



**ALTAMASH INSTITUTE OF DENTAL MEDICINE
(JINNAH SINDH MEDICAL UNIVERSITY)**

**BDS First Year
Anatomy
Study Guide**

Introduction:

Anatomy is one of the essential basic science disciplines which dental students across Pakistan and outside study. This discipline helps students learn about the macro- and microscopic structures and developmental Anatomy with special emphasis on the head and neck region. There is also an introduction to other body systems in order to provide a more holistic view of the body to the learners.

Outcomes:

By the end of this course, students will be able to:

Identify and describe in detail the anatomical structures, histological features, neuro and development anatomy of the human body with related anomalies

Teaching and learning:

1. Flipped Classroom (FC)
2. Interactive lectures (IL)
3. Tutorials:
 - a) Case based learning (CBL)
 - b) Small group discussions (SGD)
4. Model Demonstration (Model Demo)

Assessment tools:

1. Multiple Choice Questions: (MCQSs)
 - One Correct Type
 - One Best Type
2. Observed structured practical examination (OSPE)



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s.n o.	Topic	Course Objectives: By the end of the course, 1 st year students will be able to:	Teaching method	Assessment Tool
GENERAL ANATOMY				
1	Introduction To Anatomy	<ul style="list-style-type: none"> • Define anatomy and its branches. • Discuss their practical implication. 	IL	MCQs
2	Terms Of Position And Movement:	<ul style="list-style-type: none"> • Define various planes, positions and terms of movement in relation to trunk, head & neck in particular. • Relate the movements with planes 	IL	MCQs
3	Cartilages	<ul style="list-style-type: none"> • Define cartilage • Classify on the basis of location, morphology and function. 	IL	MCQS
4	Bones	<ul style="list-style-type: none"> • Classify bone on the basis of shapes, development , structure & region) with examples • Compare parts of adult & young long bone • Summarize steps of bone development & ossification. 	IL	MCQS
5	Muscle	<ul style="list-style-type: none"> • Differentiate the 3 types of muscle. • Define: origin& insertion; fast & slow fiber and connective tissue coverings • Classify skeletal muscle on the basis of architecture with examples (from H&N preferably) 	IL	MCQS
6	Joints Of Body	<ul style="list-style-type: none"> • Define joint • Classify joint with examples on structural, regional & functional basis. • Outline features of synovial joints. 	CBL	MCQS
7	Introduction To Limbs	Identify the general arrangement of bones & muscles in the limb	Model demo	OSPE
8	General Organization Of Cvst	<ul style="list-style-type: none"> • Define the components of circulatory system. • Discuss the functional classification of vessels, types of circulation and anastomoses. 	IL	MCQS



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9	Lymphatic System	<ul style="list-style-type: none"> Define components of lymphatic system Describe origin and termination of large lymphatic channels. Discuss the role of lymphatics in the spread of infection & cancer 	IL	MCQS
10	Skin And Fascia	<ul style="list-style-type: none"> Define epidermal & dermal components. Differentiate tension, flexure & papillary ridges. Define superficial & deep fascia with examples. 	IL	MCQS
11	Nervous System	<ul style="list-style-type: none"> List the subdivisions (CNS, PNS, ANS) of nervous system & their component parts. Tabulate different cells types (neuron & neuroglia) and their function. Summarize formation of typical spinal nerve. Differentiate spinal and peripheral nerves. 	IL	MCQS
HISTOLOGY			Teaching method	Assessment Tool
1	Cell	<ul style="list-style-type: none"> Discuss histological aspects of cell components. Relate cell junctions with their location & function. Describe phases of cell cycle & steps of mitosis. 	IL	MCQS
2	Epithelial Tissue	<ul style="list-style-type: none"> Describe general features of epithelium. Classify epithelium with examples. Describe the specialization of each domain (surface modifications). Classify exocrine glands according to morphology; type & mode of secretion. 	IL	MCQS
3	Connective Tissue	<ul style="list-style-type: none"> Relate the general features of connective tissue with the functions. Describe the characteristic features, location and functions of its components (cell, matrix). Classify connective tissue with examples. Differentiate types of adipose tissue. 	IL	MCQS
4	Cartilages	<ul style="list-style-type: none"> Describe the components and coverings (perichondrium) . Differentiate the 3 types histologically. 	IL	MCQS
5	Bones	<ul style="list-style-type: none"> Discuss the types of cells & constituents of matrix (organic & inorganic) . 	FC	MCQS



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		<ul style="list-style-type: none"> Differentiate: Periosteum&endosteum; woven & lamellar bone; spongy & compact bone, with their localization in different bones. 		
6	Muscle	<ul style="list-style-type: none"> Briefly describe the structural & ultra-structural (T tubules, ER ,myofibril, myofilaments) organization of 3 types of muscle. Differentiate the 3 types of muscle histologically 	SGD	MCQS
7	Blood Vessels	<ul style="list-style-type: none"> Classify vascular system. Describe general structure of blood vessel. Compare the histological features of: arteries & veins; Elastic & muscular arteries & types of capillaries 	IL	MCQS
8	Lymphoid Tissue	<ul style="list-style-type: none"> Classify the types of immunity. Tabulate the lymphoid cells and their function. Describe the histological features of main lymphoid organs 	IL	MCQS
9	Skin	<ul style="list-style-type: none"> Differentiate thick & thin skin. Relate the function of each type of cell in epidermis. List the dermal appendages. Describe the glands of skin. 	FC	MCQS
10	Histology Of Oral Cavity	<ul style="list-style-type: none"> Describe the general features of oral mucosa in oral cavity. List the types of oral epithelium. Discuss the histology of lips, cheek, palate and gums. 	FC	MCQS
11	Histology Of Tongue	<ul style="list-style-type: none"> Describe the histological features of tongue: Mucosal papillae, taste buds, lingual salivary glands etc . 	IL	OSPE MCQS
12	Histology Of Salivary Glands	<ul style="list-style-type: none"> Describe in general the acini, duct system &stroma. Differentiate the 3 major glands histologically. 		
	EMBRYOLOGY		Teaching method	Assessment Tool
1	Introduction To Embryology	<ul style="list-style-type: none"> Define: Embryonic & Fetal period, Trimesters, Terms of position related to fetus and induction factors 	IL	MCQS



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2	Reproductive System Embryology	<ul style="list-style-type: none"> Identify the parts of male & female reproductive system. Discuss their contribution in gamete formation and transportation. 	MODEL DEMO IL	OSPE MCQS
3	Cell Division	<ul style="list-style-type: none"> List the types of cell division. Discuss steps of Meiosis 	SGD	MCQS
4	Meiosis And Gametogenesis	<ul style="list-style-type: none"> Relate meiosis with gamete formation 	IL	MCQS
5	Fertilization And Implantation	<ul style="list-style-type: none"> Discuss process of fertilization and events till implantation. Relate uterine changes in response to fertilization. 	CBL	MCQS
6	Development 2nd Weeks	<ul style="list-style-type: none"> Describe the formation of structures during 2nd week. 	IL	MCQS
7	Development 3rd Weeks	<ul style="list-style-type: none"> Describe gastrulation and Neurulation. Discuss the differentiation of mesoderm and somite formation. List derivatives of germ layers. 	IL	MCQS
8	Embryonic Period	<ul style="list-style-type: none"> List the week by week events during embryonic period. 	SGD	MCQS
9	Fetal Period	<ul style="list-style-type: none"> List the main events of fetal period during each month. 	FC	MCQS
10	Fetal Membranes And Placenta	<ul style="list-style-type: none"> List the fetal membranes Describe the maternal and fetal components of placenta. Describe briefly the amniotic fluid and its function. Describe the structure of placental barrier. 	IL	MCQS
11	Role Of Genes And Teratogens In Birth Defects	<ul style="list-style-type: none"> Discuss the role of genes & environmental factors in causation of congenital formation. List the teratogens producing facial, palatal & oral malformation. 	IL	MCQS
12	Antenatal Diagnostic	<ul style="list-style-type: none"> Discuss the most common antenatal diagnostic techniques : U/S , amniocentesis ,chorion villus 	IL	MCQS



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	Techniques	sampling		
13	Pharyngeal Apparatus	<ul style="list-style-type: none"> Define components of pharyngeal apparatus Describe derivatives of each component. Discuss the important anomalies 	IL	MCQS
14	Development Face	<ul style="list-style-type: none"> Describe formation of face from the prominences & its anomalies 	IL	MCQS
15	Development Of Tongue	<ul style="list-style-type: none"> Describe the development of the tongue & its anomalies. Describe how primary and secondary palate give rise to adult palate. Discuss embryologic basis of cleft palate & associated cleft lip. 	IL	MCQS
16	Development Of Salivary Glands	<ul style="list-style-type: none"> Discuss the derivation of secretory part, duct system and stroma from different embryonic sources. State their timeline 	IL	MCQS
17	Development Of Thyroid And Parathyroid Glands	<ul style="list-style-type: none"> Describe origin & derivation of both glands. Discuss the anomalies of thyroid gland 	IL	MCQS
NEUROANATOMY			Teaching method	Assessment Tool
1	Cranial Fossae	<ul style="list-style-type: none"> Identify the boundaries, bones and foramina of 3 cranial fossae. Relate the contents passing through the foramen. 	Model Demo	OSPE
2	Development Of Nervous System	<ul style="list-style-type: none"> Discuss differentiation of neural tube in brain vesicles. List the derivatives of brain vesicles Define Alar and Basal plates. 	SGD	MCQS



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3	Blood Supply Of Brain And Spinal Cord	<ul style="list-style-type: none"> • List the branches of internal carotid artery, vertebral artery & Basilar artery. • Describe location and formation of Circle of Willis. • Outline the course of internal carotid & vertebral arteries. • Demarcate the area of supply of the 3 cerebral arteries. • Describe the origin & area of supply of Spinal arteries. • Discuss the deficit caused by occlusion of cerebral arteries and spinal arteries. 	IL	MCQS
4	Meninges	<ul style="list-style-type: none"> • Describe the Dural folds and their function. • Define: Arachnoids Mater, sub arachnoid Space, arachnoid villi & granulations. • Describe Pia mater, its modification the denticulate ligament and its contribution to choroid plexus. • Discuss importance of epidural, subdural and subarachnoid spaces. 	IL	MCQS
5	Dural Venous Sinuses	<ul style="list-style-type: none"> • List Paired & Unpaired sinuses. • Discuss their association with dural folds and bones of cranial cavity. • Describe the location and contents of Cavernous sinus and its communication with veins of orbit & face. 	IL	MCQS
6	Ventricular System Of Brain	<ul style="list-style-type: none"> • Relate the parts of ventricular system with the lobes of brain. • Identify the openings /apertures of ventricular system • Define Choroid Plexuses • Describe boundaries of 4th ventricle & features related to the its floor • Discuss clinical correlation of CSF flow. 	Model Demo FC	MCQS OSPE
7	Cranial Nerves I-Xii	<ul style="list-style-type: none"> • Describe the origin, exit & functional components of nerves. 	IL	MCQS
8	Spinal Cord.	<ul style="list-style-type: none"> • Describe the gross appearance of Spinal cord. • State the location and function of Anterior & Posterior horns. 	IL SGD	MCQS MCQS



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9	Brain Stem,	<ul style="list-style-type: none"> Describe the location and division of brain stem. Describe the gross appearance of Medulla, Pons and Midbrain and emergence of cranial nerves. 	IL	MCQS
10	Cerebellum, Diencephalon	<ul style="list-style-type: none"> Describe the location and division of Diencephalon. List the 3 anatomical and functional lobes of cerebellum. 	IL SGD	MCQS MCQS
11	Cerebrum	<ul style="list-style-type: none"> Identify the main Sulci and Gyri; and functional cortical areas. Relate the function areas with their vascular supply. Define the types of white fibers. 	Model Demo IL	OSPE MCQS
12	Autonomic Nervous System	<ul style="list-style-type: none"> Classify Autonomic nervous system Differentiate the components of sympathetic & parasympathetic system and their function. 	IL	MCQS
13	Imaging Of Brain And Spinal Cord	Identify normal radiological anatomy of brain and spinal cord.	MODEL DEMO	OSPE
Head & Neck			Teaching method	Assessment Tool
1	Introduction Of Head And Neck Structure	Describe the topography of head and neck region.	IL	MCQS
2	The 4 Normas Of Skull	<ul style="list-style-type: none"> Identify the bones & anatomical features of 4 Normas'. Relate the foramina with their respective contents. 	MODEL DEMO	OSPE
3	Osteology Of The Mandible & Hyoid	<ul style="list-style-type: none"> Describe features and landmarks of mandible& Hyoid bones. Discuss age related changes in mandible. 	IL	MCQS
4	The Scalp	<ul style="list-style-type: none"> Discuss the associated clinical conditions associated with layers of scalp. Identify its neurovascular supply. 	SGD SGD	MCQS OSPE



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5	Face	<ul style="list-style-type: none"> Define its boundaries. Tabulate muscle & their actions. Describe neurovascular supply, lymphatics and their clinical aspects. 	IL	MCQS
6	Orbital Boundaries, Contents & Lacrimal Apparatus	<ul style="list-style-type: none"> Describe the bony boundaries. List the contents. Discuss the connections of Ciliary ganglion List components of lacrimal apparatus. Trace the pathway of lacrimation. 	IL	MCQS
7	Eye Ball& Extra-Ocular Muscles	<ul style="list-style-type: none"> Identify the 3 coats and the components of each coat. Identify the extra-ocular muscles. Discuss neurovascular supply & actions of these muscles. 	Model Demo Model Demo IL	OSPE OSPE MCQS
8	Ear	<ul style="list-style-type: none"> Describe the division of ear. Discuss the gross features & nerve supply of external ear. Identify the boundaries and relations of middle ear. List the contents of middle ear. 	IL Model Demo	MCQS OSPE
9	Temporal And Infratemporal Fossae	<ul style="list-style-type: none"> Identify the boundaries of temporal and infratemporal Fossa Describe the contents of infratemporal fossa. 	Model Demo IL	OSPE MCQS
10	Pterygopalatine Fossa	<ul style="list-style-type: none"> Discuss its boundaries & communications. Describe maxillary artery (3rd part) & maxillary nerve and connections of ganglion. 	IL	MCQS
11	Tmj And Muscles Of Mastication	<ul style="list-style-type: none"> Describe the Temporomandibular joint Describe the muscles of mastication, their neurovascular supply Discuss the movements and associated clinical conditions. 	IL	MCQS
12	Nose And Paranasal Sinuses	<ul style="list-style-type: none"> Describe the features of external nose, nasal cavity and the openings in meatus. Name the bones forming the nasal cavity & septum. Discuss the formation and clinical importance of 	IL	MCQS



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		<p>anastomoses at little's area.</p> <ul style="list-style-type: none"> List the paranasal sinuses & their location. Describe boundaries of maxillary sinus and its clinically important relation with maxillary teeth. 		
13	Oral Cavity	<ul style="list-style-type: none"> Discuss the boundaries & divisions of the oral cavity Describe the vestibule and oral cavity proper with their contents 	IL	MCQS
14	Hard & Soft Palate	<ul style="list-style-type: none"> Describe the boundaries. Tabulate the muscles, neurovascular supply and actions. Discuss the clinical (Gag reflex in dentistry) 	IL	MCQS
15	Tongue	<ul style="list-style-type: none"> Describe the division and external features of tongue. Tabulate the muscles, their action and nerve supply. Describe the vascular supply and lymphatic drainage Discuss the clinical correlation. 	IL	MCQS
16	Salivary Glands	<ul style="list-style-type: none"> Describe location, relations and neurovascular & lymphatic supply of these gland. List the structure passing through parotid gland. Discuss clinical correlations 	IL	MCQS
17	Cervical Vertebra	<ul style="list-style-type: none"> Describe the common features of cervical vertebra. Identify the typical & atypical vertebra by their relevant identifying features. 	IL Model Demo	MCQS OSPE
18	Skin, Fascia And Neck Muscles	<ul style="list-style-type: none"> Define the layers of neck. Describe the modifications of deep fascia. Describe contents of carotid sheath. 	IL	MCQS
19	Triangles Of Neck	<ul style="list-style-type: none"> Describe the boundaries of the triangles & their subdivision. list the component of each triangle. Describe cervical plexus. Discuss the clinical conditions related to them 	IL	MCQS
20	Pituitary Gland	<ul style="list-style-type: none"> Describe the location & division of gland. Differentiate the cells of pituitary according to staining. 	IL	MCQS



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		<ul style="list-style-type: none"> List the 2 sources from which the adenohypophysis and neurohypophysis develops. 		
21	Thyroid And Parathyroid Glands	<ul style="list-style-type: none"> Describe the location, extent, relation and vascular supply of both glands and clinical related to it. 	FC	MCQS
22	Gross Anatomy Of Pharynx	<ul style="list-style-type: none"> Describe the location, extent & divisions of pharynx. Identify features related to each part (tonsils, Pharyngotympanic tube Ostia etc.). 	IL Model Demo	MCQS OSPE
23	Gross Anatomy Of Larynx	<ul style="list-style-type: none"> Describe its extent & location. List the cartilages & membranes of larynx. Tabulate the muscles their nerve supply & actions. Discuss the clinical conditions related to the innervation. 	IL	MCQS
24	Cranial Nerves V, VII, IX, X, XI & XII	<ul style="list-style-type: none"> Describe the brief course of each nerve. major vessels of neck Tabulate their branches & area of supply. Discuss the impact of injury. Describe the origin and course of major arteries briefly in neck. List their branches in neck. 	IL	MCQS
25	Lymphatic Drainage	<ul style="list-style-type: none"> Describe the lymphatic drainage of head and neck. Discuss its clinical significance in relation to oral structures. 	IL	MCQS
26	Introduction To Thoracic Cavity	<ul style="list-style-type: none"> State boundaries of thoracic cavity. Identify the contents of thorax at their respective position. 	SGD	MCQS
27	Introduction To Abdominal Cavity	Identify abdominal viscera in relation to regions and quadrants	MODEL DEMO	OSPE
Practical's By the end of the session students will be able to:			Teaching method	Assessment Tool
1	Microscopy	Identify different parts of microscope along with their function.	Model Demo	OSPE



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		Demonstrate operational steps of microscope handling.		
2	Cell	Identify different component in various cells, visualized under light microscope.		
3	Epithelium	Differentiate different types of epithelia according to their characteristic identification		
4	Connective Tissue	Identify different varieties of connective tissue proper at different sites		
5	Bone	Differentiate the light microscopic features of compact and spongy bone.		
6	Cartilage	Identify the 3 types of cartilage on the basis of their characteristic features.		
7	Muscle	Differentiate the three basic muscle types according to their histological features		
8	Skin	Identify the layers of epidermis and the dermal appendages.		
9	Lymphoid Organs	Differentiate the histological features of major lymphoid organs		
10	Blood Vessels	Identify the basic layers of blood vessels. Differentiate artery from vein.	Model Demo	OSPE
11	Histology Of Tongue	Identify the characteristic identification features of tongue .		
12	Histology Of Salivary Glands	Differentiate the 3 major salivary gland on the basis of mucous and serous acini.		
13	Thyroid And Parathyroid Glands	Identify the follicular arrangement and follicular cells in thyroid gland. Identify the anastomosing cord and chief and oxyphil cells in Parathyroid gland.		



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Reading Sources:

Text Books:

- Gray's Anatomy for Students Book by Adam W. M. Mitchell, Richard L. Drake, and Wayne Vogl
- Langman's Medical Embryology 14th Edition
- Wheater's Functional Histology: A Text and Colour Atlas (FUNCTIONAL HISTOLOGY (WHEATER'S)) 6th Edition
- Snell's Clinical Neuroanatomy - Wolters Kluwer

Practical Lab:

Anatomy museum: It plays a major role in teaching curriculum by contributing to the field of research and education from time immemorial, by understanding the various aspects of Human Anatomy. It allows a first-hand visual impression to the student

Histology Practical lab: It is essential for students as it helps students understand the arrangement of cells and tissues in a normal organ system on histological slides. Also, it correlates the structure to function by correlating the differentiation of tissue structure to their specific function.

Internet resources: With easy excess to digital library students will use internet resources with added time flexibility to enrich and update their knowledge and its application.

Library: It provides wealth of resources, space to study alone or in a group. It also provide world of books to discover and borrow.

Assessment Criteria :

Knowledge:

- MCQs (Multiple Choice Questions) are used to assess objectives covered in each module.
- A MCQ has a statement or clinical scenario followed by four options (likely answer).
- Students after reading the statement/scenario select ONE, the most appropriate response from the given list of options.
- Correct answer carries one mark, and incorrect 'zero mark'. There is no negative marking.
- Students mark their responses on an answer sheet provided by examination department.



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Skills:

- OSPE: Objective Structured Practical Examination:
- Each student will be assessed on the same content and have same time to complete the task.
- Comprise of 12-25 stations.
- Each station may assess a practical tasks include practical skills and application of knowledge
- Stations are observed, interactive, application of knowledge based and rest.
- In Observed and Interactive Stations these will be assessed by internal or external examiners through structured viva or a task.
- Application of knowledge Stations: it will be static stations in which there will be pictures, clinical scenarios with related questions for students to answer on the provided answer copy.
- Rests: It is a station where there is no task given and in this time student can organize his/her thoughts.

AIDM Internal Assessment Policy

Students will be assessed to determine achievement of learning objectives through the following:

- Midterm Examination will be scheduled on completion of half of the course
- Mock Examination will be scheduled on completion of whole course
- The method of examination comprises theory exam which includes MCQs, and practical examination by OSPE (Objective Structured Practical Examination).
- Student's behaviors and attitudes will be observed during all academic activities.

Annual Examination:

- Marks of both internal assessments will constitute 20% weightage as per JSMU policy.
- University Annual examination will be based on MCQs and OSPE.

Attempts:

There are 2 attempts in the third professional examination only. 2nd attempt is the supplementary examination which if not passed student has to repeat the year.

Course Evaluation:



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- Pass/fail ratio of continuous and summative assessments will be evaluated.
- 75% attendance is mandatory to be eligible for annual professional examination
- Feedback will be taken
 - Regarding course from students and faculty
 - Student feedback regarding faculty
 - Faculty feedback of students

Course Faculty:

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