****

**STUDY GUIDE**

**DEPARTMENT OF ANATOMY**

****

**LAHORE MEDICAL AND DENTAL COLLEGE**

**Department of Anatomy, 2023**

**STUDY GUIDE OF ANATOMY FOR BDS STUDENTS**

**PREPARED BY: PROF. DR. ARUNA BASHIR**

**INTRODUCTION**

Medical education is a life-long process and BDS curriculum is a part of the continuum of education from pre-dental education, BDS, proceeding to house job, and post-graduation. PMDC outlines the guiding principles for undergraduate dental curriculum and has defined the generic competencies and desired outcomes for a dental graduate to provide optimal health care, leading to better health outcomes for patients and societies.

**PURPOSE OF GUIDE**

To facilitate learning of the students by enlightening leaning outcomes, content/syllabus given by PMDC, teaching and learning methodologies, learning resources available in the department of Anatomy and institution, assessment methods, examination regulations, academic planners and time tables. This will facilitate students in planning their educational activities in the subject of Anatomy for the one year period for BDS.

**TARGET AUDIENCE**

1st year BDS students

**DURATION OF SESSION**

1 year for BDS students

**DEPARTMENTAL STAFF HIERARCHY PLAN**

**BDS**

Prof. Dr. Aruna Bashir (Prof.)

Dr. Shamaila Ejaz (Demonstrator)

Dr. Jibran Riaz (Demonstrator)

**LABORATORY ASSISTANTS**

M. Ismaeel Khan

M. Imran

M. Waseem

**LABORATORY ATTENDANTS**

M. Tariq

Arif Masih

**CURATOR OF MUSEUM**

Shahzeb Imran

Humayun Sarfraz

**CLEANERS**

Rafaqat Masih

Amir Masih

**COMPUTER OPERATOR**

Shahid Raza

**OFFICE BOY**

M. Amjad

**LEARNING OBJECTIVES**

At the end of the 1st year BDS course in Anatomical Sciences the undergraduate student should be able to:

* Identify the key concepts of the structure of human anatomy particularly of head and neck.
* Correlate clinical anatomy with physical diagnosis, radiologic findings and invasive procedures.
* Comprehend anatomical basis of disease and injury related to head and neck region.
* Comprehend structure of the various tissues, a pre-requisite for understanding of the disease processes.
* Comprehend nervous system to locate the site of lesions according to the sensory and or motor deficits encountered.
* Understand the basis of abnormal development, critical stages of development, effects of teratogens, genetic mutations and environmental hazards.
* Demonstrate an understanding of clinical presentations and strategies for health maintenance.
* Build communication skills while involved in peer teaching of clinical anatomy.

**TEACHING METHODOLOGIES FOR ANATOMY**

* Interactive Lectures
* Gross Anatomy Demonstrations to Small Group
* Histology Practical Demonstrations to small group
* Power Point Presentations by students
* Clinico-Anatomical conferences
* Self Directed Learning
* Virtual dissection on Virtual Dissection Table

**ATTENDANCE REQUIREMENT FOR ANATOMY**

1. Students are expected to attend all scheduled teaching sessions and examinations
2. Attendance in lectures, practicals, and demonstrations is mandatory. Absence from these sessions will make the students ineligible to sit the final summative assessment.
3. A minimum of 75 % attendance in the lectures, practicals and demonstrations is mandatory to appear in the summative UHS examination
4. Attendance will be recorded through a log-in/log-out biometrics system
5. Absence due to illness must be certified appropriately by the General Physician

**SYLLABUS FOR 1ST PROFESSIONAL BDS (PMDC AND UHS)**

**GENERAL ANATOMY**

* Body organization
* Various disciplines of anatomy
* Anatomical nomenclature
* Anatomical planes
* Descriptive terminology
* Body regions
* Important definitions

Bones

* Introduction
* Functions of bones
* Organization of skeletal system
* Surface features of bone
* Shape of bones
* Structure of bone
* Bones development and growth
* Bone remolding
* Clinical considerations
* Development disorders
* Nutritional and hormonal disorders
* Neoplasm of bones
* Aging and bones
* Osteoporosis

Cartilages

* Introduction
* Structural classification
* Regional distribution

Joints

* Introduction
* Classification according to range of movement
* Classification according to structure
* Structure of synovial joint
* Classification of synovial joints
* Movement at synovial joint
* Clinical considerations
* Trauma to joints
* Diseases of joints

Muscles

* Introduction
* Functions of muscles
* Classification
* Muscle attachments
* Blood supply and nerve supply
* Neuromuscular junctions
* Applied anatomy of muscles with reference to spasm

Cardiovascular system

* Introduction to CVS
* Classification of blood vessels
* Various types of blood circulations
* Anastomosis
* Introduction to lymphatic system
* Lymph nodes

Nervous system

* Introduction
* Different parts of CNS with their brief description
* Peripheral nervous system
* Autonomic nervous system

Introduction to

* Radiography
* CT scan
* MRI
* Ultrasonography
* Angiography

**GROSS ANATOMY**

The gross anatomy of head and neck, spinal cord and brain is included in course. Gross anatomy of these regions is taught through dissection and demonstrations. Special emphasis and study is to be placed on oral and maxillofacial regions. Lectures should stress morphological concepts, functional correlations and practical applications to clinical problems. Lectures on radiographic anatomy of head and neck and the development of human body should also be integrated with teaching gross anatomy.

PRACTICAL WORK

Study of gross anatomical features of dissected out specimens of head and neck, brain and spinal cord. This includes demonstrations on models and dissected parts.

ESSENTIAL SKILLS

The candidate should be able to perform following

* Cadaveric dissection to identify important anatomical structures
* Surface marking of anatomical structures
* Identification of important anatomical structures on study models

**EMBRYOLOGY**

* Gametogenesis
* Fertilization
* Embryonic period with emphasis on granulation and derivatives of germ layers
* Development of head and neck including eye , ear and related congenital anomalies

**HISTOLOGY**

* General histology
* Introduction
* Cell
* Epithelium
* Connective tissue
* Muscle
* Nervous tissue
* Circulatory system
* Lymphatic system
* Integumentary system
* Special histology
* Special histology of head and neck (including eye , ear ,trachea and esophagus)

**ALLOCATION OF CREDIT HOURS IN BDS COURSE**

Lecture Hours 100 Hrs

Practical Hours 300 Hrs

Total Hours 400 Hrs

**ALIGNMENT OF EDUCATION WITH TIME TABLE**

**1ST YEAR BDS HISTOLOGY LECTURES SCHEDULE 2023**

|  |  |
| --- | --- |
| **DATE** | **TOPIC** |
| 20/2/23 | Epithelium 1 |
| 24/2/23 | Epithelium 2 |
| 3/3/23 | Glandular epithelium |
| 6/3/23 | Cell junction and cell surface specialization |
| 7/3/23 | Connective tissue 1 |
| 9/3/23 | Connective Tissue 2 |
| 10/3/23 | Connective Tissue 3 |
| 14/3/23 | Bone and Cartilage 1 |
| 16/3/23 | Bone and Cartilage 2 |
| 21/3/23 | Muscle tissue 1 |
| 28/3/23 | Muscle tissue 2 |
| 30/3/23 | Circulatory system 1 |
| 4/4/23 | Circulatory system 2 |
| 6/4/23 | Revision |
| **7/4/23** | **TEST 1** |
| 11/4/23 | Nervous tissue 1 |
| 13/4/23 | Nervous tissue 2 |
| 18/4/23 | Nervous tissue 3 |
| 20/4/23 | Lymphoid system 1 |
| 25/4/23 | Lymphoid system 2 |
| 27/4/23 | Lymphoid system 3 |
| 2/5/23 | Integumentary system 1 |
| 4/5/23 | Integumentary system 2 |
| 9/5/23 | GIT |
| 11/5/23 | GIT |
| 16/5/23 | Respiratory system |
| 18/5/23 | Respiratory system |
| 23/5/23 | Eye |
| 25/5/23 | Ear |
| 30/5/23 | Endocrine |
| 1/6/23 | Endocrine |
| **25/8/23** | **TEST 2** |

**1ST YEAR BDS EMBRYOLOGY LECTURES SCHEDULE 2023**

|  |  |
| --- | --- |
| **DATE** | **TOPIC** |
| 12/9/23 | Gametogenesis |
| 13/9/23 | Gametogenesis |
| 14/9/23 | Gametogenesis |
| 18/9/23 | Ovarian cycle |
| 19/9/23 | Fertilization |
| 20/9/23 | Cleavage, Blastocyst formation, Uterus at the time of implantation |
| 21/9/23 | 2nd week of development |
| 22/9/23 | 2nd week of development |
| 25/9/23 | 2nd week of development |
| 26/9/23 | Gastrulation |
| 27/9/23 | Notochord formation and neurulation, fate map |
| 29/9/23 | Growth of embryonic disc,  |
| **2/10/23** | **TEST 1** |
| 3/10/23 | Further development of trophoblast |
| 4/10/23 | Embryonic period 3-8 week of development |
| 5/10/23 | Embryonic period 3-8 week of development |
| 6/10/23 | Embryonic period 3-8 week of development |
| 9/10/23 | Embryonic period 3-8 week of development |
| 10/10/23 | Fetal period monthly changes |
| 11/10/23 | Head and Neck |
| 12/10/23 | Head and Neck |
| 13/10/23 | Head and Neck |
| 16/10/23 | Head and Neck |
| 17/10/23 | Birth Defects |
| 18/10/23 | Teratology |
| 19/10/23 | Special senses 1 |
| 20/10/23 | Special senses 2 |
| 23/10/23 | Special senses 3 |
| 24/10/23 | Special senses 4 |
| **30/10/23** | **TEST 2** |

**1ST YEAR BDS GENERAL ANATOMY LECTURE SCHEDULE 2023**

|  |  |
| --- | --- |
| **Date** | **Topic** |
| 24/2/23 | Introduction |
| 3/3/23 | Bones and Cartilages |
| 10/3/23 | Bones and Cartilages |
| 17/3/23 | Bones and Cartilages/ Joints |
| 24/3/23 | Joints |
| 31/3/23 | Joints |
| 7/4/23 | Muscles |
| 14/4/23 | Muscles |
| 21/4/23 | Muscles and structures related to muscles  |
| 5/5/23 | Cardiovascular system |
| 19/5/23 | Cardiovascular system |
| 19/5/23 | Nervous system |
| 26/5/23 | Nervous system/Skin |
| **20/11/23** | **Test** |

**1ST YEAR BDS HISTOLOGY PRACTICAL SCHEDULE 2023**

|  |  |
| --- | --- |
| **DATE** | **TOPIC** |
| 20/2/23 | Microscope |
| 27/2/23 | Epithelium 1 |
| 6/3/23 | Epithelium 2 |
| 13/3/23 | Glandular epithelium |
| 20/3/23 | Connective tissue 1 |
| 27/3/23 | Connective tissue 2 |
| 3/4/23 | Cartilage  |
| 10/4/23 | Spongy and compact bone |
| 17/4/.23 | Smooth, skeletal and cardiac muscle |
| 8/5/23 | Circulatory system |
| 15/5/23 | Circulatory system |
| 22/5/23 | Peripheral nerve and ganglia |
| 29/5/23 | Spinal cord, cerebellum and cerebrum |
| 5/6/23 | Lymphoid system 1 |
| 12/6/23 | Lymphoid system 2 |
| 17/7/23 | Integumentary system |
| 24/7/23 | Tooth/gum/tongue |
| 31/7/23 | Oral cavity/lip/salivary glands |
| 7/8/23 | Esophagus |
| 21/8/23 | Epiglottis/trachea |
| 28/8/23 | Pinna/eyelid/cornea |
| 4/9/23 | Retina |
| 11/9/23 | Endocrine |
| 18/9/23 | Endocrine |
|  | **TEST**  |

**1STYEAR BDS TEACHING SCHEDULE FOR HEAD AND NECK**

**SESSION 2023**

|  |  |
| --- | --- |
| **DATE** | **TOPIC** |
| 20/2/23 | Introduction (Terms, bones, anatomical position) |
| 21/2/23 | Skull (Norma Verticalis) |
| 22/2/23 | Skull (Norma Frontalis) |
| 22/2/23 | Scalp |
| 23/2/23 | Scalp + Face (Muscles of facial expression) |
| 24/2/23 | Face (Muscles of facial expression) |
| 27/2/23 | Face(Blood vessels)  |
| 28/2/23 | Face Extracranial course of facial nerve  |
| 1/3/23 | Clinical |
| 1/3/23 | Lacrimal Apparatus +eyelids and palpabrae |
| 2/3/23 | Deep cervical fascia |
| 3/3/23 | Deep cervical fascia |
| 6/3/23 | Posterior triangle of neck |
| 8/3/23 | Posterior triangle of neck |
| 10/3/23 | Revision |
| **13/3/23** | **SUBSTAGE 1** |
| 15/3/23 | Anterior triangle of neck |
| 17/3/23 | Anterior triangle of neck |
| 20/3/23 | Anterior triangle of neck |
| 22/3/23 | Anterior triangle of neck |
| 24/3/23 | Cranial fossa |
| 27/3/23 | Meninges |
| 29/3/23 | Meninges |
| 29/3/23 | Venous sinuses |
| 31/3/23 | Venous sinuses and pituitary gland |
| **3/4/23** | **SUBSTAGE 2** |
| 5/4/23 | Orbital cavity and muscles |
| 7/4/23 | Ophthalmic nerve  |
| 10/4/23 | 3,4,6 cranial nerves |
| 12/4/23 | Vessels of the orbit |
| 14/4/23 | Hyoid Bone |
| 14/4/23 | Mandible |
| 17/4/23 | Temporomandibular joint |
| 19/4/23 | Temporal & infratemporal fossa,  |
| 19/4/23 | Mandibular nerve |
| 21/4/23 | Pterygopalatine fossa, maxillary nerve |
| 26/4/23 | Muscles of mastication  |
| 26/4/23 | Maxillary artery |
| 27,28/4/23 | Revision |
| **2/5/23** | **SUBSTAGE 3** |
| 3/5/23 | Thyroid and parathyroid gland |
| 5/5/23 | Submandibular gland |
| 8/5/23 | Parotid gland |
| 10/5/23 | Tongue, Oral cavity and hypoglossal nerve |
| 12/5/23 | Hard palate |
| 12/5/23 | Soft palate |
| 15/5/23 | Pharynx |
| 17/5/23 | Pharynx |
| 19/5/23 | Nose |
| 22/5/23 | Larynx |
| 24/5/23 | Larynx |
| 26/5/23 | Base of skull |
| 29/5/23 | External ear + Middle ear cavity  |
| 31/5/23 | Middle ear cavity |
| 2/6/23 | Internal ear |
| 5/6/23 | 7,8 cranial nerves, Eyeball |
| 7,9/6/23 | Revision |
| **12/6/23** | **SUBSTAGE 4** |
| 14/6/23 |  Norma lateralis  |
| 14/6/23 | Norma occipitalis, Cervical vertebrae |
| 19/7/23 |  Joints of neck |
| 21/7/23 | Muscles of prevertebral region, suboccipital triangle and scalene muscles |
| 24/7/23 | Muscles of prevertebral region, suboccipital triangle and scalene muscles |
| 26/7/23 | Cervical sympathetic trunk, cervical plexus + Dermatomes of neck  |
| 26/7/23 | Subclavian system and cervical part of oesophagus and trachea |
| **17/723** | **FINAL STAGE 1** |
|  | Cranial nerves 9,10,11 |
|  | Cranial nerves 9,10,11 |
| **31/7/23** | **FINAL STAGE 2** |

**1ST YEAR BDS TEACHING SCHEDULE OF BRAIN 2023**

|  |  |
| --- | --- |
| **DATE** | **TOPIC** |
| 1/8/23 | Spinal cord |
| 2/8/23 | Spinal cord |
| 3/8/23 | Spinal cord |
| 4/8/23 | Spinal cord  |
| 7/8/23 | Medulla |
| 8/8/23 | Medulla |
| 9/8/23 | Pons |
| 10/8/23 | Pons |
| 11/8/23 | Mid brain |
| 15/8/23 | Mid brain |
| 16/8/23 | Floor of fourth ventricle and Auditory pathway |
| 17/8/23 | Cerebellum |
| 18/8/23 | Revision |
| **21/8/23** | **SUBSTAGE 1** |
| 22/8/23 | Cerebellum |
| 23/8/23 | Cerebral cortex |
| 24/8/23 | White matter including internal capsule |
| 25/8/23 | Basal ganglia |
| 28/8/23 | Thalamus |
| 29/8/23 | 3rd Ventricle, metathalamus, |
| 30/8/23 | Hypothalamus, epithalamus, subthalamus |
| 31/8/23 | Lateral ventricle, 4th ventricle, CSF, cisterns |
| 1/9/23 | Lateral ventricle, 4th ventricle, CSF, cisterns |
| 4/9/23 | Limbic system |
| 5/9/23 | Blood supply of brain |
| 6/9/23 | Olfactory and visual pathways |
| 7,8/9/23 | Revision |
| **11/9/23** | **SUBSTAGE 2** |
| **18/9/23** | **FINAL STAGE** |

**TEST SCHEDULE 1ST YEAR BDS SESSION 2023**

|  |  |
| --- | --- |
| **Date** | **Test** |
| 13/3/23 | H&N Substage 1 |
| 3/4/23 | H&N Substage 2 |
| 7/4/23 | Histology Test 1 |
| 2/5/23 | H&N Substage 3 |
| 12/6/23 | H&N Substage 4 |
| 17/7/23 | Final Stage 1 Head and Neck |
| 31/7/23 | Final Stage 2 Head and Neck |
| 21/8/23 | Brain Substage 1 |
| 25/8/23 | Histology Test 2 |
| 11/9/23 | Brain Substage 2 |
| 18/9/23 | Final Stage Brain |
| 2/10/23 | Embryology Test 1 |
| 30/10/23 | Embryology Test 2 |
| 20/11/23 | General Anatomy Test |

**ASSESSMENT METHODOLOGY FIRST PROF. BDS**

**FORMATIVE**

**SUMMATIVE** (To be held at the end of the year)

One Written Paper

**Marks Distribution:**

Paper Marks 90

Internal Evaluation Marks 10

Oral & Practical Marks 90

Internal Evaluation Marks 10

Total Marks 200

**TABLE OF SPECIFICATIONS FOR FIRST PROF. BDS WRITTEN PAPER (UHS)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Contents** | **MCQs** | **SEQs** |
| 1 | General Anatomy | 3 | 1 |
| 2 | General Embryology (Gametogenesis, fertilization and embryonic period) | 3 | 1 |
| 3 | Development of head and neck including development of eye and ear | 3 | 1 |
| 4 | General Histology (Introduction to histology and microscopes, microscopic structure of the cell, epithelial tissue, connective tissue, muscle tissue, nervous tissue, circulatory system, lymphoid system and integumentary system)  | 6 | 2 |
| 5 | Special Histology of head and neck including histology of eye ear trachea and esophagus | 3 | 1 |
| 6 | Gross Anatomy of head and neck | 21 | 7 |
| 7 | Gross structures of brain and spinal cord | 6 | 2 |
|  | Total Items | 45 | 15 |
|  | Total Marks | 45X1=45 | 15X3=45 |

**LEARNING RESOURCES FOR BDS STUDENTS**

**Recommended books**

**The latest edition of following books are recommended**

* Langman’s Medical Embryology By Saddler
* The Developing Human By Moore And Persaud
* Color Atlas Of Anatomy By Mc Minn
* Anatomy For Dental Students By Johnson And Moore
* Clinical Neuroanatomy By R. Snell
* Last’s Anatomy By Mc Minn
* Clinically Oriented Anatomy By Moore
* Gray’s Anatomy For Students
* Cunningham Manual Of Practical Anatomy Vol.III
* Basic Histology Junqueira, Carneiro Contopoulos
* Wheater’s Functional Histology Text And Color Atlas
* Atlas of Histology by Difoire’s
* Medical Histology by Dr. Laiq Hussain Siddique.

**Technologies to be used:**

* Online reading material through HEC digital library facility