & molecular regulation.	LGFs	2 hours	MCQs SEQs OSPE Presentation
2	**Male & Female Reproductive systems**	➢ Describe & draw the structure & functions of testis,Vas deferens, Epididymis, Ductus deferens, Ejaculatory ducts,Accessory glands,Male external genitalia, Ovaries, uterine tubes, uterus & uterine cycle, accessory glands	LGFs	3 hours	MCQs SEQs OSPE Presentation
3	**Mitosis & Meiosis**	➢ Illustrate various phases of cell division, ➢ Differentiate between mitosis & meiosis	LGFs	2 hours	MCQs SEQs OSPE Presentation
4	**Gametogenesis**	➢ Differentiate between spermatogenesis & spermiogenesis ➢ Differentiate between oogenesis & how it differs from spermatogenesis	LGFs	1 hours	MCQs SEQs OSPE Presentation
5	**Transport of gametes & Fertilization**	➢ Describe sperm transport, capacitation, ovulation & ovum transport. ➢ Describe the phases of fertilization & its outcomes	LGFs	1 hours	MCQs SEQs OSPE Presentation
6	**First week of development**	➢ Describe the cleavage & formation of	LGFs	2 hours	MCQs SEQs OSPE

		morula & blastocyst. ➢ Explain the beginning of implantation.			Presentation
7	**Second week of development**	➢ Explain the formation of bilaminar germ disc, Amniotic cavity,Primitive yolk sac, Extraembryonic mesoderm, Chorionic cavity, secondary yolk sac & completion of implantation.	LGFs	2 hours	MCQs SEQs OSPE Presentation
8	**Third week of development**	➢ Describe the gastrulation, development of notochord, Trilaminar germ disc,Organization of intraembryonic mesoderm, Formation of intraembryonic coelom, Formation of neural tube, Formation of primitive CVS,Vasculogenesis & angiogenesis, Development of chorionic villi.	LGFs	2 hours	MCQs SEQs OSPE Presentation
9	**Fourth week of development**	➢ Explain the process of neurulation, ➢ Describe & illustrate the folding of embryo, ➢ Define the development of somites, ➢ Interpret the organogenesis & derivatives of neural crest cells, Ectoderm, Mesoderm, endoderm.	LGFs	2 hours	MCQs SEQs OSPE Presentation
10	**Fifth to Eight weeks of development.**	➢ Illustrate the changes in the flexure of body, ➢ Describe the	LGFs	2 hours	MCQs SEQs OSPE Presentation

		development of face, Eyes, Ears & limbs.			
11	**Development of Head and Neck**	➢ Outline the pharyngeal arches Pharyngeal pouches Pharyngeal cleft and membranes ➢ Describe the development of Tongue, Development of Thyroid gland, Development of Face, Development of Palate, Development of Eye, Development of Ear	LGFs	6 hours	MCQs SEQs OSPE Presentation

Written Paper Anatomy

Multiple Choice Questions	45MCQs each carry 1mark	45 marks
Short Essay Questions	11SEQs each carry 5marks Attempt only 9 SEQs out of 11	45marks
Internal Assessment		10marks
Total Paper Marks		**100marks**

Viva and OSPE Anatomy

Internal Examiner Viva		20marks
External Examiner Viva		20marks
OSPE	10 stations each carry 5marks	50marks
Histology Practical Notebook		5marks
Gross Anatomy Sketch Notebook		5marks
Total Viva OSPE Marks		**100marks**

Learning Resources:

Sr.No	Text/ Reference Books	Edition
1	**Human Anatomy B.D Chaurasia**	**6th**
2	**Grey's Anatomy**	**4th**
3	**Medical Histology**	**5th**
4	**Langman's Medical embryology**	**14th**
5	**Snell's Clinical Anatomy**	**10th & 11th**
6	**Atlas of human anatomy**	**7th**
7	**Atlas of histology**	**9th**
8	**Snell's Clinical Neuroanatomy**	**8th**

Additional Learning Resources:

Hands on	**Museum / Histology Lab**
Skills Lab	**Histology Lab**
Videos	**https://youtu.be/NVsrexn3pT8?si=6QpPyB_J-xqYJFng , https://youtu.be/K-qtoLS3L4w?si=McyOflJvdN4YVg8J**
Internet Resources	**B & B, Dr Najeebs LGFs, Anatomy Zone, Kenhub, www.wmcmis.com, WMC library,**

Assessment Methods:

MCQs:

Multiple Choice questions; Single best Type

OSPE/OSCE: Objective Structured Practical/Clinical examination

Presentation:

Multiple Choice Questions:

1. Single best type MCQs having five options with one correct answer and four distractors are part of assessment.
2. Correct answer carries one mark, and incorrect will be marked zero. Rule of negative marking is not applicable.
3. Students mark their responses on specified computer-based designed sheet.

Objective Structured Practical/Clinical Examination

1. Nine OSCE stations are used for formative as well as summative assessment.
2. Time allocated for each station is five minutes as per Examination rules of Khyber Medical University, Peshawar.
3. All students are rotated through the same stations.
4. Stations used are un observed, observed, interactive and rest stations.
5. On unobserved stations, models, lab reports, radiographs, flowcharts, case scenarios may be used to assess cognitive domain.
6. On observed station, examiners don't interact with candidate and just observe the performance of skills /procedures.
7. On interactive station, examiner ask questions related to the task within the allocated time.
8. On rest station, students are not given any task. They just wait to move to the next station.

Presentation:

Students are given topics for presentation either individually or in groups. They are encouraged to prepare presentations on power point to enhance
their understanding of the topic.

Internal Assessment Criteria:

1. 10% weightage of Internal Assessment in professional exam is policy of Khyber Medical University.
2. This Internal Assessment will comprise of following components

    a) Attendance
    b) Class presentations
    c) Monthly tests
    d) Midterms
    e) Pre-Prof

Examination Rules & Regulations:

1. One class test of the subject may be held monthly, marks of which will be included in internal assessment. Marks for class test can vary according to syllabus and teachers' choice.
2. Mid-Term exam comprising 45 MCQs of single best type and 45 marks SEQs will be held in the middle of the session.
3. Pre-prof Exam comprising 45 MCQs of single best type and 45 marks SEQs will be conducted at the end of session before prep leaves.
4. The pattern of class tests, Mid-term & Pre-prof will be same as the Professional Exam taken by Khyber Medical University, Peshawar.
5. OSPEs will be conducted at the end of Mid-term & pre-prof Exam.

Feedback On Examination:

1. Students' feedback on assessment strategies will be taken in a preformed proforma for feedback twice a year i.e., Mid-term and pre-prof exams.
2. Feedback of theory as well as OSPE & Viva will be taken.
3. Department of Medical Education & Quality Enhancement Cell in collaboration with Exam Cell of WDC is responsible to conduct this exercise.

Model Questions:

Multiple Choice Question

1. The foramen magendi is located in:

a. Inferior horn of lateral ventricle
b. Posterior horn of lateral ventricle
c. Anterior horn of lateral ventricle
d. The roof of 3rd ventricle
e. 4th ventricle

2. A pregnant women took a drug during the fourth and fifth week of pregnancy and gave birth to a baby boy with meromelia. Which chemical agent she might have taken during pregnancy:

a. Aminopterin
b. Thalidomide
c. Phenytoin
d. Lithium
e. ACE inhibitors

3. The plane of reference which divides the body into right & left equal halves:

a. Parasagittal
b. Transverse
c. Transpyloric plane
d. Coronal plane
e. Sagittal plane

4. Salivary ducts are mostly lined by which epithelium:

a. Simple squamous epithelium
b. Simple cuboidal epithelium
c. Simple columnar epithelium
d. Stratified squamous epithelium
e. Transitional epithelium

SEQs:

Q1:What is deep cervical fascia? Breifly describe its modifications.

Deep Cervical Fascia:

The deep cervical fascia lies, as its name suggests, 'deep' to the superficial fascia and platysma muscle. This fascia is organised into several layers. These layers act like a shirt collar, supporting the structures and vessels of the neck thats why also known as FASCIA COLLI.

The layers of the deep cervical fascia (superficial to deep):

Investing Layer

The investing layer is the most superficial of the deep cervical fascia.
It surrounds all the structures in the neck. Where it meets
the trapezius and sternocleidomastoid muscles, it splits into two, completely surrounding them.

Pretracheal Layer

The pretracheal layer of fascia is situated in the anterior neck. It spans between the hyoid bone superiorly and the thorax inferiorly (where it fuses with
the pericardium).
The trachea, oesophagus, thyroid gland and infrahyoid muscles are enclosed by the pretracheal fascia.

Prevertebral Layer

The prevertebral fascia surrounds the vertebral column and its associated muscles; scalene muscles, prevertebral muscles, and the deep muscles of the back.

Carotid Sheath

The carotid sheaths are paired structures on either side of the neck, which enclose an important neurovascular bundle of the neck.
The contents of the carotid sheath are

- Common carotid artery
- Internal jugular vein.
- Vagus nerve.
- Accompanying cervical lymph nodes.

BUCCOPHYRANGEAL FASCIA

The posterior aspect of the visceral fascia is formed by contributions from
the buccopharyngeal fascia (a fascial covering of the pharynx).

Alar FASCIA

The alar fascia is a layer of fascia, sometimes described as part of the prevertebral fascia, and sometimes as in front of it.

Q2.A: Briefly explain day by day implantation status of human blastocyst during the second week of development?

Day 8: Partially Embedded

Day 9: Deeply Embedded in endometrium. Penetration defect closed by fibrin coagulum

Day 11 & 12: Completely embedded. Surface epithelium covers the original defect. Blastocysts produces slight protusion in to lumen .

Day13: Surface defect healed

B: Enlist sites of abnormal implantation?

- Abdominal cavity (1.4%):
- Ampullary region (80%):
- Tubal implantation (12%):
- Interstitial Implant (0.2%):
- Internal OS (0.2%):
- Rectouterine cavity pouch of douglas
- Any place covered by peritoneum
- Ovarian Implantation (0.2%):

1. Differentiate three major salivary glands on the basis of histology?

Ans: **Parotid gland:**

- Consist of only serous acini
- Intercalated ducts are long
- Connective tissue capsule is thick and well developed

Submandibular gland:

- Consist of both serous acini and mucous acini predominantly serous acini
- Some mucous acini bear caps of serous acini called serous demilunes
- Intercalated ducts are narrow and short
- Striated ducts are wider and longer,with distinct basal striation
- Connective tissue capsule is well developed

Sublingual gland:

- Both serous and mucous acini
- Consist of serous demilunes
- Both intercalated and striated ducts are short
- Capsule is thin and poorely developed

Suggestions For Next Academic Year:

1. Anatomy workshops can be planned once in a year to help students understand & comprehend the concept in better way.
2. Research program can be started in the department to facilitate students & faculty thus strengthening the foundation of research based learning from the start.

3. Basic histological technique including histological processing, sectioning & staining can be demonstrated live which would help students in their future research programs.

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