



FIRST YEAR BDS ANATOMY STUDY GUIDE 2021-2022

*Updated on 13 January
2022*

Introduction to Anatomy

Department Vision:

To train undergraduate students by qualified faculty and state of the art infrastructure and technology so that students can meet the community challenges of 21st century infrastructure.

Department Mission:

To impart core knowledge of anatomy in interesting, compact and practical way to undergraduate students by Hybrid/Spiral integrated system of teaching so that they can differentiate between normal and abnormal structure at gross, microscopic and embryological level. The objectives are achieved through knowledge of Anatomy on principles of pedagogy. Skills are developed by dissection and prosection, simulation – models, cyber teaching, surface anatomy, modern histological techniques. Attitudes are developed by employing communication skills, lecture and presentations, self-directed learning, RBL museum Atlas, integrated journal, cyber teaching, e-learning, quest for research, journal club meetings, library, professionalism, empathy, inter-personal skills, and extra-curricular activities.

Resources

- A. Teaching resources
- B. Supporting staff
- C. Infrastructure resources

Teaching Resources Faculty Members

Department of Anatomy Involved in BDS Teaching			
1	Dr. Ansa Rabia	Professor & Head of Department	MBBS; M.Phil
2	Dr. Faiza Shafqat	Demonstrator	MBBS
3	Dr. Bismah Riaz	Demonstrator	MBBS

Supporting Staff

Sr No	Supporting staff	Number
1	Lab assistant	2
2	Lab technologist	1
3	Computer operator	1
4	Dissection hall attendant	4
5	Curator	1
6	Embalmer	1
7	Runner	1

Infrastructure Resources

Sr. #.	Infrastructure Resources	Quantity
1	Lecture hall <ul style="list-style-type: none">• Seating Capacity 140• Multimedia• Microphone• Computer system• White board	1
2	Small group discussion rooms	5
2	Histology Lab <ul style="list-style-type: none">• Microscopes• Histological slides	1
3	Museum <ul style="list-style-type: none">• Study models• Atlas	1
4	Dissection Hall	1
5	Mini library	1

Teaching and Learning Strategies

Multiple educational methods will be used comprising of self-study, interactive lectures, group discussions, practical, and manual dexterity skill sessions.

(i) Methods for achieving cognitive objectives

- Interactive lectures using audio visual aids on power point presentation
- Group discussions in form of large group and small group
- Collaborative learning
- Self-study and reading from learning resources

(ii) Methods for achieving psychomotor objectives

- Focusing the histological slides on microscope
- Identification of normal histological structures on slides under different magnifications
- Drawing and labeling the histological slides on practical notebooks

(iii) Methods for achieving affective objectives

- Interaction with peers, group members, teachers, support staff etc.
- Group discussions (small and large)

Learning Methodologies

The following teaching/ learning methods are used to promote better understanding:

- Interactive lectures
- Small group discussions
- Large group discussions
- Demonstrations
- Dissections / Prosection (Skill sessions)
- Self-directed learning
- Practical
- Histology journal
- Study models

Curriculum Implementation

Curriculum implementation refers to putting into practice the official document including course content, objectives, learning and teaching strategies. Implementation process helps the learner to achieve knowledge, skills and attitudes required of the learning tasks. Learners are a pertinent component of the implementation process. Implementation occurs when the learner achieves the intended learning experiences, knowledge, ideas, skills and attitudes which are aimed to make the learner an effective part of the society. Curriculum implementation also refers to the stage at which curriculum is put into effect. There has to be an implementing agent as well. Teacher is an important part of this process and implementation of the curriculum is the way the teacher selects and utilizes various components of the curriculum. Implementation occurs when the teacher's formulated course content, teacher's personality and teaching and learning environment interact with the learners. Therefore, curriculum implementation is how the officially planned course of study is translated and reflected by the teacher into schemes of work, lesson plans, syllabus and resources are effectively transferred to the learners. Curriculum implementation can be affected by certain factors such as teachers, learners, learning environment, resource materials and facilities, culture and ideology, instructional supervision and assessments.

Personnel involved in teaching and facilitation

(i) Lectures delivery by: Dr. Ansa Rabia (Professor & Head of department), Prof. Dr. Uzma Naseer, Dr Shaista Arshad (Associate Prof.), Dr. Tayyaba Mahmud (Assistant Prof.), Dr. Saadia Hafeez (Assistant Prof.)

(ii) Demonstrators and facilitators for practical, dissection and small group discussion sessions:

Dr. Faiza Shafqat, Dr. Bismah Riaz, Dr. Yumna Mazafar, Dr. Zimal Saad

(iii) Support staff: Lab assistants, lab technologist, computer operator, dissection hall attendants, curator, embalmer, runner

Time Frame

Course duration: 36 weeks

Lectures: Monday (9:50 to 10:45 am), Tuesday (8:00 to 8:55am), Thursday (8:00 to 8:55 am)

Tutorial/ Lecture (SGD): Tuesday (9:50 to 10:45 am) alternate week

Dissection: Monday (11:15 am to 01:05 pm), Tuesday (1:05 to 3:00 pm), Wednesday & Thursday (8:55 to 10:45 am)

Practical: Wednesday (11:15am to 1:05 pm), Thursday (1:05 to 3:00 pm), Friday (11:00 am to 01:00 pm)

Course Outline

Term	Subject	Teaching & Learning	Evaluation
Block - I	Gross Anatomy	Neck region	One Substage EOB-I Exam
	Embryology	Gametogenesis Week 1-3 of development	EOB – I Exam
	Histology	Cell Epithelium	EOB – I Exam
	General Anatomy	Introduction Osteology Myology Nervous system-1 Circulatory system	EOB – I Exam
Block - II	Gross Anatomy	Head Region	2 Substages EOB – II Exam
	Embryology	Embryonic period (3-8 weeks) Development of Skull Development of Head & Neck Birth defects	EOB – II Exam
	Histology	Connective Tissue Bone Cartilage Muscle Digestive System (Lip, Tongue, Salivary glands)	EOB – II Exam
Block - III	Gross Anatomy	Brain & Neuro Anatomy	2 Substages EOB – III Exam
	Embryology	Development of CNS CNS	EOB – III Exam
	Histology	Lymphoid System	EOB – III Exam
	General Anatomy	Skin & fascia Arthrology Nervous System-2	EOB – III Exam

Table of Specification for Teaching and Learning Objectives

ANATOMY BLOCK-1 (10 WEEKS)

Course outline

General Anatomy <small>OSPE/ V VOCE</small>	Histology	Embryology	Gross Anatomy
Introduction	Cell	Gametogenesis	Neck 7
Osteology	Epithelium	1-3 Weeks	
Myology			
Nervous system-1			
Circulatory system			

Course content

GENERAL ANATOMY

S.No	Topic/ Theme	Learning outcomes	Learning objectives/ contents	Instructional strategies	Assessment tool
1.	Introduction to Anatomy	Identify the anatomical terms, plans, movements & study techniques in anatomy	<p>Students should be able to:</p> <ol style="list-style-type: none"> Define different disciplines of Anatomy Identify terms of position in relation to anatomical position: <ul style="list-style-type: none"> ○ Anterior / Posterior ○ Ventral / Dorsal ○ Superior / Inferior ○ Caudal / Rostral / Cranial ○ Medial / Lateral ○ Proximal / Distal ○ Palmar / plantar ○ Superficial /Deep ○ Supine / Prone Demonstrate the normal anatomical position Identify the following anatomical planes with the help of diagrams. <ul style="list-style-type: none"> ○ Coronal ○ Sagittal ○ Horizontal ○ Parasagittal Identify the terms of movements with general reference to the axis and 	LGIS (Large group interactive session)	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

			<p>planes in which they occur and demonstrate each on subject.</p> <ul style="list-style-type: none"> ○ Flexion / Extension ○ Abduction / Adduction ○ Lateral rotation / Medial rotation ○ Pronation / Supination ○ Plantar flexion / Dorsal flexion ○ Circumduction ○ Eversion / Inversion <p>6. Identify the various techniques to study anatomy in the living such as:</p> <ul style="list-style-type: none"> ○ Plain radiographs 		
2.	Osteology	Summarize the general features of bones	<ol style="list-style-type: none"> 1. Identify the axial and appendicular parts of a human skeleton. 2. Classify bones according to their development and shape giving examples of each type especially from head and neck (wherever possible). 3. Describe the process of both types of ossification 4. Describe blood supply of the long & diploic bones. 	LGIS	MCQs/ SEQs/ SAQs/ VIVA OSPE/ VOCE
3.	Myology	Appraise the general anatomical features of muscles	<ul style="list-style-type: none"> <input type="checkbox"/> Classify muscles into three basic types <input type="checkbox"/> Correlate skeletal muscles according to their shape, Muscle fiber types and functions with examples of each type 	LGIS	MCQs/ SEQs/ SAQs/ VIVA OSPE/ VOCE
4.	Nervous system I	Correlate the general anatomical structure of different parts of nervous system, with its	<ol style="list-style-type: none"> 1. Appraise general concept of nervous system. <ul style="list-style-type: none"> <input type="checkbox"/> Nervous Tissue <input type="checkbox"/> Receptors <input type="checkbox"/> Nerve fiber <input type="checkbox"/> Neuroglia 2. Identify the parts of the nervous system 	LGIS	MCQs/ SEQs/ SAQs/ VIVA OSPE/ VOCE

		functional significance	contributing in formation of central and peripheral nervous system 3. Describe the formation, course and distribution of a typical spinal nerve		
5.	Circulatory system	Summarize the general anatomical features of circulatory system	1. Justify general plan of systemic, portal and lymphatic circulatory system. 2. Compare blood vessels according to their sizes and functions with examples of each type. 3. Describe various types of anastomosis with example and their clinical significance.	LGIS	MCQs/ SEQs/ SAQs/ VIVA OSPE/ VOCE

GENERAL HISTOLOGY

1.	Cell/Cell junctions	Appraise the light microscopic structure of the cells	<p>KNOWLEDGE</p> <ol style="list-style-type: none"> 1. Introduction to histology, microscope 2. Differentiate between acidophilia and basophilia. 3. Enumerate different cell organelles and identify staining reaction of each. 4. Illustrate shapes of different cells with example 5. Enumerate different components of the cytoskeleton. 6. Correlate the structure of different type of intercellular junctions with their functions. <p>SKILL</p> <ol style="list-style-type: none"> 1. Focus the prepared slide at different magnifications. 2. Draw the labelled diagram of cells having various shapes. 	LGIS	MCQs/ SEQs/ SAQs/ VIVA OSPE/ VOCE
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2.	Epithelium	Appraise the light microscopic structure of epithelial tissue	<p>KNOWLEDGE</p> <ol style="list-style-type: none"> 1. Define epithelium 2. Compare surface epithelium with examples of each type. 3. Classify glandular epithelium with examples of each type. 4. Compare the ultrastructure of microvilli, stereocilia and cilia and correlate with their roles in various cellular functions 5. Classify glands according to their morphology, secretory products and mode of secretion with examples of each type <p>SKILL</p> <ol style="list-style-type: none"> 1. Identify different types of epithelia under light microscope and enlist at least two identification points for each type. 2. Draw labelled diagrams of each type of epithelium. 3. Compare and contrast between the histological structure of serous and mucous secreting cells. 4. Draw labelled diagram of mucous and serous acini 	<p>LGIS</p> <p>Lab</p>	<p>MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE</p>
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GENERAL EMBRYOLOGY

1.	Gametogenesis & Transport of ovum & Fertilization	Elaborate the development of germ cells	<ol style="list-style-type: none"> 1. Revisit cell division, mitosis & meiosis 2. Describe the events of spermatogenesis 3. Describe the events of spermiogenesis 4. Describe the relation of ovarian cycle with maturation of follicles. 5. Describe the stages of follicular maturation 	<p>LGIS</p>	<p>MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE</p>
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			<input type="checkbox"/> Primary <input type="checkbox"/> Preantral <input type="checkbox"/> Secondary <input type="checkbox"/> Preovulatory. 6. Describe the process of ovulation and correlate its timing with ovarian cycle. 7. Define fertilization 8. State normal site of fertilization 9. Describe the results of fertilization 10. Enlist the factors affecting fertilization 11. Enumerate the changes that occur in spermatozoa before fertilization 12. Explain the factors affecting penetration of sperm through the zona pellucida for formation of Pro-nuclei		
2.	1st week of development	Appraise the early weeks of development of embryo	1. Appraise the implantation and its normal site 2. Describe the changes in uterus at time of implantation. 3. Explain the process of cleavage 4. Explain the formation of morula and blastula 5. Describe the formation of inner and outer cell mass within the blastocyst cavity 6. Appraise abnormal sites for implantation (ectopic pregnancy) and its clinical significance.	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
3.	2nd week of development	Anatomize the early weeks of development of embryo	1. Discuss the formation of bilaminar embryonic disc from embryoblast. 2. Describe early differentiation of trophoblast	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

			<ol style="list-style-type: none"> 3. Explain the formation of amniotic cavity 4. Explain the formation of chorion, secondary yolk sac and chorionic plate. 5. Explain the establishment of uteroplacental circulation. 6. Appraise 2nd week as week of twos. 		
4.	3rd week of development	Anatomize the early weeks of development of embryo	<ol style="list-style-type: none"> 1. Define gastrulation (formation of three germ layers) 2. Discuss the development, significance and fate of primitive streak 3. Describe the development of notochordal process, notochord canal, prechordal plate and cloacal membrane 4. Compare the topographic arrangement and derivatives of three components of intraembryonic Mesoderm (Paraxial, Intermediate and Lateral Plate Mesoderm) 5. Describe early development of CVS. 6. Describe differentiation of trophoblast during third week and formation of primary, secondary and tertiary chorionic villi 7. Enumerate the parts of placenta Explain formation and fate of allantois. 	LGIS	MCQs/ SEQs/ SAQs/ VIVA OSPE/ VOCE
GROSS ANATOMY (NECK)					
1.	Cervical vertebrae	Differentiate typical and	<input type="checkbox"/> Give distinguishing features of each cervical vertebra.	SGD and dissection	MCQs/ SEQs/ SAQs/

		atypical cervical vertebrae	<input type="checkbox"/> Enumerate structures passing through foramina <input type="checkbox"/> Outline ligamentous attachments on cervical vertebrae.		OSPE/ VOCE	VIVA
2.	Deep Cervical Fascia	<input type="checkbox"/> Anatomize the four layers of deep cervical fascia in detail. Correlate the topography of cervical fascial spaces to mediastinal and contralateral spread of infection.	<input type="checkbox"/> Enumerate the layers of deep cervical fascia. <input type="checkbox"/> Trace the attachments of investing, pre-tracheal, carotid sheath and prevertebral layers of fascia. <input type="checkbox"/> Identify various modifications and neck spaces formed by fascial attachments. <input type="checkbox"/> Comprehend the clinical importance of neck spaces in spread of infection	SGD and dissection	MCQs/ SAQs/ OSPE/ VOCE	SEQs/ VIVA
3.	Muscles of Neck	Describe the origin, insertion, movements and nerve supply of the muscles present in neck	1. Describe the muscles of neck (sternocleidomastoid, trapezius and infrahyoid muscles) along with their nerve supply with the help of models. 2. Enlist the features of Torticollis	SGD and dissection	MCQs/ SAQs/ OSPE/ VOCE	SEQs/ VIVA
4.	Triangles of Neck	Link the anatomical location of triangles of neck and their contents with their clinical significance.	<input type="checkbox"/> Tabulate the attachments, nerve supply, actions of superficial and deep muscles of neck (sternocleidomastoid, suprahyoid, infrahyoid, sub occipital, prevertebral muscles) <input type="checkbox"/> Identify boundaries and contents of triangles of neck on model <input type="checkbox"/> Describe the origin, course and distribution of nerves of neck (cervical plexus, Ansa cervicalis, Common carotid artery, Internal	SGD and dissection	MCQs/ SAQs/ OSPE/ VOCE	SEQs/ VIVA

			jugular vein, subclavian vessels)		
5.	Vessels of Neck	Correlate the anatomy of each vessel with its area of supply and drainage	<ol style="list-style-type: none"> 1. Enumerate the main vessels in neck. 2. Describe the course and branches of <ul style="list-style-type: none"> ○ External carotid artery ○ Subclavian artery ○ External jugular vein ○ Internal jugular vein. 	SGD and dissection	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
6.	Nerves of Neck	Correlate the anatomy and distribution of cranial nerves with lesions associated with their injuries	<ol style="list-style-type: none"> 1. Enumerate the main cranial nerves supplying in neck 2. Trace the distribution of cranial nerves 3. Enumerate branches of each of the above nerve and identify their area of supply. 	SGD and dissection	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
7.	Lymphatic Drainage of Neck	Appraise the lymphatic drainage of neck with understanding of relevant clinical conditions on anatomical basis.	<ol style="list-style-type: none"> 1. Enlist the groups of lymph nodes of neck. 2. Describe their location and areas of drainage 3. Appraise the formation of jugular lymph trunk 4. Correlate the clinical importance of lymphatic drainage of neck 	SGD and dissection	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
8.	Viscera of neck	Correlate the anatomy of viscera's present in neck with their relevant clinical significance.	<ol style="list-style-type: none"> 1. Appraise the relations of trachea and esophagus in neck region with the help of dissection 2. Describe the structures involved in cricothyroidotomy and Tracheostomy with the help of dissection. 	SGD, dissection and skills lab	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
9.	Thyroid and parathyroid gland	Correlate the gross anatomy of thyroid and parathyroid glands with relevant clinical conditions	<ul style="list-style-type: none"> □ Identify gross features of thyroid and parathyroid glands on models. □ Describe capsule, relations and blood supply of thyroid and parathyroid gland 	SGD and dissection	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

			<input type="checkbox"/> Justify anatomical basis of movement of thyroid gland during deglutition <input type="checkbox"/> Discuss surgical precautions in thyroid surgery while ligating vessels and enucleation		
10.	Prevertebral region and root of neck	Describe skin, superficial fascia, and cutaneous nerves of the prevertebral region along with the action and nerve supply of muscles present here.	<ol style="list-style-type: none"> 1. Enumerate the prevertebral muscles 2. Describe origin, insertion, action and nerve supply of prevertebral muscles 3. Identify the boundaries of pyramidal space. 4. Describe the peculiar arrangement of prevertebral fascia in prevertebral region and justify formation of axillary sheath around axillary artery and brachial plexus but not axillary vein. 5. Anatomize the relations of key muscle of root of neck (scalenus anterior) 6. Describe the parts and branches of subclavian artery. 	SGD and dissection	MCQs/ SEQs/ SAQs/ VIVA OSPE/ VOCE
11.	Larynx	Correlate the gross anatomy of larynx with relevant clinical conditions	<input type="checkbox"/> Describe laryngeal wall in detail with emphasis on cartilages, ligaments, muscles, vascular supply and nerve supply. <input type="checkbox"/> Analyze mechanism of abduction and adduction of vocal cords <input type="checkbox"/> Distinguish clinical presentations of injury to external, internal and recurrent laryngeal nerves.	SGD and dissection	MCQs/ SEQs/ SAQs/ VIVA OSPE/ VOCE
12.	Joints of neck	Correlate the gross anatomical features of joints	<ol style="list-style-type: none"> 1. Name the typical and atypical intervertebral joints of neck. 	SGD and dissection	MCQs/ SEQs/ SAQs/

		of neck with their clinical significance	<ol style="list-style-type: none"> Identify the types of atlanto-occipital and atlanto-axial joints. Describe the movements of these joints with muscles producing them. 		OSPE/ VOCE	VIVA
13.	Back of neck	Link the anatomical location and contents of triangles present at the back of neck with their clinical significance	<ol style="list-style-type: none"> Enumerate the muscles of back of neck. Identify the boundaries and contents of suboccipital triangle. Describe the course and relations of 3rd and 4th parts of vertebral arteries. 	SGD and dissection	MCQs/ SAQs/ OSPE/ VOCE	SEQs/ VIVA

List of Histology practicals

Sr No.	Topics
At the end of these practicals, students will be able to identify/ illustrate following:	
1.	Cell
2.	Epithelium

			regular, irregular and adipose connective tissue		
2.	Bone	Appraise the light microscopic structure of bone	<p>KNOWLEDGE</p> <ol style="list-style-type: none"> 1. Compare microscopic structure of compact and cancellous bone. 2. Correlate the process of bone remodelling with tooth bracing and adjustment. <p>SKILL</p> <ol style="list-style-type: none"> 1. Identify the slides of cancellous and compact bone under light microscope and list at least two identification points of each type. 2. Draw labelled diagrams showing light microscopic structure of cancellous and compact bones. 	LGIS Lab	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
3.	Cartilage	Appraise the light microscopic structure of cartilage	<p>KNOWLEDGE</p> <p>Differentiate microscopic features of various types of cartilages with examples</p> <p>SKILL</p> <ol style="list-style-type: none"> 1. Identify the slides of hyaline, elastic and fibro cartilage under light microscope and list at least two identification points of each type. 2. Draw labelled diagrams showing light microscopic structure of hyaline, elastic and fibro cartilage. 	LGIS Lab	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
4.	Muscle	Appraise the light microscopic structure of muscle	<p>KNOWLEDGE</p> <ol style="list-style-type: none"> 1. Differentiate the microscopic features skeletal, smooth and cardiac muscle while correlating with their functions. 2. Explain the histological 	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

			<p>differences of different types of muscles.</p> <p>SKILL</p> <ol style="list-style-type: none"> 1. Identify microscopic sections of different types of muscle under light microscope and list at least two identification points of each type 2. Draw labelled diagrams showing light microscopic structure of different types of muscles. 	Lab	
5.	Oral cavity (Lip, Tongue, Salivary glands)	<p>Appraise the light microscopic structure of lip and tongue, with special emphasis on papillae of tongue and taste buds.</p> <p>Appraise the light microscopic structure of major salivary glands.</p>	<p>KNOWLEDGE</p> <ol style="list-style-type: none"> 1. Explain the histological structure of lip. 2. Describe the microscopic structure of tongue, with special reference to epithelium on its two surfaces, types of lingual papillae and taste buds with their location and structure 3. Describe the Histological features of parotid, submandibular and sublingual glands with reference to their type, parenchyma, stroma and duct system. <p>SKILL</p> <ol style="list-style-type: none"> 1. Identify microscopic sections of lip, tongue, submandibular, sublingual and parotid glands under light microscope and enlist at least two identification points of each. 2. Draw labelled diagrams showing light microscopic structure of lip, tongue, submandibular, sublingual and parotid glands. 	<p>LGIS</p> <p>Lab</p>	<p>MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE</p>

SPECIAL EMBRYOLOGY

S.No	Topic/ Theme	Learning outcomes	Learning Objectives/Contents	Instructional strategies	Assessment tool
1	<p>The embryonic period; 3rd to 8th week</p> <p>Birth defects & prenatal diagnosis</p>	Explain the early weeks of development of embryo	<ol style="list-style-type: none"> 1. Define neurulation. 2. Describe process of formation of neural plate, neural tube and neural crest cells. 3. List derivatives of: <ol style="list-style-type: none"> a. Surface ectoderm b. Neurectoderm c. Neural crest d. Intraembryonic mesoderm (paraxial, intermediate, lateral plate) e. Endoderm 4. Describe early differentiation of somites 5. Describe the development of intraembryonic coelom. 6. Describe the folding of the embryo in the median plane and correlate it with its consequences 7. Describe the folding of the embryo in the horizontal plane and correlate it with its consequences 8. Describe relocation of connecting stalk to the anterior abdominal wall and its differentiation into umbilical cord. <p>Skills Identify the structures related to general development on given models of general embryology</p>	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
2	Musculo-Skeletal System (skull, Face, thyroid gland,)	Comprehend the embryological basis behind the	<ol style="list-style-type: none"> 1. Identify the sources of skull 2. Classify Skull on embryological basis 3. Describe the events in 	LGIS	MCQs/ SEQs/ SAQs/

		development of skull, face and thyroid gland correlate them with various relevant clinical presentations.	development of cartilaginous and membranous neurocranium 4. Outline features of a newborn skull 5. Identify the fontanelles with reference to their location, closing time and clinical significance 6. Explain the embryological basis of acrania, microcephaly and various types of craniosynostosis.		OSPE/ VIVA VOCE
3	Head	Comprehend the embryological basis of congenital anomalies related to Pharyngeal Arches and pouches, tongue, nose and paranasal sinuses, face, palate thyroid and parathyroid glands	1. Define pharyngeal arch, pharyngeal groove, pharyngeal cleft and pharyngeal membrane 2. Enlist the derivatives of pharyngeal arches pharyngeal grooves, pharyngeal clefts and pharyngeal membranes. 3. Discuss the development of face with special reference to role of neural crest cells. 4. Describe the development of nasal cavities and paranasal sinuses 5. Justify the association of craniofacial anomalies with other anomalies caused by improper migration of neural crest cells. 6. Discuss development of thyroid gland and correlate it with ectopic thyroid tissue. 7. Discuss development of parathyroid glands. 8. Discuss the descent of thyroid and parathyroid glands to their definitive positions. 9. Justify the definitive positioning of parathyroid	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

			gland arising from third arch lower than the one arising from fourth arch		
GROSS ANATOMY HEAD					
S.No	Topic/ Theme	Learning outcomes	Learning Objectives/Contents	Instructional strategies	Assessment tool
1	Skull	Elucidate the topographic anatomy of skull	<ul style="list-style-type: none"> <input type="checkbox"/> Appreciate the general plan of studying skull from different views. <input type="checkbox"/> Identify important bony landmarks on the bones as viewed from lateral, superior, inferior, anterior and posterior views. <input type="checkbox"/> List structures traversing the foramina in these bones <input type="checkbox"/> Identify the bones forming the boundaries of orbit, nasal cavity, oral cavity, temporal, infratemporal fossa & pterygopalatine fossa on the given bone. (detail to be done with relevant topics) 	SGD (Small Group Discussion)	MCQ/ SAQ/OSPE Viva
2	Scalp	Correlate the structure and neurovascular supply of scalp with anatomical basis of relevant clinical conditions.	<ul style="list-style-type: none"> <input type="checkbox"/> Appraise extent of scalp on model <input type="checkbox"/> Enumerate layers of scalp in a sequential order <p>Correlate gross features of each layer with anatomical basis of black eye, profuse bleeding, gaping wound, spread of scalp infection and shape of hematoma.</p>	SGD and dissection	MCQ/ SAQ/OSPE Viva
3	Oral cavity	Correlate the gross anatomy of oral cavity and tongue with anatomical basis of relevant clinical conditions	<ol style="list-style-type: none"> 1. Name different boundaries of oral cavity. 2. Describe blood and nerve supply and lymphatic drainage of oral cavity. 3. Identify the location of inferior alveolar nerve block 4. Describe the salient features of floor of mouth. 	SGD and dissection	MCQ/ SAQ/OSPE Viva

			<p>5. Discuss the attachments, actions, nerve supply and relations of suprahyoid muscles</p> <p>6. Identify parts of tongue</p> <p>7. Identify the gross features of dorsal and ventral surfaces of tongue</p> <p>8. Name the intrinsic and extrinsic muscles of tongue. 9. Describe attachments, actions and nerve supply of muscles of tongue</p> <p>Describe the motor, general and special sensory innervation of tongue</p>		
4	Face	Correlate the gross anatomy of face with anatomical basis of relevant clinical conditions.	<ul style="list-style-type: none"> <input type="checkbox"/> Outline the characteristic features of facial skin. <input type="checkbox"/> Elucidate the cutaneous innervation of face <input type="checkbox"/> Group facial muscles according to the orifices they are guarding <input type="checkbox"/> Describe the nerve supply of muscles of facial expressions. <input type="checkbox"/> Describe the course of arteries, veins, lymphatics and nerves of the face with the help of model. <input type="checkbox"/> Correlate gross features of face with anatomical basis of danger area, trigeminal neuralgia, Bell's palsy. <p>Skill:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Identify muscles of facial expressions <input type="checkbox"/> Illustrate the cutaneous innervation of face 	SGD and dissection	MCQ/ SAQ/OSPE Viva
5	Mandibular and maxillary branches Of Trigeminal Nerve	Correlate the anatomy of mandibular and maxillary divisions of	<p>1. Describe the pathway of mandibular nerve from nucleus to target organs</p>	SGD and dissection	MCQ/ SAQ/OSPE Viva

		Trigeminal nerve with their lesions	<ol style="list-style-type: none"> 2. Describe the pathway of maxillary nerve from nucleus to target organs 3. Describe the lesions of nerves with special reference to infections of molar teeth 		
6	Facial Nerve	Correlate the anatomy of facial nerve with its lesions	<ul style="list-style-type: none"> <input type="checkbox"/> Revisit the course and distribution of facial nerve <input type="checkbox"/> Revisit the relationship of facial nerve with pterygopalatine and submandibular ganglia <input type="checkbox"/> Revisit the effects of lesion of facial nerve at different levels Differentiate anatomical basis of clinical presentation of UMN and LMN lesion of facial nerve. 	SGD and dissection	MCQ/ SAQ/OSPE Viva
7	Temporal and Infratemporal region	Correlate the location, boundaries and contents of temporal and Infratemporal fossa with relevant clinical conditions.	<ul style="list-style-type: none"> <input type="checkbox"/> Identify the location, boundaries, contents and communications of temporal and infratemporal fossa on a given model and skull. <input type="checkbox"/> Describe the course and distribution of mandibular nerve from origin to distribution <input type="checkbox"/> Tabulate the attachments, actions and nerve supply of muscles of mastication. <input type="checkbox"/> Trace location, various routes and distribution of otic ganglion <input type="checkbox"/> Justify role of lateral pterygoid as a peripheral heart on anatomical basis of pterygoid venous plexus <input type="checkbox"/> Elucidate importance of pterygoid venous plexus in case of intracranial spread of infection to cavernous sinus. 	SGD and dissection	MCQ/ SAQ/OSPE Viva

			<input type="checkbox"/> Trace origin and distribution of superficial temporal, First and second parts of maxillary artery		
8	Mandible	Elucidate the topographic anatomy of mandible	<input type="checkbox"/> Identify parts of mandible <input type="checkbox"/> Describe ramus and body of mandible with respect to its bony features and attachments.	SGD and dissection	MCQ/ SAQ/OSPE Viva
9	Temporomandibular joint (TMJ)	Correlate the gross anatomical features of temporomandibular joint with clinical significance	<ol style="list-style-type: none"> 1. Identify the type of TMJ. 2. Identify the articular surfaces of TMJ on a given model or dry bones. 3. Explain the attachments of capsule. 4. Name the ligaments of TMJ. 5. Describe the attachments and relations of ligaments of TMJ. 6. Describe the type and shape of articular disc. 7. Justify the presence of two joint cavities and types of movements occurring in each. 8. Describe the movements of jaw at TMJ with special reference to axis and muscles producing them. 9. Describe the clinical signs of anterior dislocation of TMJ and explain the steps of its reduction. 	SGD and dissection	MCQ/ SAQ/OSPE Viva
10	Submandibular region	Correlate the anatomy of Submandibular region with its clinical significance	<input type="checkbox"/> Revisit boundaries of submandibular triangle <input type="checkbox"/> Describe the parts, relations, neurovascular of submandibular gland. <input type="checkbox"/> Trace the routes of submandibular ganglion <input type="checkbox"/> Describe the distribution of submandibular ganglion	SGD and dissection	MCQ/ SAQ/OSPE Viva

			Correlate the anatomy of submandibular fascial space with Ludwig's angina		
11	Parotid region	Correlate the anatomy of parotid region with its clinical significance	<input type="checkbox"/> List contents of parotid region <input type="checkbox"/> Elucidate the surfaces, borders, shape, location, parts, relations and drainage of parotid gland <input type="checkbox"/> Trace the pathway of autonomic supply of parotid gland. <input type="checkbox"/> Enumerate structures embedded in parotid gland in a sequential order. <input type="checkbox"/> Analyze anatomical basis of clinical presentation of mumps. <input type="checkbox"/> Correlate the extracranial course of facial nerve with Bell's palsy.	SGD and dissection	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
12	Hard and soft palate	Correlate the gross anatomy of hard and soft palate with their relevant clinical conditions	<ol style="list-style-type: none"> 1. Discuss the bony framework of hard palate. 2. Identify the gross features of hard palate and soft palate. 3. Identify muscles of soft palate on the model 4. Describe the attachments, nerve supply and actions of muscles of soft palate 5. Describe blood supply and nerve supply of soft palate Identify the main muscles forming the palatoglossal and palatopharyngeal arches	SGD and dissection	MCQ/ SAQ/OSPE Viva
13	Pharynx	Correlate the gross anatomy of pharynx with relevant clinical conditions	<input type="checkbox"/> Differentiate extent, anatomical features, vascular supply, nerve supply of three parts of pharynx on anatomical basis	SGD and dissection	MCQ/ SAQ/OSPE Viva

			<ul style="list-style-type: none"> <input type="checkbox"/> List muscles of pharynx with nerve supply and action <input type="checkbox"/> Name structures passing through the spaces between muscles of pharynx <input type="checkbox"/> Trace origin of pharyngobasilar fascia on base of skull. <input type="checkbox"/> Correlate anatomical knowledge of pharyngobasilar fascia with patency of nasopharynx <input type="checkbox"/> Justify role of Eustachian tube in equalizing middle ear pressure, age related obliquity <input type="checkbox"/> Describe anatomical route of spread of infections from nasopharynx to middle ear. <input type="checkbox"/> Relate boundaries of tonsillar fossa and tonsillar bed with significant structures that must be protected during tonsillectomy. <input type="checkbox"/> Define Kilian's dehiscence 		
14	Nose and paranasal sinuses	Correlate the gross anatomy of Nose and paranasal sinuses with relevant clinical conditions	<ul style="list-style-type: none"> <input type="checkbox"/> Describe the skeletal framework of different walls of nose <input type="checkbox"/> Describe the features, vascular supply, nerve supply and openings in lateral wall of nose <input type="checkbox"/> Describe the features, vascular supply, nerve supply of medial wall of nose <input type="checkbox"/> Highlight the significance of little's area in a case of epistaxis 	SGD and dissection	MCO/ SAQ/OSPE Viva

			<input type="checkbox"/> Trace the location and drainage of paranasal sinuses in skull and on radiograph		
15	Pterygopalatine fossa	Describe the anatomy of Pterygopalatine fossa in relation with surrounding structures	<input type="checkbox"/> Identify the location of pterygopalatine fossa on skull <input type="checkbox"/> List bones forming walls of pterygopalatine fossa <input type="checkbox"/> Enumerate the contents and communications <input type="checkbox"/> Describe the distribution of third part of maxillary artery, nerve and pterygopalatine ganglion <input type="checkbox"/> Justify the role of pterygopalatine ganglion in hay fever/allergies	SGD and dissection	MCQ/ SAQ/OSPE Viva
16	Orbit	Correlate the anatomy of orbital contents with relevant clinical significance.	<input type="checkbox"/> Describe the skeletal framework of bony orbit and its communications <input type="checkbox"/> List the contents of orbit <input type="checkbox"/> Identify the parts of eyeball on a model <input type="checkbox"/> Tabulate the attachments, nerve supply and actions of extraocular muscles <input type="checkbox"/> Justify the movements of extraocular muscles based on their attachments <input type="checkbox"/> Trace the course and distribution of 3, 4 and 6 CN. <input type="checkbox"/> Justify the peculiar Position of eyeball in case of lesion of 3, 4 and 6 CN <input type="checkbox"/> Trace the route and distribution of ciliary ganglion. <input type="checkbox"/> Describe the course and distribution of ophthalmic nerve <input type="checkbox"/> Describe the nerve supply of Lacrimal gland	SGD and dissection	MCQ/ SAQ/OSPE Viva

17	Lacrimal apparatus	Correlate the anatomy of lacrimal apparatus with relevant clinical significance	<input type="checkbox"/> Enumerate the structures forming lacrimal apparatus <input type="checkbox"/> Describe the nerve supply of lacrimal apparatus <input type="checkbox"/> Correlate the anatomical structures of lacrimal apparatus with the features of blocked Lacrimal duct	SGD and dissection	MCQ/ SAQ/OSPE Viva
18	Ear (external, middle and internal)	Correlate the gross anatomy of ear with relevant clinical conditions	<input type="checkbox"/> Describe the gross anatomical features, boundaries, structures and contents of middle ear cavity. <input type="checkbox"/> Describe the structures forming the walls of middle ear cavity on the given model. <input type="checkbox"/> Highlight the importance of infection in middle ear cavity in relation to its communications. <input type="checkbox"/> Trace the pathway and distribution of facial nerve within petrous part of temporal bone.	SGD and dissection	MCQ/ SAQ/OSPE Viva

Skills

S.No	Topic/ Theme	Learning outcomes	Learning Objectives/Contents	Instructional strategies	Assessment tool
1	Gross Anatomy of head and neck	Identify the important structures in region of head and neck on cadavers, specimens and models	Identify muscles, bones, ligaments, nerves, vessels, organs and their parts on given models and dissected specimens.	SGD and dissection	MCQ/ SAQ/OSPE Viva
2	Surface marking	Mark the vital structures of head and neck on skin of a subject	<ol style="list-style-type: none"> Identify the important landmarks of head and neck and mark them on a subject. Mark the parotid duct, thyroid gland, main vessels and nerves of the head and neck on the given subject 	SGD and Skills lab	MCQ/ SAQ/OSPE Viva

3.	Imaging of head and Neck	Identify the important bony landmarks in region of head and neck on xrays.	Identify the important bony landmarks of cervical vertebrae, paranasal sinuses skull on x ray.	SGD and skills lab	MCQ/ SAQ/ OSPE/Viva
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List of Histology practicals

Sr No.	Topics
At the end of these practicals, students will be able to identify/ illustrate following:	
1.	Connective tissue
2.	Cartilage
3.	Bone
4.	Muscle tissue
5.	Oral cavity (Lip, Tongue)
6.	Salivary glands

ANATOMY BLOCK-3 (08 WEEKS)

Couse Outline

Gen Anatomy	Histology	Embryology	Gross Anatomy
Skin & fascia	Lymphoid system	CNS	Brain
Arthrology			
Nervous system-II			

Course Content

General Anatomy

S.No	Topic/ Theme	Learning outcomes	Learning objectives/ Content	Instructional Strategies	Assessment Tool
1.	Skin and Fascia	Apply the general anatomical concept of skin and fascia in understanding of their regional distribution and differentiation	<ol style="list-style-type: none"> 1. Differentiate between thick and thin skin 2. List functions of skin 3. Identify different types of skin creases and lines 4. Define fascia 5. Differentiate between different modifications of fascia. 6. Describe the importance of cleavage lines and wound healing 7. List the structures involved in first, second and third degrees of burns 	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

2.	Arthrology	Anatomize the general features of joints	<ol style="list-style-type: none"> 1. Classify joints according to their structure with examples of each type especially from head and neck (wherever possible) 2. Describe the general structure of a synovial joint 3. Discuss anatomy of joints with reference to dislocation, sprain and inflammation 4. Describe Hilton's law 	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
3.	Nervous system-II	Appraise the basic organization of the main structures that form nervous system	<ol style="list-style-type: none"> 1. Define the grey matter, white matter, ganglion, nucleus and nerve. 2. Appraise a three-dimensional appreciation of the parts of the brain and their relative positions to one another 3. Outline the anatomical organization of autonomic nervous system 	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

SPECIAL HISTOLOGY

S.No	Topic/ Theme	Learning outcomes	Learning objectives/ Content	Instructional Strategies	Assessment Tool
1.	Lymphoid system	Differentiate between H&E stained slides of different components of lymphoid system	<p>KNOWLEDGE</p> <ol style="list-style-type: none"> 1. Enumerate different types of lymphoid cells and identify their distribution in the body 2. Describe the histological features and cells of the lymphoid system 3. Describe the histological features of tonsils, thymus, lymph node <p>SKILL</p> <ol style="list-style-type: none"> 1. Identify histological sections of tonsils, 	<p>LGIS</p> <p>Lab</p>	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

			<p>thymus and lymph node under light microscope and list at least two identification points of each.</p> <p>2. Draw labelled diagrams showing light microscopic structure of tonsils, thymus and lymph node</p>		
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Special Embryology

S.No	Topic/ Theme	Learning outcomes	Learning objectives/ Content	Instructional Strategies	Assessment Tool
1.	CNS	Comprehend the embryological basis behind formation of different components of nervous system and correlate them with various relevant clinical presentations.	<ol style="list-style-type: none"> 1. Explain the development of spinal cord. 2. Describe the positional changes of the cord. 3. Explain the causes of neural tube defects 4. Enlist various variants of spina bifida. 5. Explain the process of development of various variants of spina bifida 6. Summarize primary and secondary brain vesicles with their derivatives. 	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

Brain and Neuroanatomy

S.No	Topic/ Theme	Learning outcomes	Learning objectives/ Content	Instructional Strategies	Assessment Tool
1.	Anatomy of cranial cavity	Appraise the gross features of cranial cavity and the structures contained within it to understand the anatomical basis of clinical conditions related to them.	<ul style="list-style-type: none"> <input type="checkbox"/> Describe and demonstrate the boundaries and gross features of cranial fossae. <input type="checkbox"/> Enlist and demonstrate foramina along with structures passing through them in anterior, middle and posterior cranial fossae. 	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

			<input type="checkbox"/> Recognize and demonstrate the important sutures, fontanelle and impressions on the interior of cranial vault.		
2.	Gross Anatomy of Spinal cord	Correlate the position and functions of the main nervous pathways and nerve cell groups in the spinal cord, with associated segmental injuries and diseases.	<input type="checkbox"/> Explain the gross appearance and the nerve cell groups in the anterior, posterior and lateral gray columns of spinal cord <input type="checkbox"/> Enumerate and illustrate the arrangements of ascending and descending tracts (white matter) in spinal cord at various levels. <input type="checkbox"/> Explain the given clinical conditions related to ascending and descending tracts of spinal cord. <input type="checkbox"/> Trace following pathways of superficial and deep sensations indicating the location of first, second and third order neurons. <input type="checkbox"/> Pain and temperature pathways <input type="checkbox"/> Light touch and pressure pathways <input type="checkbox"/> Discriminative touch, vibratory sense and conscious muscle joint sense. <input type="checkbox"/> Muscle joint sense pathways to the cerebellum <input type="checkbox"/> Posterior spinocerebellar tract <input type="checkbox"/> Anterior spinocerebellar tract	SGD	MCQs/ SEQs/ SAQs/ OSPE VIVA VOCE

			<input type="checkbox"/> Trace following pathways of voluntary movements indicating the location of first, second and third order neurons. <input type="checkbox"/> Cortico spinal tracts		
3.	Gross anatomy of the brainstem	Appraise the anatomy of brainstem to assess the signs and symptoms presented by the patient in identifying the exact location of a structural lesion.	<input type="checkbox"/> Describe the gross appearance and internal structure of the medulla oblongata. <input type="checkbox"/> Illustrate the cross sections of medulla oblongata at different levels. <input type="checkbox"/> Apply the knowledge of neuroanatomy to explain the following clinical conditions: <input type="checkbox"/> Arnold-chiari malformation <input type="checkbox"/> Medial medullary syndrome <input type="checkbox"/> Lateral medullary syndrome Wallenberg. <input type="checkbox"/> Describe the gross features and internal structure of pons. <input type="checkbox"/> Illustrate cross section of pons at different levels showing major structures at each level. <input type="checkbox"/> Analyze the anatomical structures involved in pontine hemorrhage and infarction of pons. <input type="checkbox"/> Describe the gross appearance, internal structure of mid brain. <input type="checkbox"/> Illustrate cross section of midbrain at the levels of superior colliculus and inferior colliculus	SGD	MCQs/ SEQs/ SAQs/ VIVA VOCE

			<p>showing major structures at each level.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Justify the lesions of midbrain structures by the blockage of cerebral aqueduct. <input type="checkbox"/> Identify the gross features of medulla, mid brain and pons on a given model. 		
4.	Gross anatomy of cerebellum & its connections	Outline the structure, function and connections of the cerebellum with the remainder of the central nervous system to understand the anatomical basis of cerebellar dysfunctions.	<ul style="list-style-type: none"> <input type="checkbox"/> Briefly demonstrate the gross features and phylogenetic divisions of cerebellum. <input type="checkbox"/> Enumerate afferent and efferent fibers of superior, middle and inferior cerebellar peduncles. <input type="checkbox"/> List intracerebellar nuclei and types of fibers constituting white matter of cerebellum and. <input type="checkbox"/> List disturbances of voluntary movements, reflexes, ocular movements, speech, posture and gait resulting due to lesions of cerebellum. <input type="checkbox"/> Demonstrate different parts of cerebellum on given model. 	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
5.	Gross anatomy of cerebrum	Appraise the structure, function and connections of the cerebrum with the remainder of the central nervous system to understand the anatomical basis of associated clinical conditions.	<ul style="list-style-type: none"> <input type="checkbox"/> Describe the topographic anatomy of diencephalon and demonstrate its gross features on a given model. <input type="checkbox"/> Enlist main sulci and gyri of cerebral hemispheres and describe the extent of each of them. 	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

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|--|--|--|---|--|
| | | | <ul style="list-style-type: none"><input type="checkbox"/> Explain the divisions of cerebral lobes on superolateral, medial and inferior surfaces of cerebral hemispheres.<input type="checkbox"/> Enumerate fibers making up the white matter of cerebral hemispheres and describe each of them (Summarize parts, relations & fibers forming Internal capsule).<input type="checkbox"/> Mark main sulci and gyri on lobes of cerebral hemispheres.<input type="checkbox"/> Identify commissural, projection and association fibers on brain prosected specimen<input type="checkbox"/> Describe and demonstrate the cortical functional areas in different lobes of cerebral hemispheres.<input type="checkbox"/> Enumerate types of aphasia and describe the lesions of speech areas responsible for producing aphasia.<input type="checkbox"/> Explain the effects of lesion in the primary and secondary visual cortex.<input type="checkbox"/> Illustrate the lateral and medial views of cerebral hemispheres showing motor and sensory areas. | |
|--|--|--|---|--|

6.	Gross anatomy of reticular formation & limbic system	Correlate the structure and function of the reticular formation and parts of the limbic system with associated clinical conditions.	<ul style="list-style-type: none"> <input type="checkbox"/> Outline the general arrangement and functions of reticular formation. <input type="checkbox"/> Enumerate components of limbic system and explain hippocampal formation with reference to its afferent and efferent connections. <input type="checkbox"/> Identify different components of limbic system on given model. 	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
7.	Gross anatomy of basal nuclei	Recognize the location, connections and functions of basal nuclei to explain its common relevant diseases	<ul style="list-style-type: none"> <input type="checkbox"/> List terminology commonly used to describe the basal nuclei. <input type="checkbox"/> Outline Parkinson disease regarding etiology, characteristics signs and symptoms, types and treatment <input type="checkbox"/> identify different components of basal ganglia on given model/specimen 	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
8.	Gross anatomy of cranial nerves	Appraise the location and connections of motor and sensory nuclei of the cranial nerves to identify the correct site of relevant cranial nerve lesions.	<ul style="list-style-type: none"> <input type="checkbox"/> Enumerate the cranial nerves and classify them into sensory, motor and mixed nerves. <input type="checkbox"/> Describe the nuclei and intracranial course of all cranial nerves. <input type="checkbox"/> Apply the knowledge of neuroanatomy to explain the clinical conditions regarding the lesions of various cranial nerves. <input type="checkbox"/> Identify different cranial nerves on given model/specimen 	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

9.	Gross anatomy of thalamus, Hypothalamus & their connections	Appraise the structure, function and connections of the thalamus and hypothalamus with the remainder of the central nervous system to understand the anatomical basis of associated clinical conditions.	<input type="checkbox"/> Describe the divisions, nuclei and connections of thalamus. <input type="checkbox"/> Summarize the connections of hypothalamus with the pituitary gland. <input type="checkbox"/> Enlist the functions of main hypothalamic nuclei.	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
10.	Gross anatomy of meninges and Dural venous sinuses of brain & spinal cord	Appraise the arrangement of the meninges of brain and spinal cord to identify different types of cerebral hemorrhages.	<input type="checkbox"/> Define meninges of brain and describe the Dural reflections in brain. <input type="checkbox"/> Explain the meninges of spinal cord <input type="checkbox"/> Enumerate the nerves and blood vessels supplying the meninges. <input type="checkbox"/> Differentiate among different varieties of intracranial hemorrhages. <input type="checkbox"/> Demonstrate the supratentorial and infratentorial compartments of tentorium cerebelli in a prosected specimen. <input type="checkbox"/> Define and enumerate paired and unpaired Dural venous sinuses along with their attachments. <input type="checkbox"/> Describe the location, important relations, communications of cavernous sinus and enumerate structures passing through it.	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

11.	Gross anatomy of ventricular system, CSF, Blood brain & blood-CSF barriers	Appraise the anatomical organization of ventricular system, CSF, Blood brain & blood-CSF barriers to explain the relevant clinical scenarios	<input type="checkbox"/> Describe the anatomical organization of ventricular system and boundaries of third ventricle and choroidal plexus of each ventricle. <input type="checkbox"/> Define arachnoid villous and outline the role of arachnoid villi in absorption of CSF. <input type="checkbox"/> Outline the formation of different barriers of brain. <input type="checkbox"/> Summarize the floor of fourth ventricle.	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
12.	Blood supply of the brain and spinal cord	Outline the blood supply of the brain and spinal cord	<input type="checkbox"/> Recognize the blood supply of different parts of brain and spinal cord. <input type="checkbox"/> Outline the formation and importance of veins of brain. <input type="checkbox"/> Enumerate the vessels taking part in formation of circle of Willis with its importance. <input type="checkbox"/> Relate the interruption of cerebral circulation of cerebral artery syndromes due to anterior, middle and posterior cerebral artery occlusion. <input type="checkbox"/> Illustrate circle of Willis.	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

List of Histology practicals

Sr No.	Topics
At the end of these practicals, students will be able to identify/ illustrate following:	
1.	Lymphoid system (Lymph node)
2.	Thymus
3.	Tonsil (Palatine, pharyngeal)

Learning Resources

GROSS ANATOMY	
Text Books	Reference Books
Clinically oriented Anatomy By Keith L Moore (8 th Edition)	LAST`s Anatomy Regional & Applied (12 th Edition)
Clinical Anatomy for medical students By Richard S. Snell (10 th Edition)	Gray`s Anatomy By Henry Gray`s (41 st Edition)
Cunningham`s manual of practical anatomy 15 th Edition Vol-1 (Upper limb & Lower limb) Vol-2 (Abdomen & Thorax) Vol-3 (Head & Neck, Brain) (Only For BDS) Photocopy of "General Introduction" from Cunningham`s manual Vol-I (Page 1-19) (Only For BDS)	Atlas of Anatomy By Netter (7 th Edition)/ Atlas of Anatomy By Grant`s
Sketch book Gross	
Clinical Neuroanatomy By Richard S. Snell (8 th Edition) only for BDS	Atlas of Anatomy By Netter (6 th Edition)/ Atlas of Anatomy By Grant`s
	Museum Atlas
HISTOLOGY	
Text Books	Reference Books
Basic Histology By Luiz carlos Junqueira (14 th Edition)	Medical Histology by Prof. Laiq Hussain (6 th edition)
Di-fiore`s Atlas of Histology (13 th Edition)	
Manual of Histology Vol - I Manual of Histology Vol - II (for BDS only) By Prof Dr Tassaduq Hussain Shaikh/ Contextual Journal of Histology	
GENERAL ANATOMY	
Text Books	Reference Books
General Anatomy by Prof Laiq Hussain (5 th edition)	General Anatomy By Dr Tassaduq Hussain Shaikh(16 th Edition)
	General Anatomy By Prof Dr Ghulam Ahmed (7 th Edition)
EMBRYOLOGY	
Text Books	Reference Books
Langman`s Medical Embryology(14 th Edition)	Netter`s Embryology Atlas
The Developing Human By Keith L-Moore (11 th Edition)	

- All books are available at College Bookshop (CMH LMC & IOD).

Other Learning Resources

Hands-on activities	Students will be involved in practical session and hands-on activities to enhance learning.
Lab, Museum and Dissection Hall	Utilize the lab to relate knowledge to specimens and models available.
Videos	Animated videos of developmental histology, simulated patients etc. to clear the concepts of the students shown during interactive lecture sessions.
Computer lab/CDs/DVDs/Internet resources	To increase the knowledge, students should utilize the available internet resources and CDs/DVDs in main IT lab/personal laptops.
Self-study	Self-study is incorporated to help the student in managing individual tasks/assignments. Student will search for information through available resources.

Cadavers and Specimens in Anatomy Department

Sr. No	Subject (items in Dissection Hall)	Description
1	Mortuary	Full Cadavers
		Torso
2	Specimens in jars	Brain
		Head & Neck
		Upper Limb
		Lower Limb
		Thorax
		Abdomen/Pelvis
		Embryology
3	Specimens in tanks	Upper Limb
		Lower Limb
4	Specimens in buckets	Lungs
		Heart

Sr. No	Subject (items in Dissection Hall)	Description
		Liver
		Cut vertebral column
		Foot
		Spleen
		Spine
		Abdominal wall
		Thoracic wall
		Abdomen
		Intestine
		Kidney
		Head and Neck
		Abdomen
		Pelvis
		Female pelvis
		Thorax

List of Study Models in Anatomy Museum

Sr. No.	Item Names
1	Head & neck
2	Brain / spinal cord
3	Lower limb
4	Upper limb
5	Thorax
6	Abdomen
7	Pelvis & perineum
8	General Embryology
9	Special Embryology
10	Histology

Sr. No.	Item Names
11	Whole Skeletal
12	Skull
13	Lower limb joints
14	Upper limb joints
15	Vertebral column
16	Whole pelvis
17	Torso

Histological Slides, Equipment and Facilities in Histology Lab

Sr. No.	Items
1	Local & imported slides of General and Special histology
2	Slides of Embryology
3	Slides of Neuroanatomy
4	Binocular microscopes
5	Multi-head teaching microscope
6	Tissue processor
7	Microtome (rotary)
8	Embedding station
9	Operation room
10	Refrigerator (large)
11	Computer with internet facility
12	Stools

Summative Assessment Methods and Policies

Internal Assessment

- Weightage of internal assessment shall be 20%, each for theory and practical, in BDS Professional Examination.
- The Internal Assessment shall comprise of monthly test / assignments / class presentation / send-ups /class tests / OSPE etc.
- The Internal Assessment record shall be kept in the respective department of the College / Institute and after approval of Principal, a summary as per university registration number shall be furnished to the Controller of Examinations, at least two weeks before the commencement of final examination.
- The result of all the class tests / tools which contribute towards IA will be displayed to the students during an academic year.
- The same internal assessment shall be counted both for annual and supplementary examinations. The students who are relegated, however, can improve the internal assessment during subsequent year
- Internal assessment tools of any subject may be changed after the approval of respective FBS.

Annual Examination

- The weightage of Annual Examination shall be 80%, each for theory and practical, in BDS.
- The examination comprises of a theory paper and practical/clinical examinations as per PMC regulations and the Table of Specifications (TOS) of the University.
- The gap between two consecutive theory papers shall not be more than two days.
- The Theory Paper shall be of 3-hours duration, held under the arrangements of the university. It shall have two parts: MCQs and SEQs for the year 2022. It may be changed after the approval of Academic Council.

Internal Examiner

He/she shall be Professor and Head of department who has been involved in teaching of the class being examined for at least six months. Second preference shall be Associate/Assistant Professor who is involved in teaching of the class and posted there for one year. Third preference shall be a recognized Professor of the subject.

External Examiner

He/she shall be a Professor/Associate Professor of a recognized Medical/Dental College or at least an Assistant Professor with three years teaching experience in the relevant subject.

Conflict of Interest

No person shall serve as an examiner whose close relative (wife, husband, son, daughter, adopted son, adopted daughter, grand-son, grand-daughter, brother, sister, niece /nephew, son and daughter-in-law brother and sister- in-law, parental and maternal uncle and aunt etc) is appearing in the examination. All examiners likely to serve as an examiner shall render a certificate in compliance to this para.

Paper Setting

- Each College / Institute shall forward a set of two question papers as per TOS along with the key for each subject to the Controller of Examinations, at least three months in advance of the annual examination. The question paper as a whole / a question without a comprehensive key shall not be considered towards final paper setting.
- The set of question papers shall be prepared by the respective Head of department and furnished to Controller of Examinations through Head of Institution (HoI).
- The Controller of Examinations shall approve the faculty for the final paper setting having fair representation of each college / institute.

Paper Assessment

- The Controller of Examinations shall approve the faculty for the theory paper marking, to be undertaken in the manner as deemed appropriate.
- The Examination Directorate shall coordinate directly with the faculty, earmarked for the paper marking.
- A student who scores 85% and above marks in any subject shall qualify for distinction in that particular subject.
- A fraction in aggregate marks of a subject shall be rounded off to whole number. If it is less than 0.5 then it will be rounded off to the previous whole number while 0.5 or more will be rounded off to the next whole number.

Practical Examinations

- The Controller of Examiners shall approve the faculty to serve as the internal & external examiners.
- The number of external and internal examiners shall be equal.
- One external & internal examiner each shall be marked for a group of 100 students.
- Candidates may be divided into groups practical examinations and be standardized by incorporating OSPE stations.
- Practical examination shall be held after the theory examination of the subject but in special cases, it may be held before the theory examination with the approval of the Controller of Examinations. For the purpose of practical/clinical examination, the candidates may be divided into subgroups by the examiners.

- The assessment of the practical examination duly signed by internal & external examiner shall be furnished to the Controller of Examinations within one week of the conclusion of examination.

Pass Marks

- Pass marks for all subjects shall be 50 % in theory and practical, separately.
- No grace marks shall be allowed to any student in any examination.

Declaration of Result

Every effort shall be made to declare the result of each examination within one month of the last practical examination or earlier.

Promotion

No student shall be promoted to the higher classes unless he/she passes all the subjects of the previous class

Re-totaling

Any student may apply to the Controller of Examinations on a prescribed form along with the specified fee.

Supplementary Examination

The interval between a supplementary examination and the previous professional examination shall not be more than two months. There shall be no special supplementary examination.

Academic Audit

The Vice Chancellor may get any academic matter deliberated in the manner as deemed appropriate.

Issue of Academic Transcript/Detailed Marks Sheet

A student desirous of obtaining Academic Transcript / Detailed Mark Sheet may apply to Controller of Examinations along with the prescribed fee for each original copy.

Withdrawal/Failure

Any student who fails to clear the first Professional in BDS or first in four chances, availed or un-availed, shall be expelled as per PMC policy and shall not be eligible for fresh admission as a fresh candidate in either BDS.

Proposed First Professional BDS Examination - 2022
ANATOMY

Table of Specifications for Annual First Professional Examination: Theory

Time Allowed	=03 hrs	<i>(Including MCQs)</i>
Marks of theory paper	=80	
Internal assessment	=20	
Total marks	=100	
Pass Marks	=50	
40 x MCQs (on separate sheet)	(40 Marks)	Time = 50 Minutes
Q. No. 1,2,3,4,5,6,7,8		
5 x SAQs/SEQs (Recall)	= 05 marks each	
3 x SAQs/SEQs (Application)	= 05 marks each	
Total Marks	=40 Marks	Time = 2 hour & 10 Minutes

S. No	Topic	No of MCQs (40) (Recall=25, Application=15) (1 mark each)	No of SAQ/SEQs (08) 05x SAQ/SEQs (Recall) 03x SAQ/SEQs (Application) (05 marks each)
1.	General Anatomy	05	01
2.	General Histology Special Histology	05 03	01
3.	General Embryology Special Embryology	04 04	01
4.	Gross Anatomy (Head & Neck) Neuroanatomy	10 09	03 02
	Total	40 (40 Marks)	08 (40 Marks)

Theory: Internal Assessment (IA) Calculation (20 Marks)

Exams	Weightings	Exams	Percentage
End of Block & Pre- annual Exams	80%	End of Block Exam - I	20
		End of Block Exam - II	20
		End of Block Exam- III	20
		Pre-Annual Exam	20
Modular/ Class Performance	20%	Modular/ Class Tests	20
Total	100%		100%

TOS for viva/practical

VIVA 40 marks		OSPE 40 marks	Total Marks (viva + practical)	Internal assessment	Grand Total
Internal	External				
20 marks	20 marks	40 marks	80 marks	20 marks	100 marks

OSPE (40 marks)				
Stations	Topic	No of stations	Marks per station	Total marks
Histology Unobserved	Histology spotting (OSPE)	10	01	10
Histology Observed	Histology long slide	05		08
	Histology manual	03		
Gross Unobserved	Gross anatomy & Embryology spotting	09	02	18
Gross Observed	Surface marking	01	03	03
Radiology		02	0.5	01
Total		23 stations		40 marks

Practical: Internal Assessment Calculation (20 Marks)

Exams	Weightings	Exams	Percentage
End of Block & Pre- annual Exams	80%	End of Block Practical/OSPE I	20
		End of Block Practical/OSPE II	20
		End of Block Practical/OSPE III	20
		Pre-Annual Exam	20
Class Performance	20%	*SGD/ CBL/ PBL/ Practical	20
Total	100%		100%

CBL/Assignments /Gross Sketch copies are part of Formative Assessment *

SGD= Small Group Discussion

CBL= Case Based Learning

PBL= Problem Based Learning

Curriculum Map Anatomy

By the end 1st Year of dental Academic Year, students should be able to co-relate normal anatomical structures of human body with emphasis on Head & Neck and Brain Regions along with their clinical significance at macroscopic microscopic and developmental level.

