Study Guide
2nd Year MBBS

Sharif Medical & Dental College, Lahore

Vision & Mission of UHS

Qualitative and Quantitative Revolution in Medical Education and Research through Evolution and thereby improve Health Care delivery to Populace.

UHS shall be innovative global center of excellence in learning and research, supporting a community of scholars and professionals committed to serving society, promoting the development of students to reach their true potential in becoming competent, ethical, caring and inquiring health professionals for the benefit of the country and the wider world.

Vision of SMDC

To be recognized for the provision of a safe and functional environment conducive to collaborative teaching & learning, comfortable working atmosphere and conducting world class research through professionalism and excellence.

Department of Anatomy

PREFACE

Study guides are aimed at helping students fully comprehend their curriculum and its objectives. While textbooks are widely regarded as the most important learning resource, they require augmentation by facilitation and practical guidance. With a well-designed study guide, a student would have acquaintance with the goals of learning the curriculum and assessment modalities. In short, the student shall have insight into the entire timeline of the academic year.

As advised by UHS, the annual academic schedule is followed at SMDC. The students of MBBS are taught anatomy for the first two years of their degree course, while BDS students study anatomy during their first year. For MBBS students, Gross Anatomy, General Anatomy, Histology, and Embryology are covered in two years, with the regions divided between them. The Anatomy Department has created a course plan that fits our institution's vision and the UHS guidelines. This study guide includes a comprehensive list of the sections taught in our department, the time allocated for each of them, and the teaching techniques employed such as small group discussions, lectures, practicals and demonstrations on bones, dissected specimens, and models. Schedule of the assessments planned for the entire year has also been highlighted along with the mark's distribution for the professional examinations. A list of reference books and reading material is also included at the end of the guide. We hope that this guide helps provide the students with valuable guidance.

Prof. Dr. Nausheen Raza
MBBS, M. Phil
Professor & HOD of Anatomy Department
SMDC, Lahore
Date: 28-01-2023

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PLANNED TEACHING ACTIVITIES FOR 2nd YEAR MBBS DEPARTMENT OF ANATOMY

In the MBBS course program, PMDC has assigned 250hours to the subject of Anatomy. To help students make the most of their day, these hours are distributed among numerous modes of information transfer (MIT). These MITs are intended to assist students to correlate normal anatomical structures to their clinical importance macroscopically, microscopically, and developmentally, since the study of anatomy sections of gross anatomy, histology, general anatomy, and embryology.

Lectures

The total number of hours allotted for lectures has been divided across the embryology, Neuroanatomy and histology sections, totaling 63 hours. The Professor, Associate Professors, and Assistant Professors will deliver these lectures. The students are directed to take notes during the lectures and are encouraged to participate actively. The lecturer will list the objectives of the lecture at the start so that the students can know how to focus study from the recommended books.

Practical classes

The 2nd year MBBS class of 100 students is divided into 4 batches of 25 students each. Each batch has one practical class every week, focused on histology. The class is 2 hours long and the students are taught one component of normal human histology each week. The class is conducted by a demonstrator under the supervision of a senior instructor. The students are given an introduction about the tissue under study and are then instructed to observe the slides under a microscope. The attendance of the day is marked after a student correctly draws the slide on his/her practical notebook and gets it checked by the instructor.

Small-Group Discussions (SGDs)

SGDs are scheduled four times a week and consist of various activities such as dissection, demonstrations of dissected specimens and models, presentations, assignments, and classes of gross anatomy. These are conducted in 3batches, and each is assigned a demonstrator. All 3 batches are supervised by an Assistant Professor or Associate Professor. The students are directed to dissect cadavers and observe the dissected specimens to grasp the knowledge of the normal gross anatomy structures, bones, and radiology.

Self-directed learning

In the self-directed learning time, scheduled twice a week, the students are divided into 2 batches and allocated a classroom or library where they can catch up on assignments and ask for their teacher's assistance if required. This encourages group study practices as well.

TRAINING PROGRAM FOR DEPARTMENT OF ANATOMY 2nd YEAR MBBS CLASS

Schedule of Special Embryology Lectures MBBS 2nd Year Class (Session 2023-2024)

Sr. No	Topics
1.	Spinal Cord
2	Spinal Cord, Clinical Correlate
3	Hind Brain, Midbrain
4	Fore Brain
5	Clinical Correlate
6	Peripheral & Autonomic Nervous System
7	Eye
8	Eye
9	Ear
10	Ear
11	Pleuropericardial and pleuroperitoneal membranes
12	**Test - I CNS, Eye, Ear**
13	Diaphragm
14	Diaphragm - developmental defects
15	Larynx, Trachea
16	Lungs
17	Pharyngeal Arches
18	Pharyngeal Pouches, Congenital Malformations
19	Thyroid and Salivary Glands
20	Tongue
21	Face
22	Face, Nasal Cavity, Paranasal Sinuses
23	Palate
24	Palatal Abnormalities
25	**Test – II Pharyngeal Apparatus Body**

	Cavities & Respiratory system
26	Heart Tube
27	Sinus Venosus, Atria
28	Ventricles, Bulbus cordis
29	Truncus Arteriosus
30	Valves, Conducting System, Congenital Anomalies
31	Congenital Anomalies
32	Arteries
33	Arteries
34	Veins
35	Veins
36	Fetal Circulation
37	Foregut, Esophagus
38	Stomach
39	**Test – III CVS**
40	Omental bursa, Duodenum
41	Liver, Pancreas, Spleen
42	Midgut
43	Caecum, Appendix, Congenital Malformations
44	Hind Gut
45	Congenital Malformations
46	Genitourinary System, Pronephros
47	Mesonephros
48	Metanephros
49	Urinary Bladder, Urethra
50	Paramesonephric Ducts
51	Uterus
52	Vagina, Prostate
53	Gonads – Testis

54	Ovaries, Mesonephric Ducts
55	External Genitalia
56	Congenital Malformations
57	Inguinal Canal, Descent of Gonads
58	**Test – IV GIT, Genitourinary system**

Facilitator:

Prof. Dr. Nausheen Raza

Dr. Waqas Iqbal

Schedule for Histology 2nd Year MBBS Session 2023-2024

Sr. No	Lecture Topics
1.	Introduction to special senses, Eyelid
2	Eyeball
3	Ear
4	Ear
5	Introduction – Oral Cavity
6	Esophagus
7	Stomach
8	Small Intestine
9	Large Intestine
10	Salivary glands
11	Liver
12	Gall bladder, Pancreas
13	Kidney
14	Ureter, Urinary bladder
15	Testis
16	Duct system
17	Male Urethra
18	Glands (Seminal vesicle, Prostate& Urethral Glands)
19	Ovary
20	Fallopian tubes, Uterus
21	Cervix, Vagina, Female Urethra
22	Urethra
23	Pituitary Gland, Pineal gland
24	Adrenal Gland
25	Thyroid & Parathyroid Gland
26.	**Test I CNS, Special Senses**

27.	**Test II GIT**
28.	**Test III Urinary System, Male &Female reproductive system, Endocrine System**

Facilitators:

Prof. Dr. Tasneem A. Raza

Dr. Ammara Ghafoor

Schedule of Neuroanatomy Lectures MBBS 2nd Year Classes

Sr. No	**Topic Lecture**
1	Receptors, Effectors
2	Nerve Fiber & Classification, Typical Spinal Nerve, Reflex arc, Brain Barriers
3	Spinal Cord I, Ascending tracts
4	Spinal Cord I, Descending tracts
5	Clinical Correlates Spinal Cord
6	Special Sensory Pathways
7	Autonomic nervous system
8	**Test**

Facilitator:

Dr. Waqas Iqbal

Gross Anatomy

Head & Neck Teaching Schedule for 2nd Year MBBS (2023-2024)

Sr. No	Topic
1.	Introduction to skull, Sex differences, Norma verticalis, Norma occipitalis
2	Norma frontalis
3	Norma lateralis& Temporal Fossa
4	Scalp, Blood supply, Nerve supply & Lymphatic's of scalp
5	Mandible
6	Muscle of face, Eyelid
7	Blood Supply, Nerve Supply & Lymphatic drainage of face
8	Parotid gland & its nerve supply, Otic ganglion
9	Carotid Sheath & its contents
10	**1st Substage (Viva)**
11	Muscles of mastication & Mandibular nerve
12	Temporomandibular joint & Clinical correlates
13	Pterygopalatine fossa and Ganglion
14	Maxillary Artery & Nerve
15	Cranial Cavity
16	Cranial Cavity
17	Meninges, Sub-Arachnoid granulations Sub-Arachnoid Cistern
18	Dural venous sinuses, Emissary veins
19	Dural venous sinuses, Hypophysis cerebri
20	**2nd Substage (Written)**
21	Bony Orbit & Its Contents
22	Eyeball, 2nd Cranial nerve & testing
23	Extraocular muscles, 3rd, 4th& 6th Cranial nerves &testing
24	Deep cervical fascia, Lacrimal apparatus
25	Ophthalmic nerve & vessels, Ciliary ganglion
26	Sternocleidomastoid & Triangles of neck
27	Triangles of neck, 11th Cranial nerve
28	**3rd Substage (Written)**

29	Cervical vertebrae & its joints, Vertebral artery
30	Hyoid bone, Supra &infrahyoid muscles
31	Prevertebral muscles & Scalene muscles
32	Cervical plexus & Cervical Sympathetic Trunk
33	Norma basalis
34	Norma basalis
35	Thyroid, parathyroid & Thymus gland
36	Subclavian artery, Venous and lymphatic drainage of the neck
37	Submandibular gland, Sublingual gland & Submandibular ganglion
38	Nasal cavity, Nasal septum
39	Paranasal sinuses, 1st C.N
40	Oral cavity, soft palate and its muscles
41	**4th Substage (Viva)**
42	Pharynx
43	Pharynx
44	Larynx
45	Larynx, 10th Cranial nerve
46	Tongue and 12th Cranial nerve
47	External ear, Auditory tube, Tympanic membrane
48	Middle ear
49	Internal ear and 8th Cranial nerve
50	7th Cranial nerve & its lesions
51	**5th Substage (OSPE)**
52	Radiology, Surface Anatomy
53	**Stage (Written)**
54	**Stage (OSPE/Viva)**
55	**Stage (OSPE/Viva)**

Facilitator:

Batch A: Dr. Ammarah Ejaz

Batch B: Dr. Waqas Iqbal

Batch C: Dr. Abu Usama

Brain Teaching Schedule for 2nd Year MBBS (2023-2024)

Sr. No	Topic
1.	Introduction to brain and spinal cord, Interpeduncular fossa
2	Spinal cord external features and grey matter, Spinal cord ascending tracts
3	Spinal cord ascending tracts
4	Spinal cord descending tracts
5	Spinal cord descending tracts
6	Clinical correlates of Spinal cord, Blood Supply of Spinal Cord
7	Medulla oblongata
8	Pons, Midbrain
9	Midbrain, Blood supply of Mid brain & Hind brain
10	Cerebellum
11	Cerebellum
12	**1st Substage (Written)**
13	Cerebrum gross features
14	White matter of cerebrum
15	Cortical areas & their relation to blood supply & applied
16	Cortical areas & their relation to blood supply & applied
17	Internal Capsule
18	Thalamus & Thalamic connections
19	Epithalamus, Metathalamus, Subthalamus
20	Hypothalamus
21	Lateral Ventricle
22	Third ventricle, 4th Ventricle, CSF & its circulation
23	Blood Supply of Brain
24	Blood Brain barrier, Blood CSF barrier
25	Basal ganglia
26	Limbic system
27	Reticular System

28	**Substage II (Viva)**
29	**Stage OSPE**
30	**Stage Written**
31	**Stage Viva**

Facilitator:
Batch A: Dr. Abu Usama
Batch B: Dr. Ammarah Ejaz
Batch C: Dr. Waqas Iqbal

Abdomen & Pelvis Teaching Schedule for 2nd Year MBBS (2023-2024)

Sr. No	Topic
1.	Abdominal Wall (Planes & Divisions), its Neurovascular Supply, Incisions
2	Rectus Sheath
3	Inguinal Canal, Superficial and Deep Inguinal Rings,Inguinal Hernias
4	Peritoneum
5	Peritoneum, Special Peritoneal Regions
6	Esophagus Abdominal part, Coeliac trunk
7	Stomach
8	Small Intestines
9	Cecum, Appendix, Large Intestine
10	Pancreas, Autonomic Nervous System
11	Spleen
12	Liver
13	Gall Bladder, Biliary tract
14	Portal vein, Portosystemic junctions
15	**1st Substage (Written)**
16	Kidney
17	Abdominal part of Ureters, Suprarenal Glands
18	Inferior Vena Cava, Abdominal Aorta
19	Lumbar plexus, Lumbar Vertebrae, Intervertebral Joints
20	Sacrum, Posterior Abdominal Wall

21	Lumbosacral and Sacroiliac Joints, Pubic Symphysis
22	Bony Pelvis, Pelvis-Sex differences
23	**2nd Substage (OSPE)**
24	Pelvic mechanism, Pelvic Diaphragm
25	Ovaries, Uterine Tubes
26	Uterus
27	Vagina
28	Pelvic part of Ureter, Urinary Bladder
29	Prostate, Male Urethra, Seminal Vesicles
30	Rectum, Anal Canal,
31	Sacral plexus, Lymph nodes &Vessels of Pelvis
32	**3rd Substage (Viva)**
33	Perineum, Urogenital region,
34	Pudendal Canal, Pudendal vessels and nerves
35	Superficial and Deep Perineal pouches
36	Anal region
37	Ischiorectal fossa
38	Female &Male External Genitalia
39	Surface marking and radiology
40	**4th Substage (Viva)**
41	**Stage OSPE**
42	**Stage Written**
43	**Stage Viva**

Facilitator:

Batch A: Dr. Waqas Iqbal

Batch B: Dr. Abu Usama

Batch C: Dr. Ammarah Ejaz

Schedule for Histology Practical 2nd Year MBBS

Sr. No	Practical
1.	Peripheral Nerve, Ganglia, Spinal cord
2	Cerebrum, Cerebellum
3	Eye
4	Eye
5	Pinna
6	Lip
7	Tongue
8	Esophagus
9	Stomach
10	Small Intestine
11	Colon, Appendix
12	Rectum, Anal Canal
13	Salivary Glands
14	Liver
15	Gall bladder, Pancreas
16	Kidney
17	Ureter, Urinary bladder
18	Testes
19	Ductus deference, Epididymis
20	Prostate gland, Seminal Vesicle
21	Ovary
22	Fallopian tube
23	Uterus, Cervix
24	Vagina, Mammary Gland
25	Pituitary gland
26	Adrenal gland
27	Thyroid and Parathyroid gland

Facilitators:

Dr. Ammara Ghafoor
Dr. Qirrat Hameed
Dr. Rabbya Naseem

LIST OF TOPICS IN THE SUBJECT OF ANATOMY AND THEIR LEARNING OBJECTIVES

Special Embryology

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Development of Pharyngeal Apparatus:	**Knowledge** ➢ Enumerate the components of pharyngeal apparatus and list derivatives of each (arch, cleft, pouch and membrane). ➢ Describe the development of tongue, thyroid gland and thymus. ➢ Describe the development of face, Nasal cavity and palate. ➢ Discuss different congenital malformation related to the development of aforementioned.	**LGIS (Large group interactive session)**
Development of Body Cavities and Diaphragm	**Knowledge** ➢ Discuss the development of the body cavities, mesenteries and diaphragm. ➢ Discuss the congenital anomalies related to these structures.	**LGIS (Large group interactive session)**
Development of Digestive System	**Knowledge** ➢ Describe the development of gastrointestinal tract (fore-gut, mid-gut and hind-gut). ➢ Explain the development of liver, pancreas, spleen and gall bladder. ➢ Discuss different congenital malformation related to the development of aforementioned.	**LGIS (Large group interactive session)**
Respiratory System:	**Knowledge** ➢ Describe the development of upper and lower respiratory passages. ➢ Discuss the stages of lung maturation. ➢ Discuss trachea-esophageal fistula and respiratory distress syndrome.	**LGIS (Large group interactive session)**
Cardiovascular System:	**Knowledge** ➢ Describe the development of heart, aorta, aortic arches, superior and inferior vena cava and portal	**LGIS (Large group interactive**

	vein. ➢ Describe the fetal circulation and changes in circulation taking place at birth. ➢ Discuss the congenital anomalies of cardiovascular system.	**session)**
Development of Urinary System	**Knowledge** ➢ Describe the development of kidneys, ureters, urinary bladder and urethra. ➢ Discuss congenital malformations related to these structures.	**LGIS (Large group interactive session)**
Development of Genital System	**Knowledge** ➢ Describe the development of testes, epididymis, vas deferens, seminal vesicles and prostate. ➢ Describe the development of the ovaries, uterus and vagina. ➢ Describe the development of male and female external genital organs. ➢ Discuss the congenital abnormalities related to these structures.	**LGIS (Large group interactive session)**
Development of Nervous System:	**Knowledge** ➢ Enumerate the brain vesicles& describe their development and enlist their derivatives. ➢ Describe the development of spinal cord. ➢ Enumerate the derivatives of neural crest cells. ➢ Discuss the development of autonomic nervous system. ➢ Discuss the congenital malformations of the nervous system.	**LGIS (Large group interactive session)**
Development of Ear	**Knowledge** ➢ Explain the development of external, middle and internal ear. ➢ Describe the congenital abnormalities of each.	**LGIS (Large group interactive session)**
Development of Eye	**Knowledge** ➢ Describe the development of lacrimal apparatus, eyeball and optic nerve. ➢ Discuss the congenital abnormalities related to eyeball.	**LGIS (Large group interactive session)**

Special Histology

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Digestive System:	**Knowledge** ➢ Define the epithelium lining the oral cavity, tongue, gums, hard and soft palate, pharynx and lips ➢ Discuss the histological structure of tongue, esophagus, stomach, small intestine, large intestine, appendix and anal canal. Explain the transition in epithelial lining relative to their functions. ➢ Describe the histological structure of salivary glands, Liver, Pancreas and Gall Bladder in the light of their functionality. **Skill** ➢ Identify, draw and label light microscopic diagram of lip, tongue,esophagus, stomach, small & large intestine, liver, gallbladder, pancreas and salivary glands.	**LGIS (Large group interactive session)** **LAB**
Urinary System:	**Knowledge** ➢ Describe the histological structure of kidney, ureter, urinary bladder and urethra **Skill** ➢ Identify, draw and label light microscopic diagram of kidney, ureter, urinary bladder.	**LGIS (Large group interactive session)** **LAB**
Male Reproductive System:	**Knowledge** ➢ Describe histological structure of testis, epididymis, vas deferens, seminal vesicle and prostate and relate it to their functions. **Skill** ➢ Identify, draw and label light microscopic diagram of testes,epididymis, vas deferens, seminal vesicle & prostate.	**LGIS (Large group interactive session)** **LAB**
Female Reproductive System:	**Knowledge** ➢ Describe histological structure of ovaries, fallopian tube, uterus and vagina. Explain their functions related to their structure. **Skill** ➢ Identify, draw and label light microscopic diagram of	**LGIS (Large group interactive session)** **LAB**

	ovary, fallopian tube, uterus, vagina & cervix**.**	
Endocrine System:	**Knowledge** ➢ Describe the histological structure and functions of Pituitary, Thyroid, Parathyroid Adrenals and Islets of Langerhans. **Skill** ➢ Identify, draw and label light microscopic diagram of pituitary gland, adrenal gland, thyroid & parathyroid glands.	**LGIS (Large group interactive session)** **LAB**
Eye	**Knowledge** ➢ Describe the histological structure of various layers of eyeball with emphasis on cornea and retina and give their functions **Skill** ➢ Identify, draw and label light microscopic diagram of eyelid, cornea & retina.	**LGIS (Large group interactive session)** **LAB**
Ear:	**Knowledge** ➢ Describe the histological structure of external, middle and internal ear in detail; correlate their functions to the structure **Skill** ➢ Identify, draw and label light microscopic diagram of pinna.	**LGIS (Large group interactive session)** **LAB**

Head & Neck

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Skull **Norma verticalis, frontalis, lateralis, occipitalis,basalis** **Cranial Cavity**	**Knowledge** ➢ Describe the bones forming the anterior, superior, lateral, posterior and basal view of skull on the given bone. ➢ Describe the bones forming the boundaries of orbit, nasal cavity and oral cavity and mark their boundaries. ➢ Describe the bones forming the cranial cavity. **Skill** ➢ Mark the main anatomical landmarks on Normaoccipitalis, verticals, lateralis, frontalis&basalis. ➢ Identify the boundaries of temporal, infratemporal fossa and pterygopalatine fossa on the given bone. ➢ Identify the boundaries of anterior, middle & posterior cranial fossa and structures passing through various foramina.	**SGD(Small group discussion)/ Demo**
Scalp	**Knowledge** ➢ Describe layers of scalp. ➢ Describe the course of arteries, veins and nerves supplying the scalp with the help of model. ➢ Describe the danger area of the scalp **Skill** ➢ Identify the course of arteries, veins and nerves supplying the scalp with the help of model & specimen.	**SGD/ Demo**
Face	**Knowledge** ➢ Describe the anatomy of muscles of face along with their nerve supply with the help of models. ➢ Describe the course of arteries, veins and nerves supplying the face with the help of model. ➢ Describe the features of facial infections and cavernous sinus thrombosis. **Skill** ➢ Identify the course of arteries, veins and nerves supplying the face with the help of model & specimen.	**SGD/ Demo**
Trigeminal nerve **Facial nerve**	➢ Trace the pathway of trigeminal nerve from nucleus to target organs ➢ Enumerate the divisions of trigeminal nerve ➢ Describe the features of trigeminal neuralgia ➢ Describe the pathway of mandibular nerve from nucleus to target organs	**SGD/ Demo**

	➢ Describe the pathway of maxillary nerve from nucleus to target organs ➢ Describe the lesions of nerves with special reference to infections of molar teeth ➢ Describe the course of facial nerve in face ➢ Enumerate its branches ➢ Discuss the involvement of nuclei of facial nerve in bell palsy ➢ Differentiate between upper and lower motor neuron lesions	
Salivary gland	**Knowledge** ➢ Enumerate salivary glands ➢ Describe the locations of major salivary glands **Skill** ➢ Trace the secretomotor nerve supply of major salivary glands ➢ Describe the structures involved in parotid infections	**SGD/ Demo**
Temporo-mandibular joint	**Knowledge** ➢ Name the ligaments of TMJ. ➢ Describe the movements of jaw at TMJ with special reference to axis and muscles producing them. ➢ Describe the clinical signs of anterior dislocation of TMJ and explain the steps of its reduction. **Skill** ➢ Identify the type of TMJ. ➢ Identify the articular surfaces of TMJ on a given model or dry bones.	**SGD/ Demo**
Infra-temporal region	**Knowledge** ➢ Enlist the structures forming various boundaries of infratemporal fossa. ➢ Enlist the communications of infratemporal fossa and the structures traversing each. ➢ Enumerate the contents of infratemporal fossa. Discuss the relationships of various contents of infratemporal fossa. ➢ Discuss the attachments, actions and nerve supply of muscles of mastication. **Skill** ➢ Identify the location of infratemporal fossa on a given model and skull.	**SGD/ Demo**
Deep cervical fascia	**Knowledge** ➢ Enumerate the layers of deep cervical fascia ➢ Describe the attachments of investing, pretracheal, and prevertebral layers of fascia	**SGD/ Demo**

	➢ Describe the modification of prevertebral layer into axillary sheath ➢ Describe the formation of carotid sheath and its contents ➢ Describe the spaces within fascia ➢ Describe the clinical significance of retropharyngeal space ➢ Describe the relation of layers of fascia and spread of infection ➢ Describe the significance of merging of carotid sheath with pretracheal layer of fascia to prevent spread of infections	
Neck:	**Knowledge** ➢ Describe the muscles of neck along with their nerve supply with the help of models ➢ Describe the features of torticollis ➢ Enumerate triangles of neck ➢ Describe the muscles forming the boundaries of triangles ➢ Describe the contents of triangles and their importance ➢ Describe the lesions of the spinal accessory nerve in posterior triangle ➢ Enumerate the main vessels in neck & describe the course and branches of main vessels of neck ➢ Describe the importance of monitoring jugular venous pulse in heart diseases ➢ Enumerate causes of prominence of external jugular vein **Skill** ➢ Trace the course of glossopharyngeal nerve, vagus nerve, accessory nerve and hypoglossal nerve on the given model, from nucleus to target organs. ➢ Enumerate branches of each of the above nerve	**SGD/ Demo**
Oral cavity	**Knowledge** ➢ Enumerate the vessels and verves supplying the oral cavity. ➢ Discuss clinical correlations of oral cavity. Identify structures forming the boundaries of oral cavity. Identify structures in the floor of oral cavity with the help of models. **Skill** ➢ Identify the structures forming the boundaries of oral vestibule.	**SGD/ Demo**

Palate	**Knowledge** ➢ Enumerate muscles of soft palate on the model ➢ Enumerate blood supply and nerve supply of soft palate **Skill** ➢ Identify the main features of hard palate and soft palate. ➢ Identify the main muscles forming the palatoglossal and palatopharyngeal arches	**SGD/ Demo**
Tongue	**Knowledge** ➢ Describe the gross features of parts of tongue ➢ Describe the blood supply, nerve supply, lymphatic drainage of tongue ➢ Describe the movements of tongue	**SGD/ Demo**
Pharynx	**Knowledge** ➢ Describe the following parts of pharynx on the given model • Oropharynx • Nasopharynx • Laryngopharynx ➢ Describe muscles of pharynx ➢ Describe lymphoid tissue in the pharynx ➢ Describe the importance of structures passing through the spaces between muscles of pharynx while performing tonsillectomy ➢ Describe spread of infections from nasopharynx to middle ear ➢ Enumerate the main nerves in neck **Skill** ➢ Trace the course of glossopharyngeal nerve, vagus nerve, accessory nerve and hypoglossal nerve on the given model, from nucleus to target organs. ➢ Enumerate branches of each of the above nerve	**SGD/ Demo**
Lymphatic drainage of Head &Neck	**Knowledge** ➢ Enumerate the groups of lymph of nodes draining the neck ➢ Describe their location and areas of drainage ➢ Describe the formation of jugular lymph trunk ➢ Describe the clinical importance of lymphatic drainage of head and neck	**SGD/ Demo**
Larynx	**Knowledge** ➢ Explain the gross features of inlet of larynx, piriform fossa, laryngeal folds, cavity of larynx ➢ Correlate the laryngeal anatomy to foreign bodies	**SGD/ Demo**

	aspiration ➢ Explain the gross features of intrinsic muscles of larynx, extrinsic muscles of larynx, movements of vocal folds ➢ Describe the cartilage involvement in fractures of the laryngeal skeleton **Skill** ➢ Identify the gross features of • cartilages of larynx • membranes of larynx • Trace the course of following nerves of larynx • Internal laryngeal nerve • External laryngeal nerve • Inferior laryngeal nerve	
Ear Vestibulo-cochlear nerve	**Knowledge** ➢ Describe the gross anatomical features of external ear Auricle External auditory meatus ➢ Describe the blood supply, nerve supply and lymphatic drainage of external ear. ➢ Correlate the significance of straightening the auditory canal during clinical examination with the anatomical structure of canal. ➢ Describe the gross anatomical features of middle ear ➢ Describe the structures forming the walls of middle ear cavity on the given model ➢ Describe the contents of middle ear cavity **Skill** ➢ Identify the parts of ear ossicles on the given model **Knowledge** ➢ Describe the muscles present in middle ear cavity ➢ Describe the gross features of auditory tube ➢ Describe the nerve supply of auditory tube ➢ Discuss the clinical correlates related with ear **Skill** ➢ Identify the parts of bony labyrinth on the given model ➢ Identify the parts of membranous labyrinth on the given model ➢ Identify the parts of cochlea of semi-circular canal on the given model. **Knowledge** ➢ Describe the gross features of bony labyrinth ➢ Describe the gross features of membranous labyrinth ➢ Describe the orientation of semicircular canals and ducts within the inner ear	**SGD/ Demo**

	➢ Describe the gross features of internal acoustic meatus ➢ Describe anatomical structures involved in perforation of tympanic membrane ➢ Discuss the consequences of damage to vestibulocochlear nerve **Skill** ➢ Trace the course of vestibulocochlear nerve in the inner ear on the given model ➢ Identify the area of supply of vestibular nerve on the given model ➢ Identify the area of supply of cochlear nerve ➢ Identify the gross features of vestibulocochlear ganglion on model	
Orbit Extraoccular muscles Occulomotor, Trochlear &Abducent nerves	**Knowledge** ➢ Describe the bony orbit ➢ Enlist the structures present in the orbit ➢ Describe gross features of eye lids ➢ Describe the attachment of muscles of eyelid ➢ Describe the attachment of orbital septum ➢ Describe the distribution of Blood Vessels and Lymph Vessels of the Orbit ➢ Describe the anatomical structures involved Inflammation of the Palpebral Glands ➢ Describe the extraocular muscles of eye ➢ Describe the movements of eyeball ➢ Correlate the anatomical lesions in nuclei of nerve supplying the extraocular muscles with the loss of function in muscles ➢ Describe the origin course and distribution of occulomotor, trochlear and abducent nerves.	**SGD/ Demo**
Lacrimal apparatus	**Knowledge** ➢ Enumerate the structures forming lacrimal apparatus ➢ Describe the gross features of each part of lacrimal apparatus ➢ Describe the nerve supply of lacrimal apparatus ➢ Discuss its clinical applied.	**SGD/ Demo**
Eyeball Optic nerve	**Knowledge** ➢ Describe the coats and parts of eyeball and discuss the blood supply and verve supply of eyeball ➢ Describe the formation of olfactory bulb and optic tract **Skill** ➢ Trace the pathway of optic nerve from nucleus to target organs	**SGD/ Demo**

Nose Olfactory nerve	**Knowledge** ➢ Describe the structure of external nose and nasal cavity ➢ Describe the concha and meatus in the lateral wall ➢ Enumerate the sinuses opening in them ➢ Discuss anatomical structures involved in nasal fractures ➢ Correlate the anatomical structure of nasal mucosa with clinical manifestations of rhinitis **Skill** ➢ Trace the pathway of Olfactory nerve form nucleus to target organs on a model	**SGD/ Demo**
PaParanasal sinuses	**Knowledge** ➢ Describe the gross features of paranasal sinuses ➢ Describe infections of sinuses ➢ Describe the Drainage of mucus in relation to sinusitis ➢ Describe the Function of Paranasal Sinuses ➢ Discuss the anatomical structures involved in sinusitis with special reference to clinical consequences of infections of the ethmoidal cells of the ethmoidal sinuses	**SGD/ Demo**
Cranial nerves	**Knowledge** ➢ Discuss the intracranial and extra cranial course of all cranial nerves ➢ Discuss clinical correlations and examination of all cranial nerves.	**SGD/ Demo**
Imaging of Head & Neck	**Skill** ➢ Identify the bones forming skeleton of head on radiograph ➢ Identify boundaries of orbit &paranasal sinuses on radiograph	**SGD/ Demo**
Surface Marking	**Skill** ➢ Mark the main vessels of head & neck on the given subject	**SGD/ Demo**

Brain & Neuroanatomy

Topic	**Learning Objectives** Students should be able to:	**MIT (Mode of information transfer)**
Introduction to Nervous System	**Knowledge** ➢ Describe the divisions of the nervous system and their components and briefly describe how they function. ➢ Enumerate structures within spinal and cranial cavities	**SGD(Small group discussion)/**

	➢ Define ventricles and CSF. ➢ Define coverings of brain and spinal cord.	**Demo**
Meninges & venous sinuses of Brain	**Knowledge** ➢ Identify meninges of brain on the given model ➢ Describe the dural reflections with special emphasis on tentorium cerebelli and falxcerebri. ➢ Explain the features of spaces within meninges. ➢ Define Meningitis ➢ Explain the structures encountered during lumbar puncture ➢ Enumerate the nerves and blood vessels supplying the meninges. ➢ Describe the attachments of meninges with the help of dissection ➢ Demonstrate the supratentorial and infratentorial compartments of tentorium cerebelli with the help of dissection. ➢ Describe the extradural and subdural hematoma. ➢ Explain the attachments of dural venous sinuses of brain with the help of diagrams ➢ Describe the important relations with the help of diagrams ➢ Discuss the importance of facial vein connection with dural venous sinuses.	**SGD/ Demo**
Structure of spinal cord, ascending & descending tracts of spinal cord	**Knowledge** ➢ Describe the structure of spinal cord ➢ Describe the structure of gray matter and white matter in spinal cord. ➢ Enumerate the major ascending and descending tracts of spinal cords. Describe the pathways for superficial and deep sensations. ➢ Describe the effects of lesions of section of spinal cord ➢ Outline the pathways of voluntary movements ➢ Describe the location of first ,second and third order neurons	**SGD/ Demo**
Structure of Brainstem	**Knowledge** ➢ Describe gross features of medulla on a given model ➢ Describe the internal structure of medulla with the help of different cross sections ➢ Correlate the significance of raised pressure in posterior cranial fossa to its effects on medulla oblongata ➢ Discuss nuclei of cranial nerves present in medulla. ➢ Describe clinical correlations of medulla	**SGD/ Demo**

	➢ Explain the internal structure of Pons with cross sections at different levels ➢ Discuss nuclei of cranial nerves lying in pons. ➢ Discuss the anatomical structures involved in Pontine hemorrhage ➢ Describe the internal structure of midbrain with cross sections at different levels ➢ Discuss nuclei of cranial nerves lying in midbrain. ➢ Enumerate the clinical consequences of trauma to midbrain **Skill** ➢ Identify the gross features of medulla, pons & midbrain on a given model & specimen.	
Cerebellum	**Knowledge** ➢ Describe the gross features of cerebellum on the given model ➢ Explain the cerebellar nuclei and their connection with other parts of brain. afferent fibers and efferent fibers ➢ Discuss the effect of lesions of cerebellum on voluntary movements	**SGD/ Demo**
Cerebrum	**Knowledge** ➢ Correlate the anatomical lesions of nuclei of thalamus and hypothalamus with the clinical conditions like diabetes insipidus and obesity ➢ Describe the features of telencephalon & diencephalon parts of following on a given model. **Skill** ➢ Identify the gross features of thalamus & hypothalamus.	**SGD/ Demo**
Reticular formation & limbic system	**Knowledge** ➢ Discuss reticular formation and its afferent and efferent projections ➢ Describe functions of reticular formation ➢ Discuss components of limbic system ➢ Discuss connecting pathways of the limbic system ➢ Discuss afferent and efferent pathways of hippocampus ➢ Discuss clinical correlations of reticular formation and limbic system	**SGD/ Demo**
Basal nuclei	**Knowledge** ➢ Discuss corpus striatum and its nuclei ➢ Discuss their connections, direct and indirect pathway ➢ Discuss clinical correlations of basal nuclei ➢ Discuss parkinsonism in detail	**SGD/ Demo**

Cerebrum	**Knowledge** ➢ Describe the gross features of the lobes of cerebrum. ➢ Explain the phenomenon of cerebral dominance ➢ Discuss clinical correlations of cerebral cortex ➢ Discuss the effects of lesions in the Motor cortex on voluntary movements and speech. ➢ Discuss the effect of lesion in the Frontal eye field in relation to personality change. Classify the cerebral fibers of according to their connections. ➢ Describe the fibers present in the brain. ➢ Explain the effects of lesions of different parts of internal capsule **Skill** ➢ Identify the main sulci and gyri of cerebral hemispheres on the given model ➢ Identify the location of major sensory and motor areas within specific lobes with the help of dissection ➢ Identify the major sensory and motor areas of cortex with the help of dissection	**SGD/ Demo**
Blood supply of brainstem, spinal cord & cerebrum	**Knowledge** ➢ Describe the blood supply of different parts of brain ➢ Explain the formation and importance of circle of Willis with diagram ➢ Describe the blood supply of different parts of cerebrum	**SGD/ Demo**
Imaging of CNS	**Knowledge& Skill** ➢ Describe the appearance of different parts of brain in ➢ Normal radiographs ➢ MRI ➢ CT scan	**SGD/ Demo**
Ventricles of brain	**Knowledge** ➢ Enumerate ventricles of brain ➢ Describe the relations and boundaries of each ventricle ➢ Describe the formation of choroid plexus ➢ Explain the process of production and absorption of CSF by arachnoid villi ➢ Explain the causes of overproduction and blockage of CSF ➢ Enumerate the varieties of hydrocephalus	**SGD/ Demo**

Abdomen & Pelvis

Topic	Learning Objectives Students should be able to:	MIT (Mode of information transfer)
Division of abdomen into regions and quadrants and their contents	**Knowledge** ➢ Describe the Division of abdomen into regions and quadrants ➢ Enlist the contents of abdominal regions.	**SGD(Small group discussion)/ Demo**
Anterior abdominal wall	**Knowledge** ➢ Describe the details of anterior abdominal wall. ➢ Identify the layers of abdominal wall. ➢ Identify the superficial and deep fascia and muscles of abdominal wall. ➢ Describe the formation of rectus sheath and its importance.	
Nerves of abdomen	**Knowledge** ➢ Describe nerve supply of anterior and posterior abdominal wall. ➢ Identify & create a visual representation of nerves supplying the abdomen. ➢ Sequence and categorize information on the segmental sympathetic supplies and referred pain. ➢ Explain the basic structure of paravertebral plexuses. ➢ Describe somatic nervous supply of abdomen	
Inguinal Canal	**Knowledge** ➢ Describe Walls of Inguinal Canal ➢ Describe Deep Inguinal Ring & Superficial Inguinal Ring ➢ Enlist Coverings of spermatic cord ➢ Explain Mechanics of the inguinal Canal ➢ Define hernia and describe its types ➢ Discuss Direct & indirect Inguinal Hernia ➢ Discuss Surface marking of inguinal canal **Skill** ➢ Identify Structures passing through inguinal canal	

Peritoneal Cavity & Peritoneal Relationships	**Knowledge** ➢ Define peritoneum ➢ Understand the different folds of peritoneum, i.e., peritoneal ligaments, omenta and mesenteries. ➢ Discuss the pouches, recesses and gutters formed by peritoneal infoldings. ➢ Describe greater and lesser sacs. ➢ Enlist the intraperitoneal and retroperitoneal viscera. ➢ Discuss vertical tracings of peritoneum. ➢ Describe arrangement of peritoneum in transverse section of male pelvis. ➢ Describe arrangement of peritoneum in transverse section of female pelvis. ➢ Discuss nerve supply of peritoneum. ➢ Discuss clinical correlates of peritoneum including peritoneal infection, peritoneal pain. ➢ Discuss the clinical importance of peritoneal cavity as dialyzing chamber.	
Posterior Abdominal Wall	**Knowledge** ➢ Describe muscles of posterior abdominal wall. **Skill** ➢ Identify structures forming posterior abdominal wall. ➢ Identify attachments of lumber fascia.	
Lymphatic Drainage of Abdomen	**Knowledge** ➢ Name the lymph nodes draining the abdomen ➢ Enlist the lymphatics draining the abdominal wall & the abdominal viscera. ➢ Describe the lymphatic trunks, cisterna chili & the thoracic duct. **Skill** ➢ Identify the terminal group of lymph nodes around abdominal aorta	
Lumbar Vertebrae	**Knowledge** ➢ Explain general characteristics of lumbar vertebrae including body and arch of lumbar vertebrae ➢ Describe processes like superior and inferior articular, transverse, spinous, mammillary accessory processes ➢ Describe first lumbar vertebra & fifth lumbar vertebra ➢ Discuss lumbar spinal stenosis	

Esophagus (abdominal part), stomach	**Knowledge** ➢ Explain gross features of abdominal part of esophagus & stomach. ➢ Name their peritoneal & visceral relations. ➢ Explain their blood supply, lymphatic drainage & nerve supply ➢ Describe achalasia, GERD and esophageal varices. ➢ Discuss gastric ulcer and its perforation, cancer of stomach and its lymphatic spread.	
Duodenum and pancreas	**Knowledge** ➢ Describe four parts of duodenum. ➢ Give their blood supply and venous drainage. **Skill** ➢ Identify duodenum. ➢ Identify the relations of different parts of duodenum.	
Small Intestine & large intestine (comparison of two)	**Knowledge** ➢ Describe the basic anatomy of small &large intestine. ➢ Explain the basic gross features which differentiate large intestine from small intestine. **Skill** ➢ Identify the important gross features of large intestine ➢ Identify the appendix on the basis of its distinguished features. **Knowledge** ➢ Give relations of small and large intestine. ➢ Describe the characteristics of ano-rectal regions ➢ Discuss the blood supply, nerve supply and venous and lymphatic drainage of small and large intestine. ➢ Discuss clinical correlates of small and large intestines and appendix. ➢ Discuss meckels diverticulum, resection of different parts of gut and its clinical effect ➢ Discuss clinical problems occurring due to occlusion of GIT blood vessels.	**SGD(Small group discussion)/ Demo**
Blood supply of Abdomen	**Knowledge** ➢ Describe the position and the vertebral levels of aorta in the abdomen. ➢ Enlist the main branches of the aorta and their territories. ➢ Explain the applied anatomy of the aorta. ➢ Describe the formation of inferior vena cava	**SGD/ Demo**

	➢ Enlist the tributaries of inferior vena cava ➢ Explain abdominal and thoracic relations of this vein ➢ Discuss clinical importance of inferior vena cava.	
Liver ,Gall bladder and biliary tract	**Knowledge** ➢ Describe the anatomical structure of liver& its relations. ➢ Give its blood supply lymph drainage and nerve supply. ➢ Discuss its clinical correlations. ➢ Describe the location, size, relation and blood supply of gallbladder. ➢ Explain differences between Intra & Extra Hepatic biliary systems. ➢ List different components of Extra-hepatic biliary System. **Skill** ➢ Identify lobes, surfaces and ligaments of liver. ➢ Identify bare area of liver on a model of liver. ➢ Identify the right & left hepatic ducts, common hepatic duct, cystic ducts, bile duct. **Knowledge** ➢ Describe clinical conditions related to gallbladder ➢ Describe the hepatic portal circulation. ➢ Explain the anatomy of hepatic vein. ➢ Describe the Portal-Caval anastomosis. ➢ Explain the clinical correlation of hepatic portal system	**SGD/ Demo**
Kidney	**Knowledge** ➢ Describe the gross features of kidney and its coverings ➢ Differentiate the anterior and posterior surfaces and relations of kidney. ➢ Describe the blood Supply& lymphatic draining of Kidney. ➢ Explain the Nerve supply of Kidney. ➢ Describe the course constrictions and relations of ureter. ➢ Discuss the blood supply and venous drainage of ureter. ➢ Give location and description of suprarenal glands ➢ Discuss their blood supply &lymph drainage and nerve supply. ➢ Give clinical correlations of kidney ureter and	**SGD/ Demo**

	suprarenal glands. **Skill** ➢ Identify the internal structure of kidney. ➢ Identify ureter, urinary bladder and urethra.	
Surface Marking	**Skill** ➢ Identify surface marking of stomach, spleen, liver, gall bladder, kidney & appendicular orifice. ➢ Identify the surface anatomy of kidney, ureter & urinary bladder. ➢ Perform the Surface anatomy of the kidney on human bony landmarks.	**SGD/ Demo**
Pelvis Bones and joints	**Knowledge** ➢ Define bony pelvis, true and false pelvis ➢ Describe surfaces of sacrum. ➢ Explain articulation. ➢ Differentiate between male and female sacrum. ➢ Enlist various types of joints of pelvis. ➢ Explain type, articulations, ligaments and relations of joints. ➢ Enlist factors providing stability to joint. ➢ Describe blood supply , nerve supply & movements of joint ➢ Differentiate the greater & lesser pelvis. ➢ Describe the superior & inferior circumference and their boundaries. ➢ Describe the anatomical position of pelvis. ➢ Differentiate the shapes of female pelvis regarding childbirth. ➢ Differentiate between male & female pelvis. **Skill** ➢ Identify muscles associated with sacrum.	**SGD/ Demo**
Pelvic diaphragm Vessels and nerve supply of pelvis	**Knowledge** ➢ Describe the anatomy of the pelvic walls. ➢ Discuss the muscles of pelvic floor and formation of pelvic diaphragm ➢ Develop an understanding of blood supply, nerve supply, and lymphatic drainage of muscles. ➢ Describe actions of pelvic diaphragm ➢ Describe sacral plexus. ➢ Identify coccygeal plexus. ➢ Describe pelvic hypogastric plexus. ➢ Discuss main arteries of pelvis common iliac artery external iliac artery internal iliac artery arteries of true pelvis.	**SGD/ Demo**

	➢ Describe main veins of the pelvis and their tributaries. ➢ Describe different groups of lymph nodes. ➢ Explain the role of lymphatics and common route and spread of malignancies of pelvis. **Skill** ➢ Identify pelvic nerves. ➢ Identify area of drainage of these veins.	
Sigmoid colon & rectum	**Knowledge** ➢ Describe sigmoid colon. ➢ Describe rectum. ➢ Explain relations, blood supply and innervation of these pelvic organs ➢ Discuss their important clinical correlations	**SGD/ Demo**
Urinary bladder	**Knowledge** ➢ Discuss urinary bladder, its peritoneal covering and internal structure. ➢ Discuss blood supply, venous drainage and lymph drainage of urinary bladder. ➢ Describe nerve supply and mechanism of micturition. ➢ Discuss clinical correlates of urinary bladder including urinary retention, difficulty with micturition after spinal cord injury, bladder injuries.	**SGD/ Demo**
Male genital organs	**Knowledge** ➢ Explain male genital organs, their structure, position, function and important relations ➢ Discuss vas deferens, seminal vesicle, and ejaculatory ducts. ➢ Give their blood supply and lymphatic drainage. ➢ Discuss prostate, its lobes and its relations. ➢ Describe its blood supply and lymphatic drainage. ➢ Discuss its clinical correlates including benign prostatic hyperplasia and CA prostate.	**SGD/ Demo**
Ovaries, fallopian tube & uterus	**Knowledge** ➢ Enumerate the clinical correlates of ovaries and uterine tubes. ➢ Explain the details of uterus, cervix and vagina. ➢ Enumerate the parts of uterus, ligaments, relations and support of uterus. ➢ Discuss the role of uterus in labour. **Skill** ➢ Identify ovaries and fallopian tubes.	**SGD/ Demo**

	➢ Describe the parts of ovaries and fallopian tubes. ➢ Identify the ligaments of ovaries. ➢ Identify the clinical correlates of uterus, cervix and vagina.	
Perineum	**Knowledge** ➢ Describe divisions of the perineum. ➢ Explain superficial and deep perineal pouch and their contents. ➢ Explain cutaneous nerves of the perineum. ➢ Define perineal body. **Skill** ➢ Identify borders and relations of the perineum.	**SGD/ Demo**
Anal canal	**Knowledge** ➢ Explain the gross anatomy of Anal Canal. ➢ Describe the blood supply, venous and lymphatic drainage of anal canal. ➢ Explain innervations of anal canal. ➢ Discuss clinical conditions of anal canal. ➢ Describe hemorrhoids and their types. ➢ Discuss perianal hematoma, fissure, abscess and fistula. ➢ Discuss incontinence after trauma and spinal cord injury. **Skill** ➢ Identify the relations of the anal canal with the surrounding structures.	**SGD/ Demo**
Ischiorectal fossa	**Knowledge** ➢ Describe the contents of ischiorectal fossa. ➢ Describe ischiorectal fossa infection. **Skill** ➢ Identify the boundaries and recessess of ischiorectal fossa .	**SGD/ Demo**
Testis	**Knowledge** ➢ Describe the coverings of testis. ➢ Recognize the internal features of testis. ➢ Explain the significance of pampiniform plexus. ➢ Justify the location of testis outside the body. ➢ Integrate the knowledge of descent of testis to its vessels, lymphatics and nerves. ➢ Recall the different clinical conditions associated with testis.	**SGD/ Demo**
Male Urogenital	**Knowledge** ➢ Describe gross anatomy of male external genitalia. ➢ Describe the gross structure of penis.	**SGD/ Demo**

Organ	➢ Explain its arterial, venous drainage & nerve supply. ➢ Describe scrotum and its walls. ➢ Discuss its blood supply and lymphatic drainage. ➢ Describe the nerve supply of anterior and posterior walls of scrotum. ➢ Explain anatomy of male urethra, its arterial, venous drainage & nerve supply. ➢ Discuss injury to different parts of male urethra and extravasation of urine	
Female Urogenital Organ	**Knowledge** ➢ Enlist the names and anatomical location of female external genitalia. ➢ Explain function, arterial supply, venous drainage and nerve supply of female external genitalia. ➢ Discuss clinical importance of female external genitalia. ➢ Explain course & relations of female urethra. ➢ Describe arterial supply, venous drainage and nerve supply of female urethra. ➢ Discuss clinical importance of female urethra.	**SGD/ Demo**

ASSESSMENT PLAN 2nd YEAR MBBS ANATOMY DEPARTMENT SMDC, LAHORE

The following modes of assessment are planned for 2nd year MBBS class in the subject of Anatomy. This plan has been designed keeping in view of the university curriculum and hopefully will facilitate the students in preparing for 2nd professional examinations in the subject.

Component Tests:

These will be conducted at the completion of every Component (/Embryology/Histology). The test will comprise of MCQs and SEQs on the pattern of university examinations.

Gross Anatomy Region Tests:

Gross Anatomy Regions are subdivided into substages followed by a final stage. The substages and stage will comprise of MCQs, SEQs, and OSPE & Viva on the pattern of university examinations.

Practical OSPE Tests:

In order to prepare the students for practical examinations at least two OSPE tests will be conducted on the pattern of university examinations.

Pre-annual Exam:

This will be undertaken in coordination with other departments, exactly following the format of university professional examinations. It will comprise of MCQs, SEQs, OSPE and Viva voce.

Internal Assessment:

Internal assessment will be calculated out of 20 based on all the tests that will be conducted throughout the year.

Distribution of Marks in the Subject of Anatomy

2nd Professional MBBS

Theory:

Internal Assessment	MCQs	SEQs	Total
10	45	45	100

Practical & Viva Voce:

Internal Assessment	Viva Voce	OSPE	Total
10	46	44	100

Practical & Viva Voce:

External & Internal Examiners 23 and 23 Marks each respectively.

OSPE:

Gross Anatomy Head & Neck, Brain, Abdomen & Pelvis, Radiological Anatomy & Embryology

1. Total No. of stations 12, each station will have 02 marks and 04 spots of identification.
2. Each station shall be given 1.5 min (18 minutes).
3. Total marks shall be 24.

Region	Station No	No of Spots	Marks
Head & Neck	1	04	02
	2	04	02
	3	04	02
Abdomen	4	04	02
	5	04	02
	6	04	02
Pelvis	7	04	02
Brain	8	04	02
	9	04	02
Radiological Anatomy	10	04	02
Embryology	11	04	02
	12	04	02

HISTOLOGY OSPE AND VIVA

1. There shall be 10 slides fixed on 10 microscopes.
2. They will move from one to the next slide in a predetermined direction.
3. For each station one minute shall be given, students will give point/points of identification for each slide.
4. Total number of identifications spots 10
    a. Each spot will be given 01 mark (0.5 marks for identification and 2 points of identification, 0.25 marks each
    b. Total marks allocated shall be: 10.
5. Time consumed shall be 10 min.
6. Long Slide of Histology: Identify, draw and label the slide in 15 minutes. Total marks for it shall be 10.

STAFF CONTACTS ANATOMY DEPARTMENT

Sr. No.	Name	Email address
1.	Prof. Dr. Nausheen Raza	nausheen410@gmail.com
2.	Prof. Dr. Tasneem Raza	asnimaamerraza@gmail.com
3	Dr. Ammara Ghafoor	nabeeha.shahid1507@gmail.com
4	Dr. Waqas Iqbal	drwaqasiqbal@gmail.com
5	Dr. Qirrat Hameed	qirrat55@gmail.com
6	Dr. Abu Usama	ususama59@yahoo.com
7	Dr. Ammarah Ejaz	ammarahejaz6@gmail.com
8	Dr. Rabbya Naseem	rabbyanaseem31@gmail.com

PRESCRIBED TEXTBOOKS & REFERENCES

RECOMMENDED BOOKS (Latest Edition):

1. Medical Histology by Prof. Laiq Hussain Siddiqui

2. Cunningham's Clinical Dissector

3. DiFiore atlas of Histology

4. Clinically Oriented Embryology by Keith L Moore

5. Clinically Oriented Anatomy by Keith Moore.

6. Cunningham's Manual of Practical Anatomy by G.J. Romanes, 15th Ed., Vol-I, II.

REFERENCE BOOKS

1. Clinical Anatomy by Snell.

2. Grant's Dissector of Anatomy.

3. Wheater's Functional Histology

4. Basic histology by Junqueira and Carniero

5. Grant's Atlas of Anatomy

Department of Physiology

PREFACE

Study Guide can make a major contribution to learning. They are sometimes likened to a tutor sitting on the student's shoulder-available 24 hours a day to advise the student what he/she should be doing at any stage in their study. Study guides are different from textbooks. They apprise the student at the beginning of an academic session about the course outline, the teaching methodology to be followed throughout the year, learning objectives of each academic activity and the assessment methodology to be followed in an academic session. At SMDC we follow the traditional annual academic schedule in which the subject of Physiology is taught in the 2nd academic year of a medical student. Keeping in view the mission of UHS, Lahore and vision of our institute we have designed a training program which is intensive and at the same time interesting for the young minds. This guide includes details about various teaching activities which are to take place throughout the academic year along with the time allocation of each. A list of lectures to be conducted in this session with names of the instructors is attached. A broad learning outcome of every section from the course accompanied by specific learning objective of every lecture is also included. A complete list of practical work to be carried out in the laboratory is part of this document. Details of various assessments and testing methodology are included and marks distribution for the subject in the 2nd Professional examinations has been given. Names and email contacts of faculty have also been mentioned to foster better interaction between the teacher and the taught. A list of prescribed text and reference books forms part of this study guide. Since this document is the first of its kind we intend to improve upon it in light of the student-feedback every year. We shall be focusing on integrating research and education and the fusion of technology and clinical care in endeavour to produce graduates who can provide cutting edge in healthcare. We shall imbibe in our students the highest values of medical ethics to be exemplary physicians who can be a source of enlightenment for others and be leaders in their fields.

Prof. Dr. Ghazal Mansoor
MBBS, M.Phil, Ph.D.
Head of Physiology Department SMDC, Lahore.
Date: 18-03-2023.

LIST OF CONTENTS

TIME ALLOCATION FOR ACADEMIC ACTIVITIES

Duration of 2ND Year MBBS Session: 36 Weeks

Total Teaching Hours (as required by PMC): 200

Topics	Subjects	Durations
LECTURES	06 Lectures per week Total Lectures (216) PBL (Problem Based Learning)	171 hrs
PRACTICALS	Practicals (02 hours per week)	72 hrs
TUTORIALS	SDGs (Small groups discussion) (1hr per week) Presentation & Assignments	36 hrs
Sendups		03 hrs
	TOTAL	**282**

PLANNED TEACHING ACTIVITIES FOR 2ND YEAR MBBS
DEPARTMENT OF PHYSIOLOGY

PMC has allocated 200 hours of teaching in the subject of Physiology for the 2nd Year MBBS course. In order to meet this requirement following teaching modules have been planned. These modules have been carefully designed to impart core knowledge of Physiology in a manner that an undergraduate student can grasp the subject fully and is adequately prepared for university examinations.

Lectures:
A total of 216 lectures are planned for the entire year. The lectures will be conducted by the Professors, Associate and Assistant Professors or by Senior Demonstrator in the subject of Physiology. The lectures will be interactive and students should actively participate in them to clear their doubts. Interactive lectures using multimedia, white-boards & Zoom application will introduce concepts, theories and application of the subject by using relevant examples. The students are required to take notes of the lectures and study the topic with the help of prescribed text books in light of the learning objectives of the topic enunciated by the teacher at the beginning of each lecture.

Class Activities (PBL):
Problems based learning classes will be conducted from time to time throughout the academic year. A clinical scenario with short history will be discussed at the end of relevant topics. Students are exposed to Group Discussion & Q/A Session with teachers in Small Group twice a month. During this time complex concepts and time practical application is further explained.

Practical classes:
Clinical important concepts are augmented by performing practicals in Physiology Lab. Like examinations of superficial and deep reflexes. Examinations of cranial nerves.
One practical class has been planned per week.

Tutorials (SGD):
Important topics of modules taught in lectures & practicals are discussed again for more elaboration in Tutorial Classes. One tutorial class per week is proposed throughout the academic session. The class is divided into 04 batches. Topics for the tutorial will be notified at least one week before the class.

Two instructors, one senior and one junior, will be deputed for every batch on rotation basis. During this interactive session the students must clear their concepts regarding the topic by actively engaging with their respective teachers.

Class Presentations:
Class presentations are conducted in the Tutorials to allow the students to demonstrate the knowledge about an important topic in Physiology and improve their communication skills.

Class Assignments:
Some of the important topics which are core curriculum of the subject are given to the students to prepare their assignments. Grading of these assignments give good feedback to the teachers and prepare the students for university exams.

TRAINING PROGRAM FOR LECTURES
DEPARTMENT OF PHYSIOLOGY
2ND YEAR MBBS CLASS

Human Physiology is the scientific study of different functions of Human body. Human body is incredible in the sense that it is made up of multiple cells that come together to form tissues, organs and various systems. Physiology includes two approaches to explain any event that is normally occurring within the human body; one emphasizes upon the purpose and the other the underlying mechanism. All of the human body systems serve a useful purpose and Physiology helps in determining what mechanistic process will work and be useful under a particular circumstance. So, Physiology explains how the Human body works with all systems working in harmony to maintain a balanced environment in the body during different circumstances.

1. Central Nervous System (CNS):

(i) Sensory System:

S.No.	Title of Lectures	Name of Instructor
1	Functional organization of the Central Nervous system	Prof. Sana Qanber
2	Major levels of Central Nervous System Functions	Prof. Sana Qanber
3	Synapses	Prof. Sana Qanber
4	Sensory Receptors	Prof. Sana Qanber
5	Neuronal Pools	Prof. Sana Qanber
6	Somatic Senses	Prof. Sana Qanber
7	Sensory Cortex & Sensory Tracts/Pathways	Prof. Sana Qanber
8	Pain Sensation	Prof. Sana Qanber
9	Analgesia System in Brain & Spinal cord	Prof. Sana Qanber
10	Pain and Associated Clinical Abnormalities	Prof. Sana Qanber
11	Thermal Sensation	Prof. Sana Qanber

ii). Motor System:

S.No.	Title of Lectures	Name of Instructor
1	Muscle Sensory Receptors	Prof. Ghazal Mansoor
2	Spinal Cord reflexes	Prof. Ghazal Mansoor
3	Cerebral Cortex & Voluntary Motor Function	Prof. Ghazal Mansoor
4	Motor Tracts/Pathways	Prof. Ghazal Mansoor

5	Brain Stem and Control of Motor Function	Prof. Ghazal Mansoor
6	Cerebellum & Motor Control	Prof. Ghazal Mansoor
7	Basal Ganglia & Motor Control	Prof. Ghazal Mansoor
8	Role of Cerebral Cortex in Learning	Prof. Ghazal Mansoor
9	Speech & Communication	Prof. Ghazal Mansoor
10	Memory	Prof. Ghazal Mansoor
11	Behavioral & Motivational Mechanisms of Brain	Prof. Ghazal Mansoor
12	Limbic System and Hypothalamus	Prof. Ghazal Mansoor
13	Sleep	Prof. Ghazal Mansoor
14	Epilepsy	Prof. Ghazal Mansoor
15	Psychoses & Dementia	Prof. Ghazal Mansoor
16	Cerebrospinal Fluid (CSF)	Prof. Ghazal Mansoor
17	Brain Metabolism	Prof. Ghazal Mansoor

(iii): Autonomics Nervous System:

S.No.	Title of Lectures	Name of Instructor
1	General Organization of ANS	Dr. Sana Javaid
2	Cholinergic and Adrenergic Fibers of ANS	Dr. Sana Javaid
3	Cholinergic and Adrenergic Receptors in Effectors Organs	Dr. Sana Javaid
4	Excitatory and inhibitory actions of sympathetic and parasympathetic stimulation	Dr. Sana Javaid
5	Autonomic Tone and Autonomic Reflexes	Dr. Sana Javaid
6	Responses by ANS stimulation	Dr. Sana Javaid
7	Drugs acting on ANS	Dr. Sana Javaid

2. Special Senses:

S.No.	Title of Lectures	Name of Instructor
1	Chemical senses (olfaction)	Dr. Qurat-ul-Ain
2	Chemical senses (gustatory)	Dr. Qurat-ul-Ain
3	Hearing physiology External ear	Dr. Qurat-ul-Ain

4	Middle Ear	Dr. Qurat-ul-Ain
5	Inner Ear	Dr. Qurat-ul-Ain
6	Vestibular Sensation and Equilibrium Control	Dr. Qurat-ul-Ain
7	Eye (Optics of vision)	Dr. Qurat-ul-Ain
8	Eye (Retina)	Dr. Qurat-ul-Ain
9	Color vision	Dr. Qurat-ul-Ain
10	Phototransduction	Dr. Qurat-ul-Ain
11	Visual pathway	Dr. Qurat-ul-Ain

3. Endocrinology:

S.No.	Title of Lectures	Name of Instructor
1	Introduction to endocrinology	Dr. Sana Javaid
2	Mechanism of action of hormones	Dr. Sana Javaid
3	Hypothalamus and Pituitary gland physiological anatomy and its control	Dr. Sana Javaid
4	Growth hormone	Dr. Sana Javaid
5	Thyroid gland	Dr. Sana Javaid
6	Adrenal gland	Dr. Sana Javaid
7	Adrenal medullary hormones	Dr. Sana Javaid
8	Abnormalities of adrenal gland	Dr. Sana Javaid
9	Calcium regulating hormones	Dr. Sana Javaid
10	Insulin, Glucagon, and Diabetes Mellitus	Dr. Sana Javaid

4. Reproduction System:

S.No.	Title of Lectures	Name of Instructor
1	Male Reproductive System	Dr. Qurat-ul-Ain
2	Female reproductive system	Dr. Qurat-ul-Ain
3	Menstrual cycle	Dr. Qurat-ul-Ain
4	Pregnancy	Dr. Qurat-ul-Ain
5	Placenta	Dr. Qurat-ul-Ain
6	Parturition	Dr. Qurat-ul-Ain

5. Gastrointestinal Tract (GIT):

S.No.	Title of Lectures	Name of Instructor
1	GIT Physiology	Dr. Nazish Jamil
2	Chewing/Swallowing reflex	Dr. Nazish Jamil
3	Functions of Stomach and gastric emptying	Dr. Nazish Jamil
4	Functions of small intestine	Dr. Nazish Jamil
5	Functions of Large intestine	Dr. Nazish Jamil
6	Defecation reflex	Dr. Nazish Jamil
7	Vomiting reflex	Dr. Nazish Jamil
8	Hormones of GIT	Dr. Nazish Jamil
9	Functions of liver	Dr. Nazish Jamil
10	GIT Disorders	Dr. Nazish Jamil

6. Body Fluids & Kidney:

(i) Body Fluids:

S.No.	Title of Lectures	Name of Instructor
1	The Body Fluid Compartments & their Abnormalities	Prof. Ghazal Mansoor
2	Water Balance	Prof. Sana Qanber
3	Edema	Prof. Ghazal Mansoor

(ii) Renal Physiology:

S.No.	Title of Lectures	Name of Instructor
1	Introduction to renal physiology	Prof. Ghazal Mansoor
2	GFR and its regulation	Prof. Sana Qanber
3	Processing of glomerular filtrate; tubular reabsorption and secretion	Prof. Ghazal Mansoor
4	Plasma clearance	Prof. Sana Qanber
5	Regulation of Potassium Calcium, Phosphate and Magnesium	Prof. Ghazal Mansoor
6	Regulation of B.P.	Prof. Sana Qanber
7	Renal regulation of osmolarity	Prof. Ghazal Mansoor
8	Formation of dilute concentrated urine	Prof. Sana Qanber

9	Acid Base balance	Prof. Ghazal Mansoor
10	Acid base disorders	Prof. Sana Qanber
11	Diuretics	Prof. Ghazal Mansoor
12	Micturition	Prof. Sana Qanber
13	Kidney Diseases	Prof. Ghazal Mansoor

LIST OF LECTURES IN THE SUBJECT OF PHYSIOLOGY AND THEIR LEARNING OBJECTIVES

DEPARTMENT OF PHYSIOLOGY

2ND YEAR MBBS CLASS

1. Central Nervous System (CNS):

The nervous system is a highly complex system of the Human body that helps all parts of the body to communicate with each other. The nervous system has three broad functions: Sensory input, information processing, and motor output. It has two major divisions; Central Nervous System (CNS) and Peripheral Nervous system (PNS). Central nervous system (CNS) consists of the brain and spinal cord, and the peripheral nervous system (PNS) consists of nerve fibers that carry information between the CNS and other parts of the body (the periphery).

S.NO	TITLE OF LECTURES WITH LEARNING OBJECTIVES
1.	**Sensory System:** Functional organization of the Central Nervous system: By the end of the topic students will be able to: 1. Describe Basic Organization of the Central Nervous system. 2. Define a Neuron. 3. Explain types of Neurons. 4. Describe the structure and functions of Neurons. 5. Differentiate between the Sensory, integrative/processing, and motor parts of the nervous system.
2.	Major levels of Central Nervous System Functions: By the end of the topic students will be able to: 1. Understand three major levels of Central Nervous System. 2. Describe Spinal Cord level and its specific functional characteristics. 3. Explain the lower brain or subcortical level and associated with the subconscious control. 4. Describe the functions of Higher Brain or Cortical Level.
3.	Synapses: By the end of the topic students will be able to: 1. Understand the synaptic functions of neurons. 2. Differentiate between types of synapses. 3. Explain transmission along a Chemical synapse. 4. Describe the role of excitatory and inhibitory receptors and second messenger system in the postsynaptic neuronal membrane. 5. Define Neurotransmitters. 6. Explain the criteria for labeling a substance as neurotransmitter. 7. Know the different classes of neurotransmitters. 8. Describe Excitatory and Inhibitory post synaptic potentials.

	9. Illustrate the phenomenon of Summation in synapses. 10. Describe the special characteristics of synaptic transmission.
4.	Sensory Receptors: By the end of the topic students will be able to: 1. Describe the type of sensory receptors and the stimuli detected by the sensory receptors. 2. Understand the concept of Differential Sensitivity. 3. Explain The Labeled Line Principle and its significance. 4. Define Receptor Potentials and explain their mechanism. 5. Illustrate Receptor Potential of Pacinian corpuscle. 6. Describe the mechanism of Adaptation of Receptors.
5.	Neuronal Pools: By the end of the topic students will be able to: 1. Define Neuronal Pools. 2. Describe transmission and processing of signals in neuronal pools. 3. Understand the concepts of divergence and convergence of signals in neuronal pools. 4. Explain prolongation of signals by neuronal pools by after discharge.
6	Somatic Senses: By the end of the topic students will be able to: 1. Define and classify Somatic senses. 2. Differentiate three physiological types of somatic senses, mechanoreceptive somatic senses, thermoreceptive, and pain somatic senses. 3. Describe detection and transmission of Tactile Sensations. 4. Explain the structure and function of Tactile receptors. 5. Describe the structure and function of mechanoreceptors and free nerve endings.
7	Sensory Cortex & Sensory Tracts/Pathways: By the end of the topic students will be able to: 1. Describe the sensory part of cerebral cortex, the Somatosensory Cortex. 2. Differentiate between Somatosensory areas I & II. 3. Describe the location and functions of somatosensory areas I & II. 4. Understand the functions of Somatosensory Association Areas. 5. Know the major sensory pathways for transmitting somatic signals into the Central nervous system. 6. Describe Dorsal medial Leminiscal tract (DCMLS), trace its pathway, and explain its functions. 7. Describe Anterolateral tract, trace its pathway, and explain its functions.
8	Pain Sensation: By the end of the topic students will be able to: 1. Define Pain Sensation

	2. Classify types of Pain. 3. Understand different pain stimuli. 4. Describe the pain receptors and their characteristics. 5. Explain fast and slow pain fibers. 6. Describe dual pathways, Neospinothalamic and Paleospinothalamic pathways for pain transmission. 7. Compare & contrast Neospinothalamic and Paleospinothalamic pathways for pain transmission. 8. Describe various theories of pain.
9	Analgesia System in Brain & Spinal cord: By the end of the topic students will be able to: 1. Understand the components of Analgesia system. 2. Explain the function of Analgesia system. 3. Describe the transmitter substances of Analgesia system. 4. Know the role of morphine opiate, endorphins, and enkephalins in producing analgesia.
10	Pain and Associated Clinical Abnormalities: By the end of the topic students will be able to: 1. Describe Referred pain with examples. 2. Explain the concept of visceral pain & illustrate its mechanism with examples. 3. Understand the concept of parietal pain caused by diseases of viscera & role of different pathways. 4. Know about common clinical abnormalities associated with pain e.g., Hyperalgesia, Herpes Zoster (Shingles), Tic Douloureux. 5. Explain the effects of Brown Sequard Syndrome upon one sided spinal cord transaction and its association with loss of pain and thermal sensations. 6. Describe Headache as a type of referred pain. 7. Explain intracranial and extracranial types of headache.
11	Thermal Sensation: By the end of the topic students will be able to: 1. Explain the grades of thermal sensations. 2. Describe different thermal sensory receptors. 3. Explain the mechanism of stimulation of thermal receptors. 4. Understand the transmission of thermal signals in the nervous system.
12	Motor System: Motor Neurons & Motor functions of Spinal Cord: By the end of the topic students will be able to: 1. Explain Spinal cord organization for motor functions. 2. Describe two major types of motor neurons in the spinal cord; Anterior Motor Neurons and Alpha Motor Neurons. 3. Understand the functions of interneurons and gamma motor neurons.

13	Muscle Sensory Receptors: By the end of the topic students will be able to: 1. Know the two sensory receptors in muscles; Muscle spindle and Golgi tendon organ. 2. Describe the structure of muscle spindle and Golgi tendon organ. 3. Explain the receptor function of muscle spindle and Golgi tendon organ. 4. Describe Muscle Stretch reflex and illustrate the role of muscle spindle in Muscle stretch reflex. 5. Understand the types of Muscle stretch reflex. 6. Explain the clinical applications of Muscle stretch reflex. 7. Describe Golgi Tendon Reflex & its significance.
14	Spinal Cord reflexes: By the end of the topic students will be able to: 1. Explain Flexor and Withdrawal reflexes and their neuronal mechanism. 2. Understand Crossed Extensor reflex and its significance. 3. Describe the phenomena of Reciprocal Inhibition and Reciprocal Innervations 4. Explain different reflexes of posture and locomotion. 5. Describe the Autonomic Reflexes in the spinal cord. 6. Understand the concept of Spinal Cord Transection and Spinal shock.
15	Cerebral Cortex & Voluntary Motor Function: By the end of the topic students will be able to: 1. Describe the Motor Cortex and its three subareas. 2. Explain the location and functions of Primary motor cortex, Premotor area, and Supplementary motor area. 3. Define and locate specialized motor areas in human cortex.
16	Motor Tracts/Pathways: By the end of the topic students will be able to: 1. Understand how signals are transmitted from Motor cortex to the Muscles. 2. Describe Corticospinal (Pyramidal) tract, trace its pathway, and explain its functions. 3. Explain Extrapyramidal Tracts for motor signal transmission. 4. Compare & contrast Pyramidal and Extrapyramidal tracts for motor control. 5. Explain minor motor pathways.
17	Brain Stem and Control of Motor Function: By the end of the topic students will be able to: 1. Identify different parts of Brain stem. 2. Understand the special control functions and command signals of the brain stem. 3. Describe the role of Reticular and Vestibular Nuclei in support of the

	body against gravity. 4. Explain the role of pontine and medullary reticular systems in motor control. 5. Understand the control of antigravity muscles by vestibular nuclei. 6. Define and explain the concept of Decerebrate Spastic Rigidity.
18	Cerebellum & Motor Control: By the end of the topic students will be able to: 1. Define & locate Cerebellum. 2. Describe the anatomical & functional areas of Cerebellum. 3. Explain the neuronal circuitry of Cerebellum (Afferent and Efferent Cerebellar pathways). 4. Describe the functional organization of Cerebellar cortex. 5. Enumerate Deep Cerebellar nuclei and enlist their functions. 6. Understand the differences in the role of Cerebellar Mossy and Climbing fibers in controlling motor functions. 7. Explain the coordination of motor control at three levels of Cerebellum; Vestibulocerebellum, Spinocerebellum, and Cerebrocerebellum. 8. Describe the clinical signs and functions of cerebellum in detail. 9. Explain the clinical abnormalities of Cerebellum.
19	Basal Ganglia & Motor Control: By the end of the topic students will be able to: 1. Understand how Basal ganglia function as an accessory motor system in conjunction with other motor systems. 2. Enumerate Basal ganglia. 3. Describe the anatomical relations of Basal ganglia with other structures of the brain. 4. Explain the neuronal circuitry of Basal ganglia. 5. Describe the Putamen circuit, its significance and associated abnormalities. 6. Understand the role of Caudate circuit of Basal ganglia in cognitive control. 7. Describe the functions of Basal ganglia in reference to primitive motor cortex. 8. Explain different neurotransmitters in Basal ganglia. 9. Describe the role of Dopamine and GABA in controlling motor functions through Basal ganglia. 10. Explain Parkinson's Syndrome, its clinical manifestations, and treatment options.
20	Role of Cerebral Cortex in Learning: By the end of the topic students will be able to: 1. Understand the Physiological anatomy of Cerebral cortex. 2. Describe the Thalamocortical System and its significance. 3. Explain the functions of specific cortical areas and cortical association areas. 4. Define and locate the general interpretative area, Wernicke's area and describe its functions.

	5. Understand the concept of Dominant Hemisphere. 6. Explain Prefrontal Association areas and their significance in human intellect.
21	Speech & Communication: By the end of the topic students will be able to: 1. Understand the function of Brain in Speech & Communication. 2. Explain the Sensory & Motor aspects of speech. 3. Describe Wernicke's Aphasia & Global Aphasia. 4. Explain Motor aphasia and its association with the Broca's motor speech area. 5. Illustrate the phenomenon of Articulation and explain the structures responsible for Articulation.
22	Memory: By the end of the topic students will be able to: 1. Understand the role of Corpus Callosum in transferring thoughts, memories and information between the two cerebral hemispheres. 2. Explain the Physiological basis of Memory and role of synaptic facilitation and synaptic inhibition in memory. 3. Classify and describe the mechanism of three principal types of Memories. 4. Explain the term Consolidation of Memory. 5. Define the role of Hippocampus in Memory. 6. Describe Amnesia and its types.
23	Behavioral & Motivational Mechanisms of Brain: By the end of the topic students will be able to: 1. Explain the Activating systems of the Brain. 2. Describe the role of Brain stem excitatory and inhibitory signals to control behavior and motivation. 3. Understand the role of excitatory and inhibitory neurohormones, norepinephrine, dopamine, and serotonin in providing long periods of control.
24	Limbic System and Hypothalamus: By the end of the topic students will be able to: 1. Understand the role of Limbic system in controlling Behavior. 2. Describe the functional anatomy of limbic system. 3. Enlist parts of limbic system. 4. Explain how Hypothalamus is the physiological centre of the limbic system. 5. Trace the limbic system. 6. Describe various functions of Hypothalamus in relation to its nuclei. 7. Explain Reward and Punishment centers and their significance in controlling behavior. 8. Define the role and functions of other parts of limbic system in behavior such as Hippocampus & Amygdala. 9. Explain Kluver-Bucy syndrome

25	Sleep: By the end of the topic students will be able to: 1. Define Sleep & differentiate between sleep and coma. 2. Describe the two types of sleep, REM and NREM sleep. 3. Explain the basic theories of sleep. 4. Define the role of neuronal centers and neurohumoral substances in causing sleep. 5. Describe the physiological functions of Sleep. 6. Explain different types of Brain Waves, their origin, interpretation, and role of EEG. 7. Describe the changes in EEG during sleep and wakefulness.
26	Epilepsy: By the end of the topic students will be able to: 1. Understand the concept of symptomatic seizures and Epilepsy. 2. Describe different types of Epilepsy. 3. Explain the treatment of Epilepsy.
27	Psychoses & Dementia: By the end of the topic students will be able to: 1. Understand the role of different specific neurotransmitters in Psychoses. 2. Explain Depressive & Maniac-Depressive Psychoses. 3. Define Schizophrenia explain its pathophysiology. 4. Describe Alzheimer's disease and one of leading causes of dementia.
28	Cerebrospinal Fluid (CSF): By the end of the topic students will be able to: 1. Understand the mechanism of cerebral blood flow and its regulation. 2. Describe cerebral microcirculation. 3. Explain Cerebral Stroke. 4. Define Cerebrospinal Fluid system. 5. Describe the general characteristics and composition of CSF. 6. Explain the site of synthesis of CSF. 7. Trace the pathway of flow of CSF in brain ventricles. 8. Describe the role of Arachnoidal villi in absorption of CSF. 9. Explain the functions of CSF. 10. Describe the Cushioning Effect. 11. Explain Coup and Counter coup brain injuries. 12. Describe the significance of measurement of CSF pressure and role of Lumbar Puncture. 13. Explain Hydrocephalus and its types. 14. Differentiate between Blood brain Barrier and Blood CSF barrier. 15. Compare and Contrast Hydrocephalus and Brain edema.

29	Brain Metabolism: By the end of the topic students will be able to: 1. Explain the total brain metabolic rate and metabolic rate of neurons. 2. Describe the importance of continuous oxygen supply to brain. 3. Understand the role of glucose in maintaining brain energy under normal conditions.
30	**<u>Autonomic Nervous System (ANS):</u>** General Organization of ANS: By the end of the topic students will be able to: 1. Understand that ANS operates through centers located in spinal cord, brain stem, hypothalamus, and also through visceral reflexes. 2. Describe two major divisions of ANS; Sympathetic and Parasympathetic Nervous systems. 3. Explain the Physiological Anatomy of Sympathetic and Parasympathetic Nervous systems.
31	Cholinergic and Adrenergic Fibers of ANS: By the end of the topic students will be able to: 1. Explain Cholinergic and Adrenergic Fibers of ANS in terms of neurotransmitters secreted by these fibers. 2. Explain neurotransmitters secreted by preganglionic and postganglionic Sympathetic and Parasympathetic fibers. 3. Describe acetylcholine and norepinephrine as major neurotransmitters of ANS. 4. Explain mechanisms of Transmitter secretion and removal at postganglionic endings. 5. Describe synthesis, secretion, destruction, and duration of action of Acetylcholine. 6. Describe synthesis, secretion, destruction, and duration of action of norepinephrine.
32	Cholinergic and Adrenergic Receptors in Effector Organs: By the end of the topic students will be able to: 1. Understand that acetylcholine and norepinephrine bind to specific receptors on the effectors to produce action. 2. Describe the two principal types of acetylcholine receptors; Muscarinic & Nicotinic Receptors. 3. Explain the two principal types of adrenergic receptors; alpha and beta receptors.

33	Excitatory and inhibitory actions of sympathetic and parasympathetic stimulation: By the end of the topic students will be able to: 1. List the effects on different visceral functions of the body caused by stimulating either the parasympathetic nerves or the sympathetic nerves. 2. Understand that sympathetic and parasympathetic stimulation causes excitatory effects in some organs but inhibitory effects in others. 3. Demonstrate that the two systems occasionally act reciprocally to each other. 4. Explain the effects of sympathetic stimulation on functions of Adrenal medulla.
34	Autonomic Tone and Autonomic Reflexes: By the end of the topic students will be able to: 1. Define sympathetic and parasympathetic tone. 2. Explain the examples and significance of Autonomic tone. 3. Describe the effects of loss of sympathetic and parasympathetic tone after denervation. 4. Enlist different autonomic reflexes and illustrate their significance in regulating visceral functions.
35	Responses by ANS stimulation: By the end of the topic students will be able to: 1. Explain Mass Discharge by Sympathetic System. 2. Describe specific localized responses by Parasympathetic system. 3. Define and explain Alarm or Stress Response.
36	Drugs acting on ANS: By the end of the topic students will be able to: 1. Understand sympthomimetic drugs, their names and actions. 2. Explain sympatholytic drugs with examples. 3. Describe parasympathomimetic and parasympatholytic drugs with examples.

2. Special Senses:

In this unit the students will study the Physiological aspects of special senses and their clinical correlation. The Special Senses that have specialized organs vision (the eye), hearing and balance (the ear, which includes the auditory system and vestibular system), smell (the nose), taste (the tongue).

S.NO	TITLE OF LECTURES WITH LEARNING OBJECTIVES
1	Chemical senses (olfaction): By the end of the topic students will be able to: 1. Describe the physiology of olfaction its pathway and abnormalities. 2. Understand the olfactory transduction. 3. Discuss abnormalities related to olfactory mechanism

2	Chemical senses (gustatory): By the end of the topic students will be able to: 1. Explain the physiology of taste, its pathway and abnormalities. 2. Describe different taste transduction
3	Hearing physiology External ear: By the end of the topic students will be able to: 1. Explain physiological anatomy of external ear. 2. Enlist functions of external ear
4	Middle Ear: By the end of the topic students will be able to: 1. Explain physiological anatomy of middle ear. 2. Understand impedance matching 3. Explain attenuation reflex along physiological importance
5	Inner Ear: By the end of the topic students will be able to: 1. Explain physiological anatomy of the inner ear. 2. Discuss mechanism of hearing. 3. Describe the signal transduction for hearing and auditory pathway. 4. Explain the Phenomena of determination of the sound frequency, loudness and direction of sound. 5. Discuss deafness.
6	Vestibular Sensation and Equilibrium Control: By the end of the topic students will be able to: 1. Define and locate Vestibular Apparatus. 2. Understand the Functional anatomy of Vestibular Apparatus. 3. Explain the role of Sensory Organs Utricle & Saccule in controlling orientation of head with respect to gravity. 4. Describe the sensitivity of stereocilia and kinocillium in detecting head direction. 5. Explain semicircular ducts and their role in detecting head rotation and direction. 6. Illustrate Static equilibrium and its control by Utricle and Saccule. 7. Explain the role of Neck propioceptors and other factors in controlling equilibrium.
7	Eye (Optics of vision): By the end of the topic students will be able to: 1. Understand structure of human eye. 2. Discuss the errors of refraction. 3. Understand fluid system of the eye
8	Eye (Retina): By the end of the topic students will be able to:

	1. Explain physiological anatomy of retina. 2. Explain photochemistry of vision. 3. Understand Wald visual cycle and night blindness. 4. Describe neural functions of the retina.
9	Color vision: By the end of the topic students will be able to: 1. Describe theories of color vision, primary colors. 2. Explain color blindness.
10	Phototransduction: By the end of the topic students will be able to: 1. Describe phototransduction cascade of receptor potential. 2. Understand mechanism of dark and light adaptation.
11	Visual pathway: By the end of the topic students will be able to: 1. Discuss the lesions of the visual pathway. 2. Discuss Argyll Robertson pupil and Horner's syndrome. 3. Define visual field, blind spot and abnormalities of visual field.

3. Endocrinology:

Endocrine system coordinates and integrates the cellular activities in the human body. The objective of this unit is to know the basic concept of molecular endocrinology, knowledge of endocrine glands and their relation with hypothalamus of action, Physiological functions and the related disorders with the completion of this unit student must be able to identify the common endocrinological disorder.

S.NO	TITLE OF LECTURES WITH LEARNING OBJECTIVES
1	Introduction to endocrinology: By the end of the topic students will be able to: 1. Describe the general principle of endocrinology (classification, mechanism of action and feedback control). 2. Understand the hormone secretion, transport, and clearance from the blood
2	Mechanism of action of hormones: By the end of the topic students will be able to: 1. Discuss the intracellular signaling after hormone receptor activation. 2. Explain the second messenger mechanisms for mediating intracellular hormonal functions 3. Discuss the mechanism of action of hormones that act mainly on the genetic machinery of the cell 4. Describe measurement of Hormone Concentrations in the Blood 5. Understand the technique of ELISA
3	Hypothalamus and Pituitary gland physiological anatomy and its control: By the end of the topic students will be able to:

	1. Discuss the neuroendocrine functions of the hypothalamus 2. Discuss the hypothalamic-hypophysial portal blood vessels of the anterior pituitary gland 3. Enumerate the hormones of anterior and posterior pituitary. 4. Explain the relation of posterior pituitary gland and hypothalamus 5. Describe formation, release and physiological functions of Oxytocin 6. Describe formation, release and physiological functions of ADH. 7. Discuss the etiology, clinical features, investigations and treatment of a patient with diabetes Insipidus and SIADH.
4	Growth hormone: By the end of the topic students will be able to: 1. Identify the factors and hormones that affect growth beside the growth hormone. 2. Know the physiological functions of growth hormone and metabolic effect of growth hormone. 3. Identify the relationship between growth hormone and insulin-like growth factors 4. Discuss the regulation of growth hormone secretion 5. Describe the hypopituitarism and hyperpituitarism 6. Describe the etiology, clinical features , pathophysiology, investigations and treatment of Dwarfism, Sheehan's syndrome, Gigantism and Acromegaly 7. Describe the endocrine function of pineal gland and biological effect of melatonin hormone.
5	Thyroid gland: By the end of the topic students will be able to: 1. Enumerate the hormones secreted from thyroid gland 2. Describe synthesis, Secretion, transport , mechanism of action and regulation of thyroid hormones 3. Describe the physiologic function and effects of Thyroid Hormone on Growth, metabolism and body systems 4. Explain the etiology, clinical features , pathophysiology, investigations and treatment of hyperthyroidism 5. Explain the etiology, clinical features , pathophysiology, investigations and treatment of hypothyroidism 6. Know the types and mechanism of action of Antithyroid drugs
6	Adrenal gland: 1. By the end of the topic students will be able to: 2. Hormones of adrenal cortex 3. Know the physiological anatomy and histology of adrenal gland 4. Enumerate the hormones secreted from adrenal cortex 5. Discuss the synthesis, transport, fate and secretion of adrenocortical hormones 6. Describe the functions and regulation of the mineral corticoids/aldosterone 7. Describe the functions and regulation of the glucocorticoids 8. Discuss the abnormalities of adrenocortical secretion
7	Adrenal medullary hormones:

	By the end of the topic students will be able to: 1. Enumerate the hormones secreted from adrenal medulla 2. Discuss the secretion, mechanism of action, regulation and metabolic effects of Adrenal medullary hormones
8	Abnormalities of adrenal gland: By the end of the topic students will be able to: 1. Discuss the abnormalities of adrenal gland, CAH (Congenital Adrenal Hyperplasia), Cushing disease/ syndrome, Addison disease, Pheochromocytoma, Conn's syndrome and Adrenogential system.
9	Calcium regulating hormones: By the end of the topic students will be able to: 1. Know the regulation of calcium and phosphate in the extracellular fluid and plasma 2. Discuss the hormones that play role in calcium homeostasis 3. Explain the activation and physiological role of vitamin D 4. Discuss the Physiological functions , mechanism of action and Control of the Parathyroid hormone 5. Explain the physiological functions of calcitonin in Calcium metabolism 6. Describe the pathophysiology of parathyroid hormone, vitamin D, and bone disease.
10	Insulin, Glucagon, and Diabetes Mellitus: By the end of the topic students will be able to: 1. Describe the endocrine functions of the pancreas and regulation of blood glucose level. 2. Explain the Mechanism of action of insulin &its regulation 3. Describe the effects of insulin on carbohydrates, proteins and Fats metabolism 4. Explain functions and regulation of glucagon secretion 5. Describe the physiological actions of Somatostatins 6. Discuss the types , causes ,clinical features , pathophysiology, investigations, complications and management of diabetes mellitus 7. Discuss hypoglycaemia.

4. Reproduction System:

The reproductive system or genital system is a set of organs that works together to produce offspring. Female reproductive system is design to produce carry transport fertilize and implant the zygote in the uterine wall. Male reproduction is designed to produce male gametes and secondary sexual characteristics in males.

S.NO	TITLE OF LECTURES WITH LEARNING OBJECTIVES
1	Male Reproductive System: By the end of the topic students will be able to: 1. Understand the physiologic anatomy of male sexual organs

	2. Discuss the process of spermatogenesis 3. Explain the function of the seminal vesicles and prostate gland 4. Comprehend abnormal spermatogenesis and male fertility 5. Understand the testosterone and other male sex hormones to be able to describe the physiological changes during male puberty. 6. Interpret semen analysis.
2	Female reproductive system: By the end of the topic students will be able to: 1. Discuss the physiology of the female reproductive system. 2. Explain the production and function of oestrogen and progesterone. 3. Know the gonadotropic hormones and their effects on ovarian follicle growth- luteal phase of the ovarian cycle corpus luteum 4. Know the ovarian and endometrial cycle. 5. Describe the physiological changes during female puberty and menopause.
3	Menstrual cycle: By the end of the topic students will be able to: 1. Know the regulation of the female monthly cycle 2. Explain pituitary ovarian system 3. Understand interplay between the ovarian and hypothalamic-pituitary hormones and feedback oscillation of the hypothalamic 4. Explain female puberty, menarche and menopause
4	Pregnancy: By the end of the topic students will be able to: 1. Discuss the maturation and fertilization of the ovum , transportation of the fertilized ovum in the fallopian tube (physiology of pregnancy) 2. Understand the implantation of mechanism and nutrition of the embryo
5	Placenta: By the end of the topic students will be able to: 1. Discuss the functions of placenta. 2. Know the placental hormones 3. 3. Understand effects of human chorionic gonadotrpin hormone
6	Parturition: By the end of the topic students will be able to: 1. Discuss the hormones regulating parturition, lactation and development of breast.

6. Gastrointestinal (GIT):

The GIT includes the digestive tract and its accessory organs, which process food into molecules by different enzymatic and hormonal actions. To be absorb by the cell of the body through passes through esophagus, stomach, small & large intestines and base product are eliminated. Digestive process is controlled by both hormones and nerves.

S.NO	TITLE OF LECTURES WITH LEARNING OBJECTIVES
1	Introduction to GIT: By the end of the topic students will be able to: 1. Understand the physiologic Anatomy of gastrointestinal tract. 2. Comprehend the role of intestinal cells of cajal in the electrical activity of GIT smooth muscle 3. Discuss the enteric nervous system and its role in control of GIT function
2	Chewing/Swallowing reflex: By the end of the topic students will be able to: 1. Explain the importance of chewing defines mastication and its mechanism. 2. Describe the process of swallowing. 3. Understand different stages of swallowing reflex. 4. Understand different steps of involuntary phase of swallowing. 5. Know how different types of peristalsis in esophagus are taking place. 6. Discuss the importance of esophageal sphincter.
3	Functions of Stomach and gastric emptying: By the end of the topic students will be able to: 1. Categorize different functions of stomach. 2. Understand the process of stomach emptying. 3. Describe hunger pains and their mechanism. 4. Explain MMC (migrating motor complex). 5. Explain the different factors regulating stomach emptying. 6. Know different hormones taking place in stomach. 7. Comprehend the mechanism of HCl secretion.
4	Functions of small intestine: By the end of the topic students will be able to: 1. Discuss different types of movements taking place in small intestine. 2. Understand role of ileocecal valve. 3. Explain secretory functions of small intestine. 4. Define peristaltic rush.
5	Functions of Large intestine: By the end of the topic students will be able to: 1. Explain different colonic movements. 2. Classify movements of colon. 3. Understand the role of gastrocolic and duodenocolic reflexes in regulation of mass movements. 4. Explain the secretory functions of large intestine & its nervous control
6	Defecation reflex: By the end of the topic students will be able to: 1. Explain the process of defecation. 2. Understand the pathway of defecation reflex.

	3. Know different types of defecation reflex. 4. Know the pathophysiological bases of mega colon.
7	Vomiting reflex: By the end of the topic students will be able to: 1. Understand the factors causing the process of vomiting. 2. Explain location of vomiting center in the brain and vomiting reflex. 3. Explain the role of chemoreceptor trigger zone for initiating vomiting.
8	Hormones of GIT: By the end of the topic students will be able to: 1. Classify different types of G.I.T hormones. 2. Understand the secretion of different hormones and their regulation.
9	Functions of liver: By the end of the topic students will be able to: 3. Discuss the type, cause and clinical features of Jaundice. Enlist and interpret liver function tests. 4. Describe the functions of liver and gall bladder. 5. Enlist and interpret liver function tests. 6. Know the synthetic functions of liver.
10	GIT Disorders: By the end of the topic students will be able to: 1. Discuss the causes and clinical findings of Dysphagia. 2. Describe Achalasia, peptic ulcer and Megacolon. 3. Explain the physiology of Diarrhea and constipation.

7. Body Fluids and Kidney:

In this unit students will study the physiological aspects of Renal System which deals with the excretion of waste products, Regulation of acid base balance, water and electrolytes balance and role of kidney in regulation of blood pressure. Renal diseases are common in community so the basics causes and pathophysiology of common understand Renal System Disorder. So, on the completion of unit student must be able to describe the Physiological Anatomy and functions of Kidney along with the related pathologies:

i. Body Fluids:

S.NO	TITLE OF LECTURES WITH LEARNING OBJECTIVES
1	The Body Fluid Compartments and their Abnormalities: By the end of the topic students will be able to: 1. Explain total body water content and its distribution in different body compartments 2. Describe the components and quantitative measurements of body fluids. 3. Know the ionic composition of ECF and ICF
2	Water Balance: By the end of the topic students will be able to:

	1. Understand the basic principles of osmosis and osmotic pressure 2. Know the mechanism of maintenance of osmotic equilibrium between ICF and ECF 3. Explain the effect on ICF and ECF compartments when isotonic, hypotonic and hypertonic solution is added to ECF with concept of dehydration, rehydration, over hydration and edema.
3	Edema: By the end of the topic students will be able to: 1. Define edema, its types. 2. Describe the causes of intracellular edema and extracellular edema 3. Understand the role of starling forces in the development/ prevention of edema 4. Describe role of lymphatics in prevention of edema 5. Define safety factor and its role in the prevention of edema.

ii. Renal Physiology:

S.NO	TITLE OF LECTURES WITH LEARNING OBJECTIVES
1	Introduction to renal physiology: By the end of the topic students will be able to: 1. State the major endocrine and none endocrine functions of the kidney 2. Know the brief physiological anatomy of kidney. 3. Define the components and types of the nephron and their interrelationships: renal corpuscle, glomerulus, nephron, and collecting-duct system. 4. Describe juxtaglomerular apparatus and its cell types. 5. Explain the processes involved in urine formation resulting from glomerular filtration, tubular reabsorption, and tubular secretion
2	GFR and its regulation: By the end of the topic students will be able to: 1. Know the composition of the glomerular filtrate and glomerular capillary membrane 2. Defines podocytes, foot processes, slit diaphragms ,glomerular mesangial cells and states their functions 3. Define GFR and discuss the determinants GFR. 4. Explain the factors affecting the GFR, role of sympathetic nervous system, hormones and autacoids that influence GFR. 5. Define renal blood flow, renal plasma flow, filtration fraction, their formulas and values. 6. Discuss the physiological control of renal blood flow. 7. Describe the effects of changes in afferent and efferent arteriolar resistances on renal blood flow 8. Define Autoregulation of GFR and renal blood flow. 9. Describe the myogenic tubuloglomerular feedback mechanism of Autoregulation
3	Processing of glomerular filtrate; tubular reabsorption and secretion:

	By the end of the topic students will be able to: 1. Describe the mechanism of reabsorption and secretion by the renal tubules 2. Explain the passive and active mechanisms; the major characteristics of diffusion, facilitated diffusion, primary active transport, secondary active transport and endocytosis involved in tubular reabsorption 3. Explain the concept of transport maximum and gradient-time transport. 4. Draw and interpret the glucose titration curve. 5. Discuss the reabsorption and secretion along different parts of the nephron 6. Discuss the peritubular capillary and renal Interstitial fluid physical force 7. Explain the regulation of tubular reabsorption
4	Plasma clearance: By the end of the topic students will be able to: 1. Know the use and importance of clearance methods to quantify kidney function. 2. Estimation of GFR by inulin clearance, and plasma creatinine clearance 3. Understand PAH clearance for estimation of renal plasma flow 4. Interpret the calculation of filtration fraction, tubular reabsorption and secretion from renal clearance
5	Regulation of Potassium Calcium, Phosphate and Magnesium: By the end of the topic students will be able to: 1. Discuss the internal potassium distribution and factors that can alter potassium distribution between the intracellular and extracellular fluid 2. Understand the potassium secretion by principal cells of late distal and cortical collecting tubules 3. Explain different factors that regulate potassium secretion: plasma potassium concentration, aldosterone, tubular flow rate, and hydrogen ion concentration 4. Discuss the excretion and extracellular concentration of calcium ion , Phosphate and magnesium ion 5. Identify the factors that alter renal calcium and phosphate excretion.
6	Regulation of B.P: By the end of the topic students will be able to: 1. Define the role of kidneys in pressure natriuresis and diuresis 2. Understand the renal regulation of body fluid volumes and arterial pressure 3. Explain role of nervous and hormonal factors in renal-body fluid feedback control
7	Renal regulation of osmolarity: By the end of the topic students will be able to: 1. Discuss the regulation of extracellular fluid osmolarity and sodium concentration by kidneys 2. Describe the osmoreceptor-ADH feedback system

	3. Discuss the physiology and pathophysiology of ADH in the formation dilute and concentrated urine. 4. Understand the role of thirst in controlling extracellular fluid osmolarity and sodium concentration 5. Explain the role of angiotensin II and aldosterone in controlling extracellular fluid osmolarity and sodium concentration 6. Illustrate the concept of "Free Water" and osmolar clearances
8	Formation of dilute concentrated urine: By the end of the topic students will be able to: 1. Understand the concept of obligatory urine volume 2. Explain about the requirements for excreting a concentrated urine—high ADH levels and hyperosmotic renal medulla 3. Describe the countercurrent mechanism producing a hyperosmotic renal medullary interstitium 4. Discuss the role of distal tubule and collecting ducts in excreting a concentrated urine 5. Explain role of urea in hyperosmotic renal medullary interstitium and formation of concentrated urine 6. Describe the role of countercurrent exchange in the vasa recta in preservation of hyperosmolarity of the renal medulla 7. Explain the concentrating mechanism and changes in osmolarity in different segments of the tubule
9	Acid Base balance: By the end of the topic students will be able to: 1. Know the basic concept of acid base, pH and buffers. 2. Explain the defenses against changes in hydrogen ion concentration**:** 3. Name the Buffer Systems operating in the Body 4. Discuss the bicarbonate buffer system, phosphate buffer system, proteins: important intracellular and extracellular buffers 5. Explain the respiratory regulation and renal control of acid-base balance 6. Describe the mechanism of acidification of urine and its importance.
10	Acid base disorders: By the end of the topic students will be able to: 1. Discuss the mechanism and effects of metabolic acidosis and alkalosis on human body and their compensations. 2. Discuss the Renal Correction of acidosis—increased excretion of hydrogen ions and addition of bicarbonate ions to the extracellular fluid 3. Discuss the renal correction of alkalosis—decreased tubular secretion of hydrogen ions and increased excretion of bicarbonate ions 4. Know the use of the acid-base nomogram for diagnosis of acid base disorders. 5. Understand causes of acid base disorders. 6. Explain the concept of anion gap.
11	Diuretics:

	By the end of the topic students will be able to: 4. Classification of diuretics, their mechanisms of action, and tubular sites of action.
12	Micturition: By the end of the topic students will be able to: 1. Explain the physiological anatomy and nerve supply of urinary bladder 2. Understand the mechanism of bladder filling; Cystrometrogram 3. Explain the micturition reflex and facilitation and inhibition of micturition by higher centers 4. Discuss the abnormalities of mituration.
13	Kidney Diseases: By the end of the topic students will be able to: 1. Know the acute renal injury with its categories and their causes. 2. Discuss the physiological effects of acute kidney injury 3. Understand how the vicious cycle of chronic kidney disease lead to end-stage renal disease 4. Know the causes of chronic kidney disease 5. List the renal function test and discuss their clinical significance. 6. Understand the principle of dialysis.

PHYSIOLOGY PRACTICALS:

Nervous System

1. Examination of superficial reflexes.
2. Examination of deep reflexes.
3. Examination of motor system.
4. Perform the cerebellar function tests.
5. Examination of sensory system.
6. Study the triple response of Lewis.
7. Demonstrate the clinical tests for examination of 12 cranial nerves.

Special Senses

1. Plot the peripheral field of vision (Perimetry and confrontational methods).
2. Elicitation of light reflex (direct and consensual) and accommodation reflex.
3. Test the visual acuity for near and distant vision.
4. Examine the fundus of eye (Ophthalmoscopy).
5. Demonstrate the hearing and equilibrium test.
6. Testing the colour vision.
7. Test the senses of taste and smell.

Reproduction

1. Perform and interpret the Pregnancy Test.

Skin and body temperature regulation

1. Record the human body temperature using a clinical thermometer.

Renal Physiology:

1. To determine the specific gravity by Urinometer.

SHARIF MEDICAL & DENTAL COLLEGE

TIME TABLE, 2ndYEAR MBBS (Session 2022 - 2023)

Dated:-25-01-2023 S.M&D.C No/SMDC/Path/3397-23/2023 Dated: 22-01-2023

Day & Time	08:30am - 09:15am	09:15am - 10:00am	10:00am - 11:00am	11:00am - 11:30pm	11:30am - 12:30pm	12:30pm - 02:30pm
Monday	Biochemistry Lecture Lecture Hall 1	Physiology Lecture Lecture Hall 1	Clinical Lecture Medicine Lecture Hall 1	**Break**	Self Direct Learning Dissection Hall	Histology Practical Physiology Practical B Biochemistry Practical C Tutorial Physiology / Biochemistry (SGD) D (alternate weeks) Demonstration Room No. 1 - 1
Tuesday	Physiology Lecture Lecture Hall 1	Self Direct Learning Anatomy Lecture Hall 1	Patient Safety Lecture (31st Jan & 7th Feb) Clinical Lecture Surgery (14th Feb - End of Session) Lecture Hall 1	**Break**	Anatomy Dissection / Demonstration (SGD)	Histology Practical D Physiology Practical C Biochemistry Practical B Tutorial Physiology / Biochemistry (SGD) A (alternate weeks) Demonstration Room No. 1 - 1

Day & Time	10:00am - 10:30am	10:30am - 12:30pm	12:30pm - 01:30pm	01:30pm - 02:30pm
Wednesday	**Break**	Histology Practical C Physiology Practical D Biochemistry Practical A Tutorial Physiology / Biochemistry (SGD) B (alternate weeks) Demonstration Room No. 1 - 1	Behavioral Sciences Lecture Lecture Hall 1	Physiology Lecture Lecture Hall 1

Day & Time	08:30am - 09:30am	09:30am - 10:15am	10:15am - 10:45am	10:45am - 11:45am	11:45am - 12:30pm	12:30pm - 02:30pm
Thusrday	Anatomy Lecture Lecture Hall 1	Clinical Lecture Research Methodology (2nd February - 20th April) Nephrology (27th April - 10th August) Gynae & Obs. (17th August - 21st September) Neurosurgery (28th September - End of Session) Lecture Hall 1	**Break**	Self Direct Learning Physiology Lecture Hall 1	Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Library) Roll No. 51 - 100 (Demo Room 0 - 2)	Histology Practical B Physiology Practical A Biochemistry Practical D Tutorial Physiology / Biochemistry (SGD) C (alternate weeks) Demonstration Room No. 1-1

Day & Time	08:30am - 09:30am	09:30am - 10:30am	10:30am - 11:45am	11:45am - 12:30pm
Friday	Biochemistry Lecture Lecture Hall 1	Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Demonstration Room 1 - 5) Roll No. 51 - 100 (Library)	Anatomy Dissection / Demonstration (SGD)	Physiology Lecture Lecture Hall 2

Day & Time	08:30am - 09:15am	09:15am - 10:00am	10:00am - 10:30am	10:30am - 11:45am	11:45am - 12:30pm	12:30pm-01:30pm	01:30pm - 02:30pm
Saturday	Islamiyat / Pak. Studies Lecture Hall 1	Biochemistry Lecture Lecture Hall 1	**Break***	Behavioral Sciences Lecture* Lecture Hall 3	Self Direct Learning Physiology Lecture Hall 3	Self Direct Learning Dissection Hall	Anatomy Dissection / Demonstration (SGD)

Copy Forwarded To:

1: Dr. Muhammad Adnan Khan Chief Executive SMC
2:Principal SMDC
3:Principal, College of Dentistry
4:Heads of all concerned Departments
5:Director Administration
6: Notice Boards

*** Amendments in Time Table ONLY for 2nd Saturday of every month.**

1. Break 10:00am - 10:15am
2. Mentorship Session 10:15am - 11:00am
3. Behavioral Sciences Lecture 11:00am - 11:45am

Prof. Maria Aslam
Head Deptt. of Pathology
Chairperson Time Table Committee

ASSESSMENT PLAN

DEPARTMENT OF PHYSIOLOGY

SHARIF MEDICAL & DENTAL COLLEGE LAHORE

Following modes of assessment are planned for 2nd Year MBBS class in the subject of Physiology. This plan has been designed keeping in view the university curriculum and hopefully will facilitate the students in preparing for 2nd Professional Examinations in the subject.

UNITS Tests:
Two tests will be conducted from each unit. The test will comprise of MCQs and SEQs on the pattern of university examinations. A preparatory time of at least one week shall be given prior to these tests.

VIVA VOCE:
Viva for every unit will be conducted after the completion of each topic.

OSPE Tests:
In order to prepare the students for practical examinations at least two OSPE tests will be conducted on the pattern of university examinations.

SEND-UPS:
This will be conducted at the completion of course exactly following the format of UHS Professional Exams. This will comprise of MCQ's, SEQ's and viva segments and a sizeable portion of the total course will be included in each of them.

Internal Assessment:
Internal assessment will be calculated out of 20 on the basis of all these tests that will be conducted throughout the year.

Formative Assessment

(At the end of each topic taught)

Topic	No. of test	Marks	Evaluation
Body Fluids & Kidney	01	100 marks each	Written (SEQ's + MCQ's + VIVA)
Renal Physiology	02	100 marks each	Written (SEQ's + MCQ's + VIVA)
Endocrinology	02	100 marks each	Written (SEQ's + MCQ's + VIVA)
GIT	02	100 marks each	Written (SEQ's + MCQ's + VIVA)
Special Senses	02	100 marks each	Written (SEQ's + MCQ's + VIVA)
CNS	03	100 marks each	Written (SEQ's + MCQ's + VIVA)
OSPE	01	100 marks each	Written + Viva + OSPE

Summative Assessment for SENDUP Examination

Assessment	Tools	Marks Distribution	Tool	Marks Distribution	Internal Assessment	Weightage
SENDUP	Theory 09 SEQs	45 5 marks each	MCQs 1 best type 45 MCQs	45 marks 1 mark each	10 marks	10%

Table of Specifications (TOS)

SENDUP EXAMS

Theory (Total Marks: 90)

Topics/ Chapter	**No. of MCQ's**	**No. of SEQ's**
Renal and body fluids	10	02
Central nervous system	16	02
Special senses	04	01
Endocrinology	06	02
Reproduction	04	01
GIT	05	01
Total	45	09
Total Marks	**45 Marks**	**45 Marks**

- 25% MCQ's and SEQ's should be clinically oriented or problem based
- 01 Mark for each MCQ's and 05 Marks for each SEQ's.
- 10 Marks are allocated for Internal Assessment.
- Total Marks for Theory Paper : SEQ's + MCQ's + Internal Assessment = **100 Marks (45+45+10=100)**

Marks Distribution for UHS SECOND Professional

Theory		OSPE/ Practical & VIVA VOCE							Internal Assessment	Grand Total
MCQ's	SEQ's	OSPE		Practical Performance			VIVA VOCE			
45 01 Marks Each	09 05 Marks Each	03 Observed Stations 05 Marks Each	10 Unobserved Stations 01 Marks Each	Procedure	Performance & VIVA VOCE	Practical Notebook	Internal	External	10 Marks each for Theory & Practical	
45 Marks	45 Marks	Marks: 15	Marks: 10	05 Marks	20 Marks	05 Marks	15 Marks	20 Marks	Marks 20	**200 Marks**
45 Minutes	2 Hours 15 Minutes	05 Minutes for Each Station	02 Minutes for each Station	10 Minutes	30 to 60 Minutes					

MBBS Examination Physiology

Table of Specifications (TOS) for Physiology MBBS 2nd Professional

Topics/ Chapter	No. of MCQ's	No. of SEQ's
Renal and body fluids	**10**	**02**
Central nervous system	**16**	**02**
Special senses	**04**	**01**
Endocrinology	**06**	**02**
Reproduction	**04**	**01**
GIT	**05**	**01**
Total	**45**	**09**
Total Marks	**45 Marks**	**45 Marks**

- 25% MCQ's and SEQ's should be clinically oriented or problem based
- 01 Mark for each MCQ's and 05 Marks for each SEQ's.
- 10 Marks are allocated for Internal Assessment.
- Total Marks for Theory Paper : SEQ's + MCQ's + Internal Assessment = **100 Marks (45+45+10=100)**

VIVA VOCE

The student will be evaluated in specified course with relevant questions. Course segment and no. of question for each are given below:

S.No.	Course segment	Marks	Minimum questions
1	Renal and body fluids	05	02
2	Central nervous system	10	03
3	Special senses	05	01
4	Endocrinology	05	02
5	Reproduction	05	01
6	GIT	05	01
Total		**35**	**10**

STAFF CONTACTS

S.NO.	Name of Faculty's Member	Email Address
1	Prof. Dr. Ghazal Mansoor	ghazalmajeed100@gmail.com
2	Prof. Dr .Sana Qanber Abbasi	sanaqanberabbasi@gmail.com
3	Dr. Qurat-ul-Ain	quratkundi@gmail.com
4	Dr. Nazish Jamil	nazishjamil875@gmail.com
5	Dr. Sana Javaid	sana5120@hotmail.com
6	Dr. Asma Siddiqui	asmasiddiqi214@gmail.com
7	Dr. Wajih Malik	drwajihmalik@gmail.com
8	Dr. Fizza Laraib	fizzalaraib23@gmail.com
9	Dr. Aneequa Shafique	aniqasfq225@gmail.com

PRESCRIBED TEXT & REFERENCES BOOKS

Recommended Books:

- Textbook of Physiology by Guyton and Hall, Latest Ed,
- Review of Medical Physiology by William F. Ganong, Latest Ed, published by McGraw –Hill education.
- Physiology Practical Notebook

Reference Books:

- Human Physiology by Laurali Sherwood, Latest Ed, published by Yolando Cossio.
- Physiology by Berne and Levy, latest edition.
- Essentials of Medical Physiology by Prof. Mushtaq Ahmad.
- Physiology by Linda and Costanzo, Latest Ed, published by Elsevier Health Sciences.
- Essential of Medical Physiology (Jaypee), Latest Ed, published by Brothers Medical Publishers.

Department of Biochemistry

PREFACE

This curriculum is designed for medical undergraduates by collaborated effort of all subject specialists across the year to provide medical students of SM&DC a resource material to share important aspects of the curriculum designed by the University of Health Sciences, Lahore.

The main aim is to promote self-regulated and academic learning among students by empowering them to achieve their aims and objectives of medical education. The overarching curricular aspects of undergraduate competencies, assessment policies and names of curriculum coordinators are all included in this guidebook.

By means of careful arrangement amongst the primary subjects taught to first year MBBS, a resourceful alignment has been formatted for a conceptual understanding of these subjects whilst the provision of relevant clinical details ensures the necessary understanding of patient presentation and management.

SMDC aims to improve health indicators of the community and society at a large scale by training their students and doctors in preventive healthcare services and best health education through community outreach programs.

This study guide gives an overview of learning outcomes and objectives in relation to the course contents described. The assessment methodology used for the calculation of students' internal assessment is also provided. It has been prioritized that the entirety of the MBBS curriculum is designed in accordance with guidelines provided by the University of Health Sciences (UHS) and Pakistan Medical Commission (PMC). This is achieved by means of a combined and concentrated effort byof the institutional faculty.
Since curriculum is a living and a dynamic document, therefore it is suggested that it is to be updated and to be improved on yearly basis, using evidence generated through program evaluation and feedback from both students and faculty members. We hope that this humble effort of the contributing faculty will prove to be a guiding light for our dear students.

Regards.

Head of Department
Prof. Dr. Gul-e-Raana
Dated: 23-2-23

List of Contents

TIME ALLOCATION BY PMC FOR ANNUAL ACADEMIC ACTIVITIES

Duration of 2nd Year MBBS Session: 36 Wks.

Total Teaching Hours (as required by PMDC): 200

Topics	Subjects	Duration
Lecture Time	Lectures 140 (2 lectures /week, 45 min 1lecture/week 1hour)	92 hours
Practical Time	Practical 36 (1 practical/week)	72 hours (2hrs/week)
Tutorial Time	SGDs (Small groups discussion)/Tutorial 36 (01 hr /week)	36 hours
Lectures + Practical + Tutorial		200 hours
Total=200 hours		

PLANNED TEACHING ACTIVITIES FOR 2nd YEAR MBBS

DEPARTMENT OF BIOCHEMISTRY

PMDC has allocated 200 hours of teaching in the subject of Biochemistry for the MBBS course. In order to meet this requirement following teaching modules have been planned. The modules have been carefully designed to impart core knowledge of Biochemistry in a way that an undergraduate student can grasp the subject fully and is adequately prepared for examination in any university.

Lectures:

A total of 140 lectures are planned for the entire year in 36 weeks. The lectures will be conducted by the Professor, Associate and assistant professors. The lectures will be interactive and students should actively participate in them to clear their doubts. The students are required to take notes of the lectures and study the topic with the help of prescribed text books.

Practical classes:

The whole class of 100 students divided into 4 batches to conduct the practicals effectively and one batch perform practical per week. Practicals will be conducted by demonstrators under an active supervision of senior instructors. Students are required to enter their work in their practical note books which comprises of the principle procedure observation and interpretations of the current practical and get them checked by the instructors regularly.

Tutorials:

The whole class of 100 students divided into 4 batches to conduct the tutorial effectively and one batch take tutorial in alternate week. Topics for the tutorial will be notified at least one week before the class. The instructors will be deputed for every batch on rotation basis. During this interactive session the students must clear their concepts regarding the topic by actively engaging with their respective teachers.

Small Group Discussion:

Case based learning classes will be conducted from time to time throughout the academic year. A clinical scenario will be discussed with students by dividing them in groups. A senior instructor will be facilitating the discussion in interactive session and students are required to generate the discussion amongst themselves in line with the learning objectives of the topic.

Presentations by the students:

Presentations of the ongoing topic will be conducted throughout the year periodically by the students so as to cover the topic of discussion precisely according to course work designed by UHS and emphasizing its clinical relevance and research relationship. Preferably topics will be allocated to the group of 3-4 students and they will present a very short presentation of 10-15 minutes related to the topic and discuss all the relevant important aspects followed by Q&A session after it.

Training Program for Lecturers

Department of Biochemistry

2nd Year MBBS

General

- Biochemistry is the dynamic, exciting science in which chemistry is applied to the study of the atoms and molecules which comprise living organisms. This includes organic molecules and their chemical reactions. It has revolutionized our understanding of and provides a backbone to modern medicine.
- Biochemistry Department at SM&DC has a unique approach to the biochemical sciences that cultivates critical thinking as well as depth of knowledge by exposing its students to the full spectrum of modern biochemistry. The comprehensive teaching and assessment plan is strategically designed according to the UHS and PMDC syllabi and guidelines to achieve maximum results.
- The strength of Biochemistry Department is its conductive environment and committed staff.
- The vibrant teaching staff is highly qualified with post graduates degrees and certifications along with vast teaching experience. The department's aim is establishment of research culture and encouragement of student participation in it.
- Biochemistry department has a well-equipped laboratory and is managed by qualified and experienced technical staff.

1. METABOLISM OF CARBOHYDRATES

Sr. No.	Title of Lecture	Instructor
1	Introduction and reactions of glycolysis	**Dr. Hassan Jamil**
2	TCA	
3	Gluconeogenesis	
4	Glycogen Metabolism	
5	Metabolism of Monosaccharides and disaccharides	
6	HMP pathway, reactions of uronic acid pathway	
7	Uses of NADPH	
8	Glycosaminoglycans, proteoglycans and glycol proteins	

2. METABOLISM OF LIPIDS

Sr. No.	Title of Lecture	Instructor
1	Oxidation of fatty acids	**Dr. Gul-e-Raana**
2	Steps involved in DeNovo Synthesis of fatty acid	
3	Mobilization of store fats and oxidation of fatty acids	
4	Ketone bodies	
5	Structure synthesis and degradation of phospholipids	
6	Overview of structure synthesis and degradation of glycosphingolipids	
7	Prostaglandins and related compounds	
8	Structure, functions synthesis and fate of cholesterol	
9	Bile acids and bile salts with their clinical significance	
10	Plasma Lipoproteins composition metabolism regulation and classification of HDL, LDL, VLDL and its relation to cardiac disease	

3. METABOLISM OF PROTEINS AND AMINO ACIDS

Sr. No.	Title of Lecture	Instructor
1	Nitrogen Metabolism and its balance	Dr. Gul-e-Raana
2	Amino acid pool &Protein turnover	
3	Transport and fate of amino acids after removal of nitrogen	
4	Reactions of Urea cycle and their regulation	
5	Urea cycle: its biological and clinical significance	
6	Metabolism of ammonia and hyperammonemia	
7	Catabolism of carbon skeleton of amino acid	
8	Biosynthesis of non- essential amino acid	
9	Metabolic defect in amino acids metabolism like phenylketonuria,	
10	Maple syrup disease, Albinism, Homocystinuria and Alkaptonria	

4. BIOENERGETICS AND BIOLOGIC OXIDATION

Sr. No.	Title of Lecture	Instructor
1	Bioenergetics & Energy rich compounds	Dr. Samra Hafeez
2	Organization of Electron Transport Chain	
3	Oxidative phosphorylation & Chemiosmotic hypothesis	
4	Uncouplers and inhibitors of etc	

5. WATER & ELECTROLYTE METABOLISM AND REGULATION OF ACID-BASE BALANCE

Sr. No.	Title of Lecture	Instructor
1	PH and its clinical importance	Dr. Hassan
2	Body buffers and their Role in regulation of acid base balance	
3	Acid-base balance of human body	
4	Metabolic Acidosis and alkalosis	
5	Respiratory Acidosis and alkalosis	
6	Renal regulation of PH and role of kidney	
7	Fluid & belectrolyte balance	

6. BIOCHEMICAL GENETICS (INFORMATIONAL FLOW IN THE CELL)

Sr. No.	Title of Lecture	Instructor
1	Structure of DNA & RNA	Dr. Samra Hafeez
2	Steps in prokaryotic synthesis of DNA	
3	Replication in eukaryotic DNA	
4	DNA repair an its clinical significance	
5	DNA Mutations	
6	Transcription of prokaryotic and eukaryotic genes	
7	Post transcriptional modification	
8	Protein synthesis steps and its inhibitors	
9	Co and posttranslational modifications	
10	Regulation of gene expression	

7. METABOLISM OF NUCLEOTIDES

Sr. No.	Title of Lecture	Instructor
1	Structure DeNovo synthesis & degradation of purine and pyrimidines	Dr. Gul-e-Raana
2	Natural & synthetic derivatives of purines & pyramidines	
3	Diseases associated with purines degradation	
4	Pyrimidine synthesis and degradation and its clinical relevance	

8. BIOCHEMISTRY OF DIGESTIVE TRACT

Sr. No.	Title of Lecture	Instructor
1	Digestion and absorption of macro molecules	Dr. Anam
2	Gastric juice and its clinical significance	
3	Intestinal juices and their biomedical importance	
4	Pancreatic secretion composition	
5	Achlorhydria	
6	Gastro intestinal hormone	

9. INTEGRATION AND REGULATION OF METABOLIC PATHWAYS

Sr. No.	Title of Lecture	Instructor
1	Fed fast cycle and starvation: Introduction and integration of anabolic and catabolic pathways	Dr. Hassan

2	Role of liver, heart, brain, skeletal muscles and adipose tissues in regulation of blood sugar level with role of insulin and glucagon	

10. BIOCHEMISTRY OF ENDOCRINE SYSTEM

Sr. No.	Title of Lecture	Instructor
1	Classification of hormones	**Dr. Samra Hafeez**
2	Overview of mechanism of action of hormones through signal transduction	
3	Feedback mechanism & its regulation	
4	Posterior Pituitary Hormones	
5	Growth hormone & its disorders	
6	Thyroid hormone & its disorders	
7	Adrenal Cortical hormones & its disorders	
8	Adrenal medullary hormones & its disorders	
9	Endocrine part of pancreas	
10	Male sex hormones	
11	Female sex hormones	
12	Hormones of Calcium regulation	

11: METABOLISM OF XENOBIOTICS

Sr. No.	Title of Lecture	Instructor
1	Classes of xenobiotics and their medical relevance	**Dr Anam**
2	Role of xenobiotics in enzyme induction and Metabolism of xenobiotics	
3	Phase 1 reactions	
4	Phase 2 reactions	

12: CANCER BIOLOGY

Sr. No.	Title of Lecture	Instructor
1	Biochemistry of cancer	**Dr Anam**
2	Tumor markers	
3	Free radicals and role of antioxidants	

LIST OF LECTURES IN THE SUBJECT OF BIOCHEMISTRY AND THEIR LEARNING OBJECTIVES

At the end of the course, the students should be able to discuss and describe following topics

S. No.	Title of Lectures with Learning Objectives
1	**METABOLISM OF CARBOHYDRATES** **a) Glycolysis** i. Differentiate reactions of aerobic and anaerobic glycolysis occurring in RBCs and other tissues ii. Discuss biomedical significance and energy yield of aerobic and anaerobic glycolysis

	and its significance and substrate-level phosphorylation iii. Summarize regulation of glycolytic pathway iv. Outline the metabolic fates of pyruvate v. Explain lactic acidosis; genetic deficiency of pyruvate kinase and pyruvate dehydrogenase **b) Tricarboxylic acid (TCA) cycle** i. Draw reactions of TCA cycle and their regulation along with energy yield. ii. Discuss importance of TCA cycle and its amphibolic role **c) Gluconeogenesis** i. Write reactions of gluconeogenesis using pyruvate and glycerol as precursors and regulation of gluconeogenesis. ii. Generalize the important gluconeogenic precursors: Entrance of amino acids, intermediates of TCA cycle, glycerol, and other compounds as gluconeogenic precursors. iii. Biomedical significance of gluconeogenesis: Role of gluconeogenesis in plasma glucose level regulation, and the Cori cycle, and glucose-alanine cycle. **d) Glycogen metabolism** i. Demonstrate synthesis and importance of UDP glucose ii. Compare reactions of glycogenesis and glycogenolysis iii. Review the regulation of glycogenic synthase and glycogen phosphorylase iv. Analyze importance of allosteric regulation of glycogen phosphorylase 'a' (a plasma glucose sensor) by plasma glucose v. Summarize disorders of glycogen metabolism (glycogen storage diseases) **e) The hexose monophosphate pathway and other pathways of hexose metabolism** i. Describe hexose monophosphate (HMP) pathway: Reactions of oxidative and non-oxidative phases of HMP pathway, importance of HMP pathway along with uses of NADPH, and glucose 6-phosphate dehydrogenase deficiency. ii. Explain reactions of uronic acid pathway along with its biologic importance. iii. Metabolism of fructose: Metabolic fate of fructose in human body, sorbitol metabolism along with effect of hyperglycemia on sorbitol metabolism, essential fructosuria and hereditary fructose intolerance. iv. Metabolism of galactose: Metabolic fate of galactosein body and synthesis oflactose: and disorders of galactose metabolism (galactokinase deficiency and classic galactosemia). v) Metabolism of ethanol

	f) Regulation of blood glucose level i. Justify regulation of plasma glucose hormonally (insulin, glucagon, growth hormone, epinephrine, and cortisol) and non-hormonally, and the role of various metabolic pathways in blood glucose level regulation ii. Differentiate between hypoglycemia and hyperglycemia: An overview of hypoglycemia and hyperglycemia, their important causes, and clinical manifestations. iii. Describe diabetes mellitus: Types of diabetes mellitus along with its clinical manifestations, metabolic changes in type 1 and type 2 diabetes mellitus, and diagnosis of diabetes mellitus. iv. Estimation of glucose in blood and other biological fluids and oral glucose tolerance test (OGTT).
2	**METABOLISM OF LIPIDS** a) Describe de novo Synthesis of fatty acid synthesis: Production of cytosolic acetyl CoA, fatty acid synthase multienzyme complex, reactions of cytosolic fatty acid synthesis, elongation of fatty acid chain, synthesis of polyunsaturated fatty acid, and regulation of fatty acid synthesis. b) Draw synthesis and storage of triacylglycerols in body. c) Explain mobilization of stored triacylglycerols along with its regulation d) Review oxidation of fatty acids: Activation of fatty acid, translocation of fatty acyl CoA into mitochondrial matrix, reactions of β-oxidation of saturated and unsaturated fatty acids, energy yield of β-oxidation, fate of acetyl CoA, and other types of fatty acid oxidation (alpha-oxidation, omega-oxidation, and oxidation of odd-carbon fatty acids). e) Illustrate synthesis and utilization of ketone bodies: Reactions of hepatic ketogenesis and utilization of ketone bodies by extrahepatic tissues. f) Define ketoacidosis and regulation of ketogenesis. g) Tabulate synthesis of eicosanoids along with its regulation and biologic functions of eicosanoids. h) Metabolism of phospholipids and sphingolipids: Synthesis of phospholipids (phosphatidylcholine and phosphatidylethanolamine), synthesis of glycerol ether phospholipids (cardiolipin and platelet activating factor), degradation of phospholipids, deficiency of lung surfactant, metabolism of glycolipids, biosynthesis of ceramine, sphingomyelin, and gangliosides, and degradation of sphingolipids along with sphingolipidoses. i) Describe cholesterol metabolism: Reactions and regulation of cholesterol biosynthesis and fate and functions of cholesterol in body. j) Discuss biosynthesis and fate of bile acids and their significance in health and disease. k) Classify plasma lipoproteins: Synthesis, transport, and fate ofchylomicrons, VLDL, IDL, LDL, and HDL; disorders associated with impairment of lipoprotein metabolism,

	and atherogenic effect of oxidized LDL. l)Biochemical defects leading to fatty liver
3	**METABOLISM OF PROTEINS AND AMINO ACIDS** Describe an overview of protein turnover in human body; nitrogen balance (positive and negative). b) IllustratehowInter-organ amino acid exchange in normal post-absorptive state c) Explain degradation of amino acids; removal of nitrogen from amino acids by. Transamination and deamination; sources of ammonia in body; ammonia toxicity; fate of ammonia in body, reactions and regulation of the urea cycle along with metabolic disorders of the urea cycle. d) Write overview of amphibolic intermediates formed from the carbon skeleton of amino acids. e) Differentiate between glucogenic and ketogenic amino acids; metabolism of individual amino acids like glycine, cysteine, arginine, proline, phenylalanine, tyrosine, histidine, tryptophan, and methionine; causes and salient features of important metabolic defects in amino acid metabolism like phenylketonuria, maple syrup urine disease (MSUD), histidinemia, alkaptonuria, cystathioninuria, homocystinuria, hyperprolinemia, cystinuria, cystinosis, tyrosinemia and albinism. f) Outline metabolism of epinephrine and norepinephrine, creatine, creatinine, histamine, gamma-aminobutyrate, serotonin, melatonin, and melanin.
4	**BIOENERGETICS AND BIOLOGIC OXIDATION** a) Discuss endergonic and exergonic reactions, free energy, free energy Change, ATP and other compounds as carriers of energy b) Explain electron transport chain: Components and organization of electron transport chain (ETC) C) Describe reactions of electron transport chain, redox potential, methods of electron transfer among the components of electron transport chain, and energy release during electron transport d) Review oxidative phosphorylation: ATP synthesis in ETC, inhibitors and uncouplers of oxidative phosphorylation, and chemiosmotic hypothesis of oxidative phosphorylation.
5	**WATER & ELECTROLYTE METABOLISM AND REGULATION OF ACID-BASE BALANCE** a) Discuss biochemical mechanisms to regulate water and electrolyte balance in body: Fluid compartments of the body; gain and loss of body water; regulation of body water balance, effect of pure water deprivation, water excess or water intoxication; and electrolytes of body fluids (sodium, potassium, magnesium and chloride).

	b) Explain body buffer systems, role of lung and kidney in maintenance of acid-base balance. c) Compare acid-base disturbance in the body like respiratory acidosis, metabolic acidosis (lactic acidosis and ketoacidosis); respiratory and metabolic, and concept of anion gap, base excess, and base deficit. d) Clinical interpretation of laboratory report of arterial blood gases.
6	**BIOCHEMICAL GENETICS (INFORMATIONAL FLOW IN THE CELL)** a) Explain the structural basis of cellular information b) Define organization of DNA in genome; chromosomes, Karyotyping, nucleosome, introns and exon . c) Discuss replication of DNA: Reactions of DNA replication in eukaryotes and prokaryotes; types of damage to DNA and DNA repair; mutations and cancers d) Explain Transcription (DNA-dependent RNA synthesis): Steps in the transcription of eukaryotic and prokaryotic genes; post-transcriptional modifications (processing) of RNA; reverse transcription in retroviruses and its relation to cancers and AIDS. e) Elaborate translation (protein synthesis): The genetic code; components required for protein synthesis, composition of eukaryotic and prokaryotic ribosomes; steps of protein synthesis; post-translational modifications of polypeptide chains:protein targeting. f)Compare regulation of gene expression in prokaryotes and eukaryotes and gene amplification. g) Elaborate molecular biology techniques: Basic information and biomedical importance of molecular biology techniques; DNA isolation; recombinant DNA technology; DNA cloning; polymerase chain reaction; hybridization; blotting techniques. h) Describe oncogenes and their role in carcinogenesis; mechanisms of activation of proto-oncogenes; mechanism of action of oncogenes; tumor suppressor genes and oncogenic viruses. i) Summarize genetic basis of disease and important tumor markers. j) Important tumor markers and their clinical significance (Carcinoembryonic Antigen, Alpha fetoprotein, human chorionic gonadotropin, calcitonin and prostatic acid phosphatase).
7	**METABOLISM OF NUCLEOTIDES** a) Explain de novo Synthesis of purines and pyrimidines; the salvage pathways of nucleotide synthesis; degradation of purine and pyrimidine nucleotides b) Discuss disorders associated with purine nucleotide metabolism like adenosine deaminase deficiency, gout, purine nucleoside phosphorylase deficiency. c) Write down natural and synthetic derivatives of purines and pyrimidines and their role in health anddisease.
8	**BIOCHEMISTRY OF DIGESTIVE TRACT** a) Discuss introduction, chemical composition, and secretion and regulation of various digestive juices of GIT such as saliva, gastric juice & HCI, pancreatic juice, bile, and succus entericus b) Describe hydrolysis (digestion) of carbohydrates, lipids, proteins, and nucleic acids in gastrointestinal tract c) Explain absorption of carbohydrates, lipids, and amino acids d) Analyze disease states associated with GIT disorders like achlorhydria, peptic ulcers,

	lactose intolerance, cholelithiasis and pernicious anemia, cystic fibrosis and celiac disease. e) Elaborate the site of synthesis and major actions of gastrointestinal hormones like gastrin, cholecystokinin (CCK), secretin, gastric inhibitory peptide (GIP), vasoactive intestinal polypeptide (VIP), motilin, enkephalins, substance P, neurotensin, and enteroglucagon
9	**INTEGRATION AND REGULATION OF METABOLIC PATHWAYS** a) Fed-fast cycle and starvation. b) Summarize basic concepts of intermediary metabolism, introduction of anabolic and catabolic pathways c) Generalized overview of regulation and integration of various metabolic pathways(role of liver, heart, brain, skeletal muscle and adipose tissue)and overview of metabolic diseases including inborn errors of metabolism
10	**BIOCHEMISTRY OF ENDOCRINE SYSTEM** a) Summarize an overview of endocrine system; classification of hormones; mechanisms of action each class of hormone; general characteristics of various types of hormone receptors; types and actions various kinds of G-proteins in mediating the actions of hormones; signal transduction pathways of various hormones; types and role of various kinds of second messengers b) Review pituitary and hypothalamic hormones: Structure, synthesis, mechanisms of action, biologic actions of all hypothalamic and pituitary hormones; disorders associated with hyper- and hypo-activities of these hormones such as growth hormone deficiency (dwarfism), gigantism, acromegaly, Cushing's syndrome, Addison's disease, diabetes insipidus, and the inappropriate secretion of ADH (SIADH). c) Describe the structure, biosynthesis, and secretion, transport, mechanism of action, biologic role and metabolism of thyroid hormones; regulation of thyroid gland activity; pathologic conditions associated with altered thyroid function like goiter, hypothyroidism, hyperthyroidism, Graves' disease. d) Outline Calcium regulating hormones. Discuss structure, synthesis, secretion, transport, mechanism of action, and biologic actions of parathyroid hormone; disorders associated with hyper- and hypo-activities of these hormones like;role of parathyroid hormone, calcitriol, and calcitonin in calcium homeostasis; hypoparathyroidism, hyperparathyroidism (primary, secondary, and tertiary), pseudohypoparathyroidism, rickets, and osteomalacia. e) Describe structure, biosynthesis, secretion, transport, regulation, catabolism, mechanisms of action and biologic effects of adrenal cortical hormones; disorders associated with hyper- and hypo-activities of these hormones like Cushing's syndrome, secondary adrenal deficiency, Addison's disease, primary aldosteronism and secondary aldosteronism. f) Review structure, biosynthesis, transport, release, mechanisms of action, regulation, biologic effects, and catabolism of the adrenal medullary hormones; and associated disorders like pheochromocytoma g) Explain biosynthesis/control, mechanisms of action, and biologic actions of male and female gonadal hormones; disorders associated with hypergonadism and hypogonadism in males and females. h) Describe structure, synthesis, secretion, transport, mechanisms of action , catabolism and biologic actions of pancreatic hormones (insulin, glucagon, somatostatin and

	pancreatic polypeptide)disorders associated with hyper- and hypo-activities of these hormones like; pathophysiology of insulin deficiency and diabetes mellitus, regulation of insulin secretion; insulin receptor; structure and biologic functions of somatostatin and pancreatic polypeptide i) Write site of synthesis and major actions of gastrointestinal hormones like gastrin, cholecystokinin (CCK), secretin, gastric inhibitory peptide (GIP), vasoactive intestinal polypeptide (VIP), motilin, enkephalins, substance P, neurotensin, and enteroglucagon.
11	**METABOLISM OF XENOBIOTICS** a) Define and explain the main classes of xenobiotics of medical relevance; their phases of metabolism and clinical significance (Cytochrome P450: Cytochrome P450 hydroxylase cycle in microsomes; role of cytochrome P450 in phase I metabolism of xenobiotics; induction of cytochrome P450) b)What arePhase II metabolism of xenobiotics; types of phase II reactions; c) Explain responses to xenobiotics including pharmacologic, toxic, immunologic and carcinogenic effects
12	**CANCER BIOLOGY** a) Describe the biochemical changes occurring in a cell b) Role of different proteins acting as tumor markers c) How does free radicals are produced and the role of antioxidants to combat their deleterious effects

LIST OF PRACTICAL FOR 2nd YEAR MBBS

Sr. No.	Topic	Practical
1	**Instrumentation in clinical biochemistry**	pH Meter Centifugation and centrifuge machine Chromatography Electrophoresis Flame photometry Spectrophotometer Pipettes
2	**Estimation of Lipid Profile**	Tests to determine the concentration of total serum Cholesterol, Serum triacylglycerol HDL Cholesterol VLDL and LDL Cholesterol
2	**Estimation of Blood Chemistry**	Collection and preservation of blood samples Determination of oral glucose tolerance test and glucose challenge test. Tests to determine the blood glucose level by oxides method
3	**Estimation of total plasma proteins**	Tests to determine the concentration of total proteins in plasma Tests to determine the concentration of total albumin in plasma
4	**Renal function test**	Determination of plasma uric acid by different methods Enzymatic (uricase) method Phosphtungstic acid method Estimation of blood urea Estimation of Serum Creatinine Determination of Creatinine clearance
5	**Estimation of serum calcium**	Determination of serum calcium levels.
7	**Liver function test**	Determination of activities of Alanine Aminotransferase (ALT/SGPT) Estimation of serum Aspartate Transaminase AST / SGOT Estimation of alkaline phosphatase in plasma. Estimation of plasma bilirubin
8	**Other Blood Test**	Estimation of serum Amylase Determination of serum Sodium, Potassium and chloride levels
	Cardiac Enzymes	Estimation of Serum Creatine kinase Estimation of Serum LDH

Time Table

SHARIF MEDICAL & DENTAL COLLEGE

TIME TABLE, 2ndYEAR MBBS (Session 2022 - 2023)

Notified - 25-01-2023 S.M&D.C No/MS/-56/Path/3297-23/2023 Dated: 22-01-2023

Day & Time	08:30am - 09:15am	09:15am - 10:00am	10:00am - 11:00am	11:00am - 11:30pm	11:30am - 12:30pm	12:30pm - 02:30pm
Monday	Biochemistry Lecture Lecture Hall 1	Physiology Lecture Lecture Hall 1	Clinical Lecture Medicine Lecture Hall 1	**Break**	Self Direct Learning Dissection Hall	Histology Practical Physiology Practical B Biochemistry Practical C Tutorial Physiology / Biochemistry (SGD) D (alternate weeks) Demonstration Room No. 1 - 1
Tuesday	Physiology Lecture Lecture Hall 1	Self Direct Learning Anatomy Lecture Hall 1	Patient Safety Lecture (31st Jan & 7th Feb) Clinical Lecture Surgery (14th Feb - End of Session) Lecture Hall 1	**Break**	Anatomy Dissection / Demonstration (SGD)	Histology Practical D Physiology Practical C Biochemistry Practical B Tutorial Physiology / Biochemistry (SGD) A (alternate weeks) Demonstration Room No. 1 - 1
Wednesday	Physiology Lecture Lecture Hall 1	Histology Lecture Lecture Hall 1	**10:00am - 10:30am** **Break**	**10:30am - 12:30pm** Histology Practical C Physiology Practical D Biochemistry Practical A Tutorial Physiology / Biochemistry (SGD) B (alternate weeks) Demonstration Room No. 1 - 1		**12:30pm - 01:30pm** Behavioral Sciences Lecture Lecture Hall 1 / **01:30pm - 02:30pm** Physiology Lecture Lecture Hall 1
Thusrday	**08:30am - 09:30am** Anatomy Lecture Lecture Hall 1	**09:30am - 10:15am** Clinical Lecture Research Methodology (2nd February - 20th April) Nephrology (27th April - 10th August) Gynae & Obs. (17th August - 21st September) Neurosurgery (28th September - End of Session) Lecture Hall 1		**10:15am - 10:45am** **Break**	**10:45am - 11:45am** Self Direct Learning Physiology Lecture Hall 1	**11:45am - 12:30pm** Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Library) Roll No. 51 - 100 (Demo Room 0 - 2) / **12:30pm - 02:30pm** Histology Practical B Physiology Practical A Biochemistry Practical D Tutorial Physiology / Biochemistry (SGD) C (alternate weeks) Demonstration Room No. 1-1
Friday	**08:30am - 09:30am** Biochemistry Lecture Lecture Hall 1	**09:30am - 10:30am** Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Demonstration Room 1 - 5) Roll No. 51 - 100 (Library)		**10:30am - 11:45am** Anatomy Dissection / Demonstration (SGD)	**11:45am - 12:30pm** Physiology Lecture Lecture Hall 2	----------
Saturday	**08:30am - 09:15am** Islamiyat / Pak. Studies Lecture Hall 1	**09:15am - 10:00am** Biochemistry Lecture Lecture Hall 1	**10:00am - 10:30am** **Break***	**10:30am - 11:45am** Behavioral Sciences Lecture* Lecture Hall 3	**11:45am - 12:30pm** Self Direct Learning Physiology Lecture Hall 3	**12:30pm-01:30pm** Self Direct Learning Dissection Hall / **01:30pm - 02:30pm** Anatomy Dissection / Demonstration (SGD)

Copy Forwarded To:

1: Dr. Muhammad Adnan Khan Chief Executive SMC
2:Principal SMDC
3:Principal, College of Dentistry
4:Heads of all concerned Departments
5:Director Administration
6: Notice Boards

*** Amendments in Time Table ONLY for 2nd Saturday of every month.**

1. Break 10:00am - 10:15am
2. Mentorship Session 10:15am - 11:00am
3. Behavioral Sciences Lecture 11:00am - 11:45am

Prof. Maria Aslam
Head Deptt. of Pathology
Chairperson Time Table Committee

ASSESSMENT PLAN

DEPARTMENT OF BIOCHEMISTRY

SHARIF MEDICAL & DENTAL COLLEGE LAHORE

Following modes of assessment are planned for 2nd year MBBS class in the subject of Biochemistry. This plan has been designed keeping in view the university curriculum and hopefully will facilitate the students is preparing for 1st professional examination in the subject.

Chapter Tests:

These will be conducted at the completion of every chapter. The test will comprise of MCQs and SEQs on the pattern of university examinations. A preparatory time of at least 10 days shall be given prior to these tests. Each test will be followed by viva voce, for which the class will be divided into smaller batches.

Pre-Tutorial Tests:

Tutorial topics will be notified minimum one week before the tutorial class. A small test of 10-15 minutes duration, comprising of MCQs and true or false statements will be held before the start of each tutorial. The topic will be then discussed by a senior instructor in detail. This will be an interactive session. The paper of the PTT will be marked by demonstrators in quick time and the papers will be returned before the conclusion of each class.

OSPE Tests:

In order to prepare the students for practical examinations at least two OSPE tests will be conducted on the pattern of university examinations.

Term Tests:

Two term tests shall be conducted in coordination with other subjects. This will comprise of theory, practical and viva segments and a sizeable portion of the total course will be included in each of them.

Pre-annual Exam:

This will be undertaken in coordination with other departments, exactly following the format of university professional examinations. It will comprise of MCQs, SEQs, OSPE and Viva Voce.

Internal Assessment:

Internal assessment will be calculated out of 20 on the basis of all these tests that will be conducted throughout the year.

Distribution of Marks in the subject of Biochemistry

MBBS 2nd Professional

Theory

Internal Assessment	MCQs	SEQs	Total
10	45	45	100

Practical & Viva Voce

Internal Assessment	Viva Voce	OSPE	Practical Copy	Total
10	50	35	5	100

Staff Contacts

Biochemistry Department

SMDC, Lahore

Sr. No	Name	Email Address
1	Prof. Dr. Gul-e-Raana	guleraana60@gmail.com
2	Prof. Dr. Samra Hafeez	dr.samraisrar1993@gmail.com
3	Dr. Hassan Jameel	biohassan86@gmail.com
4	Dr. Anam Rehman	anamrana492@gmail.com
5	Dr Sana Fatima	sannazainn@gmail.com
6	Dr Haseeb	haseebafzal1533@gmail.com
7	Dr Hadeeqa	hadiqasaeed3@gamil
8	Dr Abdul Rehman	abzain7225355@gmail.com

Table of Specifications for Biochemistry Theory Paper
MBBS First Professional Examination (Part-II)

CONTENTS		SEQs	MCQs
1.	Bioenergetics and biologic oxidation	0.5	2
2.	Carbohydrate Metabolism	1.5	6
3.	Lipid metabolism	1.5	6
4.	Metabolism of proteins and amino acids	1.5	6
5.	Metabolism of purines, pyrimidiens, and nucleotides	0.5	2
6.	Replication of DNA, mutations, and DNA repair	0.5	3
7.	Transcription, RNA processing and proteins synthesis Regulation of gene expression, genetic diseases, and basic techniques used in molecular genetics	0.5	3 3
8.	Endocrinology	1.0	6
9.	Biochemistry of digestive juices of GIT, digestion and absorption in GIT	0.5	3
10.	Oncogenesis and metabolism of xenobiotics	0.5	3
11.	Water & electrolyte balance; acid-base regulation	0.5	2
Total items		**9 SEQs**	**45 MCQs**
Total Marks (5 marks for each SEQ and 1 mark for each MCQ)		**45 marks**	**45 marks**

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

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

Total Marks for Theory Paper: *SEQ+ MCQ+ Internal Assessment=*
*45+ 45+ 10=**100 Marks***

Table of Specifications for Biochemistry Oral & Practical Examination
MBBS First Professional Examination (Part-II)

Oral and Practical Examination carries 100 marks

Examination Component	Marks
A- Internal Assessment	10
B- Practical Notebook/Manual (Internal Examiner)	05
C- Viva voce a. External examiner: 25 Marks b. Internal Examiner: 25 Marks	50
D- OSPE a. ***Observed stations (6 Marks):*** There are two observed stations; 3 marks for each station – time allowed is 3 minutes for each observed station) b. ***Non-observed stations (16 Marks):*** There are eight non-observed stations; 2 marks for each station – time allowed is 2 minutes for each non-observed station.	22
E- Practical a. Principle, supposed calculation, etc: 4 Marks (External Examiner) b. Performance of the experiment: 4 Marks (Internal Examiner) c. Structured table viva: 5 Marks (External Examiner)	13

Prescribed Text books & References

RECOMMENDED BOOKS

• Lippincott's Illustrated Reviews: Biochemistry by Harvey R and Ferrier D, Latest Ed, published by Lippincott Williams & Wilkins
• Harper's Illustrated Biochemistry by Murrary RK, Granner DK and Rodwell VW, Latest Ed, McGraw Hill
• Marks' Basic Medical Biochemistry – A Clinical Approach, by smith C, Marks AD, and Lieberman M. Latest Ed. Published by Lippincott Williams & Wilkins
• An introduction to practical Biochemistry by D.T. Plurnor.

REFERENCE BOOKS

• Textbook of Biochemistry 'with Clinical Correlations by Devlin TM, latest edition, published by Wiley-Liss
• Biochemistry by Berg JM, Tymoczko JL, and Stryer L, latest edition, published by W.H. Freeman and Company
• Clinical Chemistry and Metabolic Medicine by Martin A. Crook, latest edition, Edward Arnold (Publishers) Ltd
• Lehninger Principles of Biochemistry by David L Nelson and Michael M. Cox
• Tietz Textbook of Clinical Chemistry by Burtis CA and Ashwood ER published by Saunders.
• Fundamentals of Biochemistry Life at Molecular Level by Donald Voet, Judith G Voet and Charlotte W. Pratt

Head of Department
Prof. Dr. Gul-e-Raana

Research Methodology

PREFACE

Study guides can make a major contribution to learning. They are sometimes likened to a tutor sitting on the student's shoulder-available 24 hours a day to advise the student what he/she should be doing at any stage in their study. Study guides are different from textbooks. They apprise the student at the beginning of an academic session about the course outline, the teaching methodology to be followed throughout the year, learning objectives of each academic activity and the assessment methodology to be followed in an academic session.

At SMDC we follow the annual academic schedule in which the subject of Community Medicine is taught in the fourth academic year of a medical student. Keeping in view the mission of UHS, Lahore and vision of our institute we have designed a training program which is intensive and at the same time interesting for the young minds. This guide includes details about various teaching activities which are to take place throughout the academic year along with the time allocation of each. A list of lectures to be conducted in this session with names of the instructors is attached. Broad learning outcomes of every section of the course accompanied by specific learning objective of every lecture are also included. A complete list of research and field work to be carried out in the community is part of this document. Details of various assessments and testing methodology are included and marks distribution for the subject in the 3rd Professional examinations has been given. Names and email contacts of faculty have also been mentioned to foster better interaction between the teacher and the taught. A list of prescribed text and reference books forms part of this study guide. Since this document is the first of its kind we intend to improve upon it in light of the student-feedback every year. For now happy reading.

Dr. Muhammad Shahid Iqbal

MBBS, FCPS, MCPS, DCH

Prof. & HOD of Community Medicine

Sharif Medical and Dental College,

Lahore

Date: 18-03-2023

LIST OF CONTENTS

TIME ALLOCATION FOR ACADEMIC ACTIVITIES

Duration of 2nd Year MBBS Session: 10 Wks

Total Teaching Hours (as required by PMDC): 20 hours

PLANNED TEACHING ACTIVITIES FOR 2nd YEAR MBBS

RESEARCH METHODOLOGY

PMDC has allocated 20 hours of teaching in the subject of Community Medicine for the MBBS course. In order to meet this requirement following teaching modules have been planned. These modules have been carefully designed to impart core knowledge of Community Medicine in a manner that an undergraduate student can grasp the subject fully and is adequately prepared for university examinations.

Lectures:

A total of 10 lectures are planned for the entire year. The lectures will be conducted by the Professor, associate and assistant professors or by senior lecturers that have completed their post- graduation in the subject of Community Medicine. The lectures will be interactive and students should actively participate in them to clear their doubts. The students are required to take notes of the lectures and study the topic with the help of prescribed text books in light of the learning objectives of the topic enunciated by the teacher at the beginning of each lecture.

TRAINING PROGRAM FOR LECTURES

RESEARCH METHODOLOGY

2nd YEAR MBBS CLASS

GENERAL:

- To prepare them to function as community and first level physicians in accordance with the institutional goals.
- To teach research principles and methodologies so as to create scientific attitude.

LIST OF LECTURES IN THE SUBJECT OF COMMUNITY MEDICINE AND THEIR LEARNING OBJECTIVES

RESEARCH METHODOLOGY

2nd YEAR MBBS CLASS

Topic/ Theme	Learning Outcomes	Learning Objectives/ Contents	Instructional strategies	Assessment Tool
Quantitative and qualitative research	Differentiate quantitative and qualitative research methodology and its applications.	Quantitative research and its applications Qualitative research methodology	LGIS/ SGD	MCQ/ SEQ
Study designs	Classify study designs with relation to hierarchy of evidence	Observational study Cross-sectional study Case-control study Interventional study	LGIS/ Group assignment	MCQ/ SEQ
Study population and its selection	Able to select study population and sample as per defined criteria	Population Sample Inclusion and exclusion criteria for selection of patients	LGIS/ SGD	MCQ/ SEQ
Sampling techniques	Use different sampling techniques in research	Probability and non-probability sampling. Types of sampling techniques	LGIS/ Group assignment	MCQ/ SEQ
Ethical issues in research	Apply ethical principal to resolve issues for human research	Helsinki declaration, Hippocratic oath Ethical issues in research Elements of informed consent	LGIS/ SGD	MCQ/ SEQ

Research ethics	Understand ethical concerns relating to different aspects of research organization	Ethical issues relating to researcher, participants and sponsoring organization Institutional review board	LGIS/ SGD	MCQ/ SEQ
Data collection method	Formulate research questionnaire	Data collection procedure Study questionnaire	LGIS/ SGD	MCQ/ SEQ
Descriptive data analyses	Enter data and do descriptive data analysis on SPSS	Introduction to SPSS data entry and analyses software, data frequency tables, graphs, charts	workshop	MCQ/ SEQ
Statistical Data analyses,	Apply basic state tests on the research data	Parametric tests Non - parametric tests	Statistical Data analyses,	Able to do descriptive f data analysis SPSS Apply basic state tests
Proposal writing	Prepare a research proposal	Introduction, Objectives Hypothesis methodology, Statistical analysis	Group assignment	Internal assessment by community dept

TIME TABLE

SHARIF MEDICAL & DENTAL COLLEGE

TIME TABLE, 2ndYEAR MBBS (Session 2022 - 2023)

Dated:- 25-01-2023 S.M&D.C No/157-56/Path/3397-23/2023 Dated: 22-01-2023

Day & Time	08:30am - 09:15am	09:15am - 10:00am	10:00am - 11:00am	11:00am - 11:30pm	11:30am - 12:30pm	12:30pm - 02:30pm
Monday	Biochemistry Lecture Lecture Hall 1	Physiology Lecture Lecture Hall 1	Clinical Lecture Medicine Lecture Hall 1	**Break**	Self Direct Learning Dissection Hall	Histology Practical Physiology Practical B Biochemistry Practical C Tutorial Physiology / Biochemistry (SGD) D (alternate weeks) Demonstration Room No. 1 - 1
Tuesday	Physiology Lecture Lecture Hall 1	Self Direct Learning Anatomy Lecture Hall 1	Patient Safety Lecture (31st Jan & 7th Feb) Clinical Lecture Surgery (14th Feb - End of Session) Lecture Hall 1	**Break**	Anatomy Dissection / Demonstration (SGD)	Histology Practical D Physiology Practical C Biochemistry Practical B Tutorial Physiology / Biochemistry (SGD) A (alternate weeks) Demonstration Room No. 1 - 1
Wednesday	Physiology Lecture Lecture Hall 1	Histology Lecture Lecture Hall 1	**10:00am - 10:30am** **Break**	**10:30am - 12:30pm** Histology Practical C Physiology Practical D Biochemistry Practical A Tutorial Physiology / Biochemistry (SGD) B (alternate weeks) Demonstration Room No. 1 - 1		**12:30pm - 01:30pm** Behavioral Sciences Lecture Lecture Hall 1 / **01:30pm - 02:30pm** Physiology Lecture Lecture Hall 1
Thusrday	**08:30am - 09:30am** Anatomy Lecture Lecture Hall 1	**09:30am - 10:15am** Clinical Lecture Research Methodology (2nd February - 20th April) Nephrology (27th April - 10th August) Gynae & Obs. (17th August - 21st September) Neurosurgery (28th September - End of Session) Lecture Hall 1		**10:15am - 10:45am** **Break**	**10:45am - 11:45am** Self Direct Learning Physiology Lecture Hall 1	**11:45am - 12:30pm** Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Library) Roll No. 51 - 100 (Demo Room 0 - 2) / **12:30pm - 02:30pm** Histology Practical B Physiology Practical A Biochemistry Practical D Tutorial Physiology / Biochemistry (SGD) C (alternate weeks) Demonstration Room No. 1-1
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Copy Forwarded To:

1: Dr. Muhammad Adnan Khan Chief Executive SMC
2:Principal SMDC
3:Principal, College of Dentistry
4:Heads of all concerned Departments
5:Director Administration
6: Notice Boards

*** Amendments in Time Table ONLY for 2nd Saturday of every month.**

1. Break 10:00am - 10:15am
2. Mentorship Session 10:15am - 11:00am
3. Behavioral Sciences Lecture 11:00am - 11:45am

Prof. Maria Aslam
Head Deptt. of Pathology
Chairperson Time Table Committee

RESEARCH METHODOLOGY
Sharif Medical & Dental College, Lahore
Academic Calendar 2023
2nd Year MBBS (2nd Feb. to 20th April 2023)
Doctor's Name: Prof. Shahid Iqbal

Lec. No.	Date	Day	Time	Lectures Topics	Sub-Topics
1	2-Feb-23	**Thursday**	09:30-10:15	**Research Methodology**	Quantitative research and its applications, Quantitative research Methodogy
2	9-Feb-23	**Thursday**	09:30-10:15		Observational study crosssectional study case-control study interventional study
3	16-Feb-23	**Thursday**	09:30-10:15		Population sample inclusion and exclusion criteria for selection of patients
4	23-Feb-23	**Thursday**	09:30-10:15		Probability and non-probability sampling. Types of sampling techniques
5	2-Mar-23	**Thursday**	09:30-10:15		Helsinki declaration, Hippooratic oath etheical issues in research. Elements of informed consent
6	9-Mar-23	**Thursday**	09:30-10:15		Introduction to SPSS data entry and analysis software, data frequency tables, graphs, charts.
7	16-Mar-23	**Thursday**	09:30-10:15		Parametric tests Non parmetric tests.
8	30-Mar-23	**Thursday**	09:30-10:15		Ethical issues relating to researcher, participants and sponsoring organization insitutional review
9	13-Apr-23	**Thursday**	09:30-10:15		Data collection precedure study questionnaire
10	20-Apr-23	**Thursday**	09:30-10:15		Intoduction objectives, Hypothesis methodology, Statistical analysis

2nd YEAR MBBS

RESEARCH METHODOLOGY

ASSESSMENT PLAN

RESEARCH METHODOLOGY

SHARIF MEDICAL AND DENTAL COLLEGE LAHORE

TESTS

Multiple choice question and short essay question test will be used after completing each chapter to assess the learning of knowledge. These all assessment exercises will be formative. The written tests like Multiple-Choice Questions (MCQs) and Short-Essay Questions (SEQs) test formats are used for the assessment of cognitive domain. The MCQs are more objective and essentially select type of item response format. The SEQs are more subjective and have a supply or construct type item response format and can effectively assess problem solving skills.

Assignments / Research / Practical Journal

Students will be given assignment of different nature such as research and literature search and surveys and report writing of field visits and household surveys.

STAFF CONTACTS RESEARCH METHODOLOGY

Sr. No.	Name	e-mail id
01	Dr. Muhammad Shahid Iqbal	shahidiqbaliph@gmail.com
02	Dr. Samina Khalid	saminakhalid83@yahoo.com
03	Dr. Amna Iqbal Butt	dr_amnawaqas@hotmail.com
04	Dr. Rabia Younis	rabiayounis74@gmail.com
05	Dr. Laila Afzal	lailaafzal333@gmail.com
06	Dr. Ammara Riaz	docammara2@gmail.com
07	Dr. Maham Fatima	fatimamaham96@outlook.com

PRESCRIBED TEXT BOOKS & REFERENCES

1. Text book of Community Medicine by Park J E. Latest Edition
2. Text book of Community Medicine. 6th Ed. by Ilyas Ansari.
5. Online Journals and Reading Materials through HEC Digital Library Facility.

Department of Medicine

PREFACE

Dear students, this study guide is an effort from your college and department of Internal Medicine to facilitate you in improving your understanding and knowledge of this subject and improving your learning as well as performance. This handbook is designed to make you familiar with the subject, learning objectives, detailed plans of lectures & clinical classes, assessments, and detailed course contents.

The noble purpose of making you a competent, responsible, knowledgeable, lifelong learner and ethical doctor will only be possible if you work hard and pay extra attention, take keen interest and make untiring efforts to understand and practice not only the subject of Internal Medicine but your whole curriculum. You can make this possible with your discipline, punctuality, attention, dedication, and self-organization. You are always welcome to come to the department for anything concerning your understanding of the subject or any academic difficulty you face.

“This document is an outline provided for the guidance of the students to learn & understand Medicine well. Students must clearly understand that no book can completely cover the vastness of the subject of Medicine. Students need to study a variety of books / literature in addition to all the teachings & trainings he/ she receives from the teachers to become a good physician.”

We from the department of Internal Medicine, Sharif Medical and Dental College wish and pray for your success in future.

May Allah the Greatest of All, helps you and us in achieving this. Ameen.

Department of Internal Medicine
Sharif Medical and Dental College
Lahore

GENERAL STUDENT LEARNING OBJECTIVES

The MBBS medical students at the end of the undergraduate training program in the subject of Internal Medicine should possess essential knowledge, skills and attitude in order to enable them to:

1. Take comprehensive history, perform detailed physical examination and make a probable diagnosis with a list of differential diagnoses.
2. Devise an investigation plan, interpret the information and apply his knowledge.
3. Suggest a treatment plan for patients.
4. Apprehend and diagnose possible complications.
5. Document all aspects properly and timely.
6. Write and present the cases.
7. Identify medical diseases presenting in out-patients, in-patients and emergency departments.
8. Provide primary health care, at the community level.
9. Perform essential medical emergency and planned procedures.
10. Communicate and counsel effectively with the patient, their families and the community, regarding disease and its relevant issues.
11. Understand medical ethical issues and their application in reference to Internal Medicine.
12. Maintain the confidentiality of the patient.
13. Counsel patients and families regarding common medical problems.
14. Guide the patients and families regarding rehabilitation.
15. Understand the prevalence and prevention of the common Public Health Problems related to Internal Medicine in the community.
16. Understand the principles of medical research including medical writing.
17. Understand the fundamentals of Information Technology and basic computer soft wares.
18. Understands the principles of sterilization and disinfection techniques to prevent infections to the patients and save himself or herself from patients.
19. Be a life-long self-directed learner.
20. Exhibit Professionalism.
21. Competent in Preventive Medicine.

TABLE OF CONTENTS

INTRODUCTION

Medicine is one of the most important subject in the whole MBBS curriculum. It is called as the mother of all subjects, as no one can become a good doctor unless he or she is competent in the Medicine. Although clinical orientation is started from the very first day with names and terminologies being used in basic subjects and the correlations of all the basic subjects with Medicine. Especially Physiology, Pathology, Pharmacology and Community Medicine is closely related to Medicine.

Medicine is a very vast subject and is taught in three years. Main teaching of the subject is started in third year MBBS, when lectures and clinical classes on Medicine are started, and students start seeing real patients daily. The importance can be understood with the fact that a medical student has to learn Medicine in three years, as being a huge subject. This teaching is gradually increased in fourth year and full emphasis in final year. no student can grasp sufficient understanding and knowledge on the subject, unless he /she starts learning it from the beginning.

Medicine has many subspecialties like Cardiology (related to cardiovascular system), Gastroenterology & Hepatology (gastrointestinal tract & liver), Pulmonology (respiratory system), Endocrinology (endocrine glands), Neurology (Nervous system), Nephrology (Kidneys), Psychiatry (mind), Dermatology (skin), Rheumatology (muscles, bones, joints), Hematology (blood), and many more.

The course of the Medicine is designed to match the importance it has, for not only becoming a medical graduate but throughout the life of a doctor.

The faculty of the Medicine Department at Sharif Medical & Dental College, Lahore:

- **Prof. Ayub Latif Khawaja** – Professor & Head of the Department
- **Prof. Taj Jamshad** – Professor of Medicine
- **Prof. Uzma Ahsan** – Professor of Dermatology
- **Dr. Aftab Rabbani** – Associate Professor of Medicine
- **Dr. Imran Johar** – Associate Professor of Medicine
- **Dr. Faisal Masood**– Assistant Professor of Medicine
- **Dr. Ahsan Mushtaq-**Senior Registrar of Medicine
- **Dr. Amina Malik** –Professor of Neurology
- **Dr.Ayaz M Khan** – Assistant Professor Psychiatry

COURSE OUTLINE:

SECOND YEAR MBBS

The 2nd year MBBS, will be continued with addition of teaching actual textbook Medicine in lectures, especially Psychiatry, Dermatology and one or two systems of Internal Medicine. In clinical classes students are expected to perform history taking, documentation, presentation and examination under supervision, to pick up the abnormal findings and make a differential diagnosis.

TEACHING HOURS:

Second Year MBBS

Lectures	1/ Week
Total Lectures	30 Lectures
Total Lectures Hours	30 Hours / Year
Total Teaching Hours	30 Hours / Year

MODES OF INFORMATION TRANSFER

LECTURES:

Lectures of students of 2nd year MBBS are taken at the lecture halls of main college building according the annual devised schedule or academic calendar.

- **Clinical Tutorials**
- **Clinico-pathological Conference**

TEACHING SCHEDULE OF Second YEAR MBBS (2022-23):

There will be one lecture of Medicine & Allied every week in 2nd year MBBS. This lecture will be covering three very important aspects orient the students regarding clinical aspects of Medicine at a very basic and initial level. They will be taught history taking, history writing & history presentation, general and systemic physical examinations, especially their theoretical aspects. The first 19 weeks these lectures will be taken by department of Medicine and later 19 lectures by department of Surgery.

Tutors:

- Professor Dr Taj Jamshad

Time Table

SHARIF MEDICAL & DENTAL COLLEGE

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*** Amendments in Time Table ONLY for 2nd Saturday of every month.**
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3. Behavioral Sciences Lecture 11:00am - 11:45am

Prof. Maria Aslam
Head Deptt. of Pathology
Chairperson Time Table Committee

Department of Medicine
Sharif Medical & Dental College, Lahore
Academic Calendar 2023
2nd Year MBBS
Doctor's Name: Prof. Taj Jamshed, Dr. Anam Jamil

Lec. No.	Date	Day	Time	Lectures	
				Topics	Sub-Topics
1	6-Feb.23	Monday	10:00-11:00		Meningitis
2	13-Feb.23	Monday	10:00-11:00		Encephalitis
3	20-Feb.23	Monday	10:00-11:00		Bel's Palsy
4	27-Feb.23	Monday	10:00-11:00		Peripheral Neuropathy
5	6-Mar.23	Monday	10:00-11:00		UMN & LMN Lesion
6	13-Mar.23	Monday	10:00-11:00		Epilepsy
7	20-Mar.23	Monday	10:00-11:00		Facial Pain
8	27-Mar.23	Monday	10:00-11:00		Headache
9	10-Apr.23	Monday	10:00-11:00		Parkinson’s disease
10	17-Apr.23	Monday	10:00-11:00		Dyspepsia
11	24-April.23	Monday	10:00-11:00	Medicine	Peptic ulcer
12	8-May.23	Monday	10:00-11:00		Test
13	15-May.23	Monday	10:00-11:00		GERD
14	22-May.23	Monday	10:00-11:00		Jaundice
15	29-May.23	Monday	10:00-11:00		Celiac Disease,
16	5-Jun.23	Monday	10:00-11:00		Hirsch sprung Disease
17	12-Jun.23	Monday	10:00-11:00		Diarrhea
18	17-Jul.23	Monday	10:00-11:00		Dwarfism,
19	24-Jul.23	Monday	10:00-11:00		Gigantism,
20	31-Jul.23	Monday	10:00-11:00		Acromegly
21	7-Aug.23	Monday	10:00-11:00		Hyperthyroidism
22	21-Aug.23	Monday	10:00-11:00		Hypothroidism
23	28-Aug.23	Monday	10:00-11:00		Osteomalacia,
24	4-Sep.23	Monday	10:00-11:00		Osteoporosis,
25	11-Sep.23	Monday	10:00-11:00	Medicine	Rickets
26	18-Sep.23	Monday	10:00-11:00		Disorders of Adrenal Gland
27	25-Sep.23	Monday	10:00-11:00		Diabetes Mellitus
27	02-Oct.23	Monday	10:00-11:00		Arthiritis
27	9-Oct.23	Monday	10:00-11:00		Test

FEEDBACK:

The teaching faculty will give constructive feedback on the performance of the students. This will be individual in clinical classes and collective in class tests and mega tests (however students who fail to perform good in tests or those who want to know about their performance may be given individual feedback). Students should take all the feedbacks in positive spirit & attitude to find out the level of their performance, areas where they need improvements and suggestions and guidance from the teachers, how to improve the weaknesses etc. the sole purpose of feedbacks is to improve the learning of students.

ATTENDANCE:

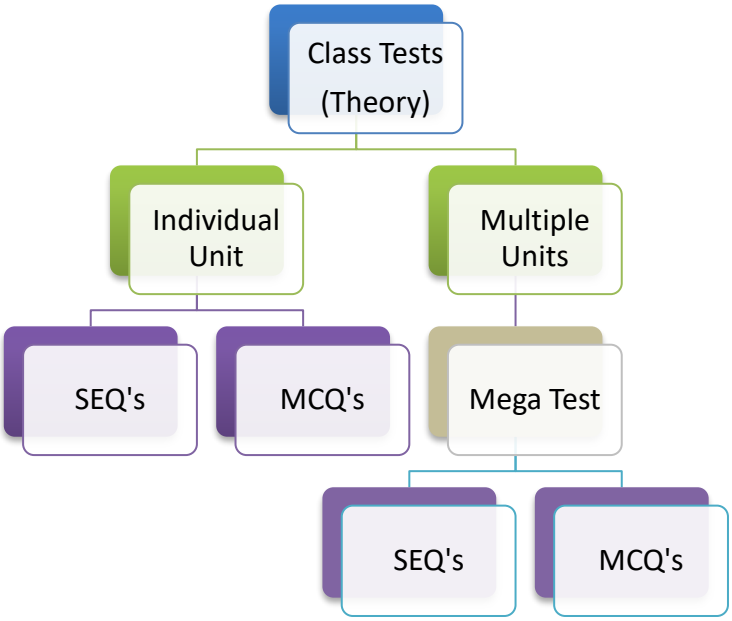
- Students are required to ensure maximum attendance in all sections including lectures and clinical classes.
- Minimum attendance to qualify for appearing in final professional examination is 75% of lectures and clinical classes. But this is not the desired level. All students should make sure that they attend the classes 100%, except some unavoidable circumstances. Because missing one lecture or clinical class means one has missed a topic, a disease or a very important aspect of the subject.
- If a student is continuously absent for 07 days or more, his /her name will be stuck off from the college, and he /she will have to get re-admission after consideration by the administration.

ASSESSMENT:

Internal assessment carries 10% Weightage in final professional examination, meaning that out of 500 marks of Medicine 50 marks are decided by the performance of student in the whole academic year. This will comprise of marks in;

- Class tests
- Mega tests
- Send up examination.

Note: Mapping of Lecture Breakup with Course Learning Outcomes and assessment methods is available at the end of the handbook.



Class Tests:

There will be class tests after completion of a system in lectures. This will be a written test comprising of Short Essay Questions (SEQs) and/or Multiple Choice Questions (MCQs). As mentioned earlier, number of lectures allocated to each system is given, and includes total lectures plus one last lecture is for a test on that system. So one week time will be available for the preparation.

Mapping of Lecture Breakup with Course Learning Outcomes and assessment methods:

Course learning outcomes

At the end of the session / section; the student will be able to

1. Diagnose a case scenario
2. Devise an investigation plan
3. Write down a comprehensive management plan
4. Describe the common complications and their management
5. Knows the follow up & rehabilitation plan of the common as well as important diseases of a particular system.

RECOMMENDED BOOKS

1. **Davidson's Principles and Practice of Medicine** by Davidson. 23rd edition.

2. **Kumar & Clark's Clinical Medicine** by Parveen J Kumar & Michaell, Clark. 9th Edition

Online Journals and Reading Materials through HEC Digital Library Facility.

RESOURCE PERSONS

1. **Professor Ayub Latif Khawaja (Head of Department of Medicine)**
2. **Professor Taj Jamshad (Professor of Medicine)**

Department of Surgery

PREFACE

Dear students this study guide is an effort from your college and department of General Surgery to facilitate you in improving your understanding and knowledge of this subject and improving your learning as well as performance. The purpose of the study guide is to help you learn the subject of General Surgery. Study guides are different from textbooks. This handbook is designed to make you familiar with the subject, learning objectives, detailed plans of lectures & clinical classes, assessments, and detailed course contents. The handbook is prepared according to the requirements of Pakistan Medical Commission and University of Heath and Science guidelines. This guide includes details about various teaching activities which will take place throughout the academic year.

At Sharif Medical and Dental college system what we follow is based on annual assessment in which we teach the subject of General Surgery in all academic years by dividing the syllabi of medical education. The training program we follow is based on the vision of UHS and mission of SMDC. This teaching and training program is friendly and easy to understand for new students. The study guide we developed is detailed and comprehensive. Students can get all the information about the lectures, timetable, ward classes, small group discussion, and paper pattern and marks distribution. List of lectures to be conducted in the session are mentioned with names of the instructors. Every lecture has some purpose and outcome to be achieved that is also included. Complete detail about the examination, surgical procedures and management is included for the students so broad and specific learning objectives are achieved to maximum level. A detail of assessment methods and schedule is also present for students so they can make their timetable for the examination. The entire course outline is given with topic to be taught and the tutors.

Check list of recommended text books are also a part of study guide. We are hopeful that the study guide will be great help for new students.

We from the department of Internal Medicine, Sharif Medical and Dental College wish and pray for your success in future.

May Allah the Greatest of All, helps you and us in achieving this. Ameen.

Department of General Surgery
Sharif Medical and Dental College,
Lahore
Email: generalsurgery@sharifmedicalcity.org

LIST OF CONTENTS

GENERAL STUDENT LEARNING OBJECTIVES

The MBBS medical students at the end of the undergraduate training program in the subject of General Surgery should be able to demonstrate the following outcomes:

- Skillful
- Knowledgeable
- Community health promoter
- Critical thinker
- Professional and role model
- Researcher
- Leader

Course Objectives: At the end of undergraduate training program in the subject of General Surgery, the graduate should possess essential knowledge, skills and attitude in order to enable them to:

- Take comprehensive history, perform detailed physical examination and make a probable diagnosis with a list of differential diagnoses.
- Devise an investigation plan, interpret the information and apply his knowledge.
- Suggest a treatment plan for patients.
- Apprehend and diagnose possible complications.
- Document all aspects properly and timely.
- Write and present the cases.
- Identify medical diseases presenting in out-patients, in-patients and emergency departments.
- Provide primary health care, at the community level.
- Perform essential medical emergency and planned procedures.
- Communicate and counsel effectively with the patient, their families and the community, regarding disease and its relevant issues.
- Understand medical ethical issues and their application in reference to General Surgery.
- Maintain the confidentiality of the patient.
- Counsel patients and families regarding common medical problems.
- Guide the patients and families regarding rehabilitation.
- Understand the prevalence and prevention of the common Public Health Problems related to General Surgery in the community.
- Understand the principles of medical research including medical writing.
- Understand the fundamentals of Information Technology and basic computer software.
- Understands the principles of sterilization and disinfection techniques to prevent infections to the patients and save himself or herself from patients.
- Be a life-long self-directed learner.
- Exhibit Professionalism.
- Competent in Preventive Medicine.

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1. Break 10:00am - 10:15am
2. Mentorship Session 10:15am - 11:00am
3. Behavioral Sciences Lecture 11:00am - 11:45am

Prof. Maria Aslam
Head Deptt. of Pathology
Chairperson Time Table Committee

Department of Surgery

Sharif Medical & Dental College, Lahore

Academic Calendar 2023

2nd Year MBBS (14th Feb. to 16th Oct. 2023)

Doctor's Name: Dr. Hassan Taqi

Lec No.	Date	Day	Time	Lectures	
				Topics	Sub-Topics
1	14-Feb.23	Tuesday	10:00-11:00	Surgery	Horner 'Syndrome
2	21-Feb. 23	Tuesday	10:00-11:00		Brown Sequard Synd.
3	28-Feb.23	Tuesday	10:00-11:00		Surgical anatomy & pathologies of Salivary glands
4	7-Mar.23	Tuesday	10:00-11:00		Surgical anatomy & pathologies of Salivary glands calculi & tumors
5	21-Mar.23	Tuesday	10:00-11:00		**CLASS TEST** (Surgical anatomy & pathologies of Salivary glands calculi & tumors (parotidectomy, Frey`s syndrome, Bell`s palsy))
6	28-Mar.23	Tuesday	10:00-11:00		Pathologies of ventricular system (Hydrocephalus)
7	11-Apr.23	Tuesday	10:00-11:00		Brainstem death & cerebral herniation
8	18.Apr.23	Tuesday	10:00-11:00		Anterior abdominal wall applied anatomy
9	25-Apr.23	Tuesday	10:00-11:00		(Surgical skin incisions)
10	02-May.23	Tuesday	10:00-11:00		Anterior abdominal wall anesthesia (Nerve block-TAP)
11	09-May.23	Tuesday	10:00-11:00		**CLASS TEST**(Pathologies of ventricular system (Hydrocephalus) , Brainstem death & cerebral herniation, Anterior abdominal wall applied anatomy (Surgical skin incisions) , Anterior abdominal wall anesthesia (Nerve block-TAP) , Anterior abdominal wall hernias/ Ventral hernias
12	16-May.23	Tuesday	10:00-11:00		Groin hernias (Inguinal)
13	23-May.23	Tuesday	10:00-11:00		Groin hernias (Femoral hernias)
14	30-May.23	Tuesday	10:00-11:00		Groin lumps (Psoas abscess)
15	6-Jun.23	Tuesday	10:00-11:00		Surgical conditions of scrotum & testis
16	13-Jun.23	Tuesday	10:00-11:00		Surgical anatomy of hepatobiliary system
17	18-Jul.23	Tuesday	10:00-11:00		Trauma
18	25-Jul-23	Tuesday	10:00-11:00		Porto systemic circulation
19	1-Aug.23	Tuesday	10:00-11:00		Surg anat hepatobiliary sys, Tra, Porto sys
20	8-Aug.23	Tuesday	10:00-11:00		Surgical infections of abdominal viscera's (appendectomy)
21	15-Aug.23	Tuesday	10:00-11:00		Surgical infections of abdominal viscera's (Cholecystectomy)
22	22-Aug.23	Tuesday	10:00-11:00	Surgery	Perianal pathologies & anatomical considerations (Anal fissure)
23	29-Aug.23	Tuesday	10:00-11:00		Perianal pathologies & anatomical considerations (perianal abscess)

24	5-Sep.23	Tuesday	10:00-11:00		Perianal pathologies & anatomical considerations (sinus & fistula)
25	12-Sep.23	Tuesday	10:00-11:00		Per-rectal and per-vaginal examination & significance
26	19.Sep.23	Tuesday	10:00-11:00		**CLASS TEST** (Perianal pathologies &anatomical considerations (Hemorrhoids, Anal fissure, perianal abscess, sinus & fistula, Per-rectal and per-vaginal examination & significance)
27	26-Sep.23	Tuesday	10:00-11:00		Head & neck trauma (Cranial hematomas & Facial fractures)
28	03-Oct.23	Tuesday	10:00-11:00		Neck incisions & surgical significance of Facial layers of neck
29	10-Oct.23	Tuesday	10:00-11:00		Common neck lumps (Goiter, Hypoglossal cyst, Cystic hygroma, Cervical rib, Cervical lymphadenoathy, Branchial fistula & cyst, SCM tumor, Laryngoscope, Pharyngeal pouch)
30	17-Oct.23	Tuesday	10:00-11:00		Surgical anatomy & pathologies of thyroid gland (thyroidectomy, laryngeal nerve injuries, techniques of airway maintenance)

COURSE OUTLINE:

TRAINING PROGRAM FOR LECTURE
DEPARTMENT OF GENERAL SURGERY
(2nd YEAR MBBS)

INCHARGE -Dr Hassan Taqi (consultant)
COORDINATOR- Dr. Imran Abbas (PGR)

Date	Day	Time	Topic	Tutor	Book
SURGERY					
February-23					
14-02-23	Tuesday	10:00am11:00am	Surgical anatomy & pathologies of Salivary glands	Dr. Hassan Taqi	Bailey & Love
21-02-23	Tuesday	10:00am11:00am	Surgical anatomy & pathologies of Salivary glands calculi & tumors	Dr. Hassan Taqi	Bailey & Love
28-02-23	Tuesday	10:00am11:00am	Parotidectomy, Frey's syndrome, Bell's palsy	Dr. Hassan Taqi	Bailey & Love
MARCH-23					
07-03-23	Tuesday	10:00am11:00am	**CLASS TEST** (Surgical anatomy & pathologies of Salivary glands calculi & tumors (parotidectomy, Frey`s syndrome, Bell`s palsy))	Dr. Hassan Taqi	Bailey & Love
14-03-23	Tuesday	10:00am11:00am	Pathologies of ventricular system (Hydrocephalus)	Dr. Hassan Taqi	Bailey & Love
21-03-23	Tuesday	10:00am11:00am	Brainstem death & cerebral herniation	Dr. Hassan Taqi	Bailey & Love
28-03-23	Tuesday	10:00am11:00am	Anterior abdominal wall applied anatomy (Surgical skin incisions)	Dr. Hassan Taqi	Bailey & Love
29-03-21	Tuesday	10:00am11:00am	Anterior abdominal wall anesthesia (Nerve	Dr. Hassan Taqi	Bailey & Love

			block-TAP)		
April -23					
1st April-8th April-2023 (Spring Vacations)					
11-04-23	Tuesday	10:00am11:00am	**CLASS TEST**(Pathologies of ventricular system (Hydrocephalus) , Brainstem death & cerebral herniation, Anterior abdominal wall applied anatomy (Surgical skin incisions) , Anterior abdominal wall anesthesia (Nerve block-TAP) , Anterior abdominal wall hernias/ Ventral hernias	Dr. Hassan Taqi	Bailey & Love
18-04-23	Tuesday	10:00am11:00am	Groin hernias (Inguinal)	Dr. Hassan Taqi	Bailey & Love
25-04-23	Tuesday	10:00am11:00am	Groin hernias (Femoral hernias)	Dr. Hassan Taqi	Bailey & Love
May-23					
02-05-23	Tuesday	10:00am11:00am	Groin lumps (Psoas abscess)	Dr. Hassan Taqi	Bailey & Love
09-05-23	Tuesday	10:00am11:00am	Surgical conditions of scrotum & testis	Dr. Hassan Taqi	Bailey & Love
16-05-23	Tuesday	10:00am11:00am	Surgical anatomy of hepatobiliary system	Dr. Hassan Taqi	Bailey & Love
23-05-23	Tuesday	10:00am11:00am	Trauma	Dr. Hassan Taqi	Bailey & Love
	Tuesday	10:00am11:00am	Porto systemic circulation	Dr. Hassan Taqi	Bailey & Love
June-23					
06-06-23	Tuesday	10:00am11:00am	portal hypertension	Dr. Hassan Taqi	Bailey & Love
13-06-23	Tuesday	10:00am11:00am	**CLASS TEST**	Dr. Hassan	Bailey &

			(Surgical anatomy of hepatobiliary system, Trauma, Porto systemic circulation, portal hypertension)	Taqi	Love
July-23					
15th June-15th July-23 (Summer Vacations)					
18-07-23	Tuesday	10:00am11:00am	Surgical infections of abdominal viscera's (appendectomy)	Dr. Hassan Taqi	Bailey & Love
25-07-23	Tuesday	10:00am11:00am	Surgical infections of abdominal viscera's (Cholecystectomy)	Dr. Hassan Taqi	Bailey & Love
Aug 2023					
01-08-2023	Tuesday	10:00am11:00am	Perianal pathologies & anatomical considerations (Anal fissure)	Dr. Hassan Taqi	Bailey & Love
08-08-2023	Tuesday	10:00am11:00am	Perianal pathologies & anatomical considerations (perianal abscess)	Dr. Hassan Taqi	Bailey & Love
15-08-2023	Tuesday	10:00am11:00am	Perianal pathologies & anatomical considerations (sinus & fistula)	Dr. Hassan Taqi	Bailey & Love
22-08-2023	Tuesday	10:00am11:00am	Per-rectal and per-vaginal examination & significance	Dr. Hassan Taqi	Bailey & Love
29-08-2023	Tuesday	10:00am11:00am	**CLASS TEST** (Perianal pathologies &anatomical considerations (Hemorrhoids, Anal fissure, perianal abscess, sinus & fistula, Per-rectal and per-vaginal examination & significance)	Dr. Hassan Taqi	Bailey & Love

Sep 2023					
05-09-23	Tuesday	10:00am11:00am	Head & neck trauma (Cranial hematomas & Facial fractures)	Dr. Hassan Taqi	Bailey & Love
12-09-23	Tuesday	10:00am11:00am	Neck incisions & surgical significance of Facial layers of neck	Dr. Hassan Taqi	Bailey & Love
19-09-23	Tuesday	10:00am11:00am	Common neck lumps (Goiter, Hypoglossal cyst, Cystic hygroma, Cervical rib, Cervical lymphadenoathy, Branchial fistula & cyst, SCM tumor, Laryngoscope, Pharyngeal pouch)	Dr. Hassan Taqi	Bailey & Love
26-09-23	Tuesday	10:00am11:00am	Surgical anatomy & pathologies of thyroid gland (thyroidectomy, laryngeal nerve injuries, techniques of airway maintenance)	Dr. Hassan Taqi	Bailey & Love
Oct 2023					
03-10-23	Tuesday	10:00am11:00am	**CLASS TEST** (Surgical anatomy of hepatobiliary system, Trauma, Porto systemic circulation, portal hypertension)	Dr. Hassan Taqi	Bailey & Love

MODES OF INFORMATION TRANSFER

LECTURES:

Lectures are planned to give the theoretical knowledge of the course contents. The main purpose of the lectures is to broadly introduce the topic or disease. The lecture schedule with the name of the tutor is mentioned below in the tabulated form. The lectures are taken at the lecture halls of main college building according to the annual devised schedule or academic calendar. Due to COVID-19 pandemic and lockdown with closure of colleges and universities, the classes were interrupted. Online classes through ZOOM meetings, Google classrooms and other online teaching modes were also started.

FEEDBACK:

The teaching faculty will give constructive feedback on the performance of the students. This will be individual in clinical classes and collective in class tests and mega tests (however students who fail to perform good in tests or those who want to know about their performance may be given individual feedback). Students should take all the feedbacks in positive spirit & attitude to find out the level of their performance, areas where they need improvements and suggestions and guidance from the teachers, how to improve the weaknesses etc. the sole purpose of feedbacks is to improve the learning of students.

ATTENDANCE:

- Students are required to ensure maximum attendance in all sections including lectures and clinical classes.
- Minimum attendance to qualify for appearing in final professional examination is 75% of lectures and clinical classes. But this is not the desired level. All students should make sure that they attend the classes 100%, except some unavoidable circumstances. Because missing one lecture or clinical class means one has missed a topic, a disease or a very important aspect of the subject.

ASSESSMENT

Student's knowledge as about the subject is assessed at various levels.

1. **Class Tests** are held after the completion of each topic in class lecture hall which includes
   (a) Multiple choice question (MCQ's)
   (b) Short Assay question (SAQ's)

STAFF CONTACTS GENERAL SURGERY DEPARTMENT

Sr. No.	NAME	EMAIL ADDRESS
1	Prof. Muhammad Mohsin Gillani	drmohsingillani@gmail.com
2	Dr. Salman Akhtar	drsalmanakhtar@yahoo.com
3	Dr Hassan Taqi	hassantaqi49@yahoo.com
4	Dr Imran Abbas	narmi251@gmail.com
5	Dr. Rida Fatima	ridafatima3969@gmail.com

RECOMMENDED BOOKS

- Bailey & Love's Short Practice of Surgery 27th Edition
- The Washington Manual of Surgery, 8th Edition
- Netter's surgical anatomy review

LEARNING RESOURCES

- Lectures
- Small group demonstrations and discussion
- Outpatient department clinical evaluation as short cases
- Videos on clinical signs and operative procedures
- Skill labs/models
- Seminars
- Study Guide

RESOURCE PERSONS

- **Prof Muhammad Mohsin Gillani (HOD General Surgery)**
- **Dr Salman Akhtar (Assistant professor General Surgery)**
- **Dr. Hassan Taqi (SR)**

Department of Obstetrics & Gynecology

PREFACE

Study guides are a major contribution to learning. They are like a tutor sitting beside the student and available 24 hours a day to guide the student what he/she should be doing at any particular stage in the study. Study guides are different from textbooks. These apprise the student at the beginning of an academic session not only about the course outline but also regarding the teaching methodology to be followed throughout the year, learning objectives of each and every academic activity and the assessment methodology that will be followed in an academic session.

The traditional annual academic schedule is followed in Sharif Medical and Dental College. In it the subject of Obstetrics and Gynecology is taught in the fourth and fifth academic year of a medical student teaching. Keeping in view the mission of University of Health Sciences, Lahore and the vision of our institute a training program has been designed which is intensive and interesting for the young minds. This guide includes details about various teaching activities and assessments which are to take place throughout these academic years along with the time allocation. Names of faculty have also been mentioned to encourage better interaction between the teacher and the students. A list of prescribed textbooks and reference books is a part of this study guide. Our intention is to improve upon it in the light of the student-feedback every year. We wish you a happy academic session.

Prof. Dr. Maimoona Hafeez,

H.O.D, Obstetrics & Gynecology

Sharif Medical & Dental College, Lahore.

Date: 18-03-2023

LIST OF CONTENTS

TRAINING PROGRAM FOR DEPARTMENT OF GYNAE & OBS

2nd YEAR MBBS CLASS

Schedule of Gynae & Obs. Lectures MBBS 2nd Year Class (Session 2023-2024)

Sr. No	Topics	Doctor's Name
1.	Uterovaginal Prolapse	Dr. Shazia Tazion
2	Ovarian Uterine Cycle abnormalities	Dr. Shazia Tazion
3	Endometriosis	Dr. Shazia Tazion
4	Infertility, Contraception	Dr. Shazia Tazion
5	Ectopic Pregnacy	Dr. Shazia Tazion
6	Stages of Normal Labour	Dr. Shazia Tazion

TEACHING HOURS:

Second Year MBBS

Lectures	1/ Week
Total Lectures	06 Lectures
Total Lectures Hours	04 Hours / Year
Total Teaching Hours	04 Hours / Year

LEARNING OBJECTIVE OF DIFFERENT TOPICS IN OBSTETRICS AND GYNAECOLOGY

SECOND YEAR MBBS CLASS

At the end of session, the students will be able to:

Serial number	Topic	Learning Objective
1	Uterovaginal Prolapse	• Understand names and anatomy of female external & internal genitalia. • Causes of Prolapse
2	Ovarian Uterine Cycle abnormalities	• Enumerate different structures and factors required in the establishment and periodic occurrence of menstrual cycles.
3	Endometriosis	• Evaluate the patho-physiology of various types of abnormal uterine bleeding and their appropriate treatment
4	Infertility, Contraception	• Define fertilization & pathophysiology of implantation which will help them in learning the basics of Obstetrics & part of Gynaecology. • Types of Infertility and their treatment • Mode of contraception
5	Ectopic Pregnancy	• To define and know different types of ectopic pregnancy and how to diagnose and manage its different presentations.
6	Stages of Normal Labour	• Understand the normal physiology of labour.

Time Table

SHARIF MEDICAL & DENTAL COLLEGE

TIME TABLE, 2ndYEAR MBBS (Session 2022 - 2023)

Notified - 25-01-2023 S.M&D.C No/151-56/Path/3397-23/2023 Dated: 22-01-2023

Day & Time	08:30am - 09:15am	09:15am - 10:00am	10:00am - 11:00am	11:00am - 11:30pm	11:30am - 12:30pm	12:30pm - 02:30pm
Monday	Biochemistry Lecture Lecture Hall 1	Physiology Lecture Lecture Hall 1	Clinical Lecture Medicine Lecture Hall 1	**Break**	Self Direct Learning Dissection Hall	Histology Practical Physiology Practical B Biochemistry Practical C Tutorial Physiology / Biochemistry (SGD) D (alternate weeks) Demonstration Room No. 1 - 1
Tuesday	Physiology Lecture Lecture Hall 1	Self Direct Learning Anatomy Lecture Hall 1	Patient Safety Lecture (31st Jan & 7th Feb) Clinical Lecture Surgery (14th Feb - End of Session) Lecture Hall 1	**Break**	Anatomy Dissection / Demonstration (SGD)	Histology Practical D Physiology Practical C Biochemistry Practical B Tutorial Physiology / Biochemistry (SGD) A (alternate weeks) Demonstration Room No. 1 - 1
Wednesday	Physiology Lecture Lecture Hall 1	Histology Lecture Lecture Hall 1	**10:00am - 10:30am** **Break**	**10:30am - 12:30pm** Histology Practical C Physiology Practical D Biochemistry Practical A Tutorial Physiology / Biochemistry (SGD) B (alternate weeks) Demonstration Room No. 1 - 1		**12:30pm - 01:30pm** Behavioral Sciences Lecture Lecture Hall 1 / **01:30pm - 02:30pm** Physiology Lecture Lecture Hall 1
Thusrday	**08:30am - 09:30am** Anatomy Lecture Lecture Hall 1	**09:30am - 10:15am** Clinical Lecture Research Methodology (2nd February - 20th April) Nephrology (27th April - 10th August) Gynae & Obs. (17th August - 21st September) Neurosurgery (28th September - End of Session) Lecture Hall 1	**10:15am - 10:45am** **Break**	**10:45am - 11:45am** Self Direct Learning Physiology Lecture Hall 1	**11:45am - 12:30pm** Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Library) Roll No. 51 - 100 (Demo Room 0 - 2)	**12:30pm - 02:30pm** Histology Practical B Physiology Practical A Biochemistry Practical D Tutorial Physiology / Biochemistry (SGD) C (alternate weeks) Demonstration Room No. 1-1
Friday	**08:30am - 09:30am** Biochemistry Lecture Lecture Hall 1	**09:30am - 10:30am** Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Demonstration Room 1 - 5) Roll No. 51 - 100 (Library)	**10:30am - 11:45am** Anatomy Dissection / Demonstration (SGD)	**11:45am - 12:30pm** Physiology Lecture Lecture Hall 2	----------	
Saturday	**08:30am - 09:15am** Islamiyat / Pak. Studies Lecture Hall 1	**09:15am - 10:00am** Biochemistry Lecture Lecture Hall 1	**10:00am - 10:30am** **Break***	**10:30am - 11:45am** Behavioral Sciences Lecture* Lecture Hall 3	**11:45am - 12:30pm** Self Direct Learning Physiology Lecture Hall 3	**12:30pm-01:30pm** Self Direct Learning Dissection Hall / **01:30pm - 02:30pm** Anatomy Dissection / Demonstration (SGD)

Copy Forwarded To:

1: Dr. Muhammad Adnan Khan Chief Executive SMC
2:Principal SMDC
3:Principal, College of Dentistry
4:Heads of all concerned Departments
5:Director Administration
6: Notice Boards

*** Amendments in Time Table ONLY for 2nd Saturday of every month.**

1. Break 10:00am - 10:15am
2. Mentorship Session 10:15am - 11:00am
3. Behavioral Sciences Lecture 11:00am - 11:45am

Prof. Maria Aslam
Head Deptt. of Pathology
Chairperson Time Table Committee

Department of Gynae & Obs.
Sharif Medical & Dental College, Lahore
Academic Calendar 2023
2nd Year MBBS (17th Aug. to 21st Sep. 2023)
Doctor's Name: Dr. Shazia Tazion

Lec. No.	Date	Day	Time	Lectures	
				Topics	Sub-Topics
1	17-Aug.23	Thursday	09:30-10:15	Gynae & Obs.	Uterovaginal Prolapse
2	24- Aug.23	Thursday	09:30-10:15		Ovarian Uterine Cycle abnormalities
3	31-Aug.23	Thursday	09:30-10:15		Endometriosis
4	07-Sep. 23	Thursday	09:30-10:15		Infertility, Contraception
5	14-Sep.23	Thursday	09:30-10:15		Ectopic Pregnacy
6	21-Sep.23	Thursday	09:30-10:15		Stages of Normal Labour

FACULTY MEMBERS

- **HOD & Prof. Dr. Maimoona Hafeez** (maimoonahafeez@gmail.com)
- **Prof. Dr. Fauzia Butt** (drfauziabutt@hotmail.com)
- **Associate Prof. Dr. Nishat Akram** (nishatakram0@gmail.com)
- **Associate Prof. Dr. Rukhsana Zafar** (rukhsanaz@hotmail.com)
- **Associate Prof. Dr. ShaziaTazion** (drtazion@yahoo.com)
- **Assistant Prof. Dr. Anees Fatima** (Fatima.tabjeel@gmail.com)
- **Assistant Prof Dr. Salma Sadia** (Ssadia116@gmail.com)
- **Senior Registrar Dr. Seemal Tajassar** (tajasarseemal@gmail.com)
- **Senior Registrar Dr. Samara Kaleem** (samarakaleem@hotmail.com)

RECOMMENDED TEXT BOOKS

1) Obstetrics & Gynaecology by Ten Teachers by Stuart Campbell and Christoph Lees, 20th
2) Obstetrics& Gynaecology by Dr. Arshad Chohan
3) Online Journals and Reading Materials through HEC Digital Library Facility.
4) Illustrated Obstetrics & Gynaecology by Hanretty 6th Ed.
5) Dew Hurst's Obstetrics & Gynaecology

Department of Behavioral Sciences

PREFACE

Study guide can make a major contribution to learning. It is sometimes likened to a tutor sitting on the student's shoulder 24 hours a day to advise what he/she should be doing at any stage during their study. Study guide is different from textbook as it apprises the student at the beginning of an academic session about the course outline, the teaching methodology to be followed throughout the year, learning objectives of each academic activity and the assessment methodology to be followed in an academic session.

At SMDC we follow the traditional annual academic schedule in which the subject of Behavioral Sciences is taught in the first three academic years of a medical student. Keeping in view the mission of UHS, Lahore and vision of our institute we have designed a training program which is intensive and at the same time interesting for the young minds. This guide includes list of lectures to be conducted in this session, specific learning objectives of every lecture, details of assessment and testing methodology, and marks distribution of subject in the 3rd Professional examination. A list of prescribed textbooks and reference books is mentioned at the end.

LIST OF CONTENTS

PLANNED TEACHING ACTIVITIES

Following teaching plan of behavioral sciences has been designed to impart core knowledge, skills and attitude in a manner that an undergraduate student can grasp the subject fully and is adequately prepared for university examinations.

Lectures:

A total of 40 lectures by the faculty members are planned for the entire year. The lectures will be interactive and active learning is encouraged. The students are required to study the topic with the help of prescribed textbooks in light of the learning objectives of the topic enunciated by the teacher at the beginning of each lecture.

TEACHING PROGRAM FOR LECTURES

SR. No.	Topic	Facilitator
1	Introduction to Behavioral sciences	Dr. Ayaz
2	Holistic vs. Traditional allopathic medicine	Dr. Ayaz
3	Bio-psycho-social model of health and disease	Dr. Ayaz
4	Integrated model of healthcare	Ms. Sarah
5	Public healthcare model	Ms. Kanwal
6	Non-Pharmacological Interventions	Dr. Mehwish
7	Communication Skills	Ms. Sarah
8	Counseling	Ms. Kanwal
9	Informational Care	Ms. Sarah
10	Breaking Bad News	Dr. Mehwish
11	Crisis Intervention and Disaster Management	Ms. Kanwal
12	Conflict Resolution	Ms. Sarah
13	Handling Difficult Patients and their Families	Ms. Kanwal
14	Empathy	Dr. Mehwish
	TEST	
15	Medical Ethics	Dr. Ayaz
16	Guiding Principles of Medical Ethics	Dr. Ayaz
17	Common Ethical Issues in Medical Practice	Dr. Mehwish
18	Common Ethical Issues in Medical Practice	Dr. Mehwish
19	Common Ethical Dilemmas	Ms. Sarah
20	Common Ethical Dilemmas	Ms. Sarah
21	Doctor-Patient Relationship	Dr. Mehwish
22	Rights and Responsibilities of Patients	Ms. Kanwal
23	Psychological Reactions in Doctor-Patient Relationship	Ms. Sarah
24	Professionalism in Healthcare	Ms. Kanwal
	TEST	
25	Psychology in Medical Practice	Ms. Sarah
26	Learning	Ms. Kanwal
27	Learning	Ms. Kanwal
28	Metacognition	Dr. Ayaz

29	Memory	Dr. Mehwish
30	Memory	Dr. Mehwish
31	Perception	Ms. Sarah
32	Thinking	Dr. Ayaz
33	Emotions	Ms. Kanwal
34	Motivation	Ms. Sarah
35	Intelligence	Dr. Ayaz
36	Personality Development	Ms. Kanwal
37	Personality Development	Ms. Kanwal
38	Personality Development	Ms. Kanwal
	TEST	
39	Sociology and Healthcare	Ms. Sarah
40	Sociology and Healthcare	Ms. Sarah
41	Child Rearing Practices	Ms. Kanwal
42	Stigma	Dr. Mehwish
43	Sick Role	Ms. Sarah
44	Compliance	Dr. Mehwish
45	Culture and Healthcare	Dr. Ayaz
46	Health Belief Model	Dr. Ayaz
	TEST	

LIST OF LECTURES AND LEARNING OBJECTIVES

Lec. No.	Lectures Topics	Learning Objectives
1	Introduction to Behavioral sciences	• Define behavioural sciences • Identify the disciplines that constitute behavioral sciences • Understand the relevance and utilization of behavioural sciences in clinical practice
2	Holistic vs. Traditional allopathic medicine	• Define holistic medicine and allopathic medicine • Enlist the advantages and disadvantages of holistic medicine and allopathic medicine
3	Bio-psycho-social model of health and disease	• Define bio-psycho-social model of health care • Comprehend the evolution and scope of the bio-psycho-social model
4	Integrated model of healthcare	• Describe integrated model of health care
5	Public healthcare model	• Describe public health care model
6	Non-Pharmacological Interventions	• Describe principles of effective communication • Conduct interview of patient and his/her relative using effective communication skills
7	Communication Skills	• Understand verbal and non-verbal communication • Enlist the Do's and Don'ts of communication, counseling etc.
8	Counseling	• Demonstrate communication skills, counselling skills and their various applications i.e. informational care, breaking bad news, conflict resolution, crisis intervention, handling difficult patients etc.
9	Informational Care	• To develop the ability to accurately diagnose medical condition, interpret results and provide appropriate knowledge and treatment to the patient
10	Breaking Bad News	• To develop effective communication skills • Empathetic patient centered care • Tailoring information • Managing emotional reactions • Providing resources and support
11	Crisis Intervention and Disaster Management	• To learn crisis assessment • To understand and implement effective emergency response procedures to mitigate harm • To develop the ability to provide psychological first aid
12	Conflict Resolution	• To comprehend the causes of conflict

		• To develop effective communication skills • To learn and apply various conflict resolution approaches • To enhance emotional self-awareness and empathy to better navigate and manage emotions in conflict
13	Handling Difficult Patients and their Families	• Identify and explain psychosocial aspects of culturally contingent phenomena e.g. child rearing practices
14	Empathy	• Understand empathy and its clinical significance • Demonstrate empathetic attitude during clinical interactions
15	Medical Ethics	• Define medical ethics • Understand the relevance and scope of medical ethics • Describe principles of medical ethics and their clinical applications • Understand evolution of contemporary bioethics, its characteristics and relevance to practice and research
16	Guiding Principles of Medical Ethics	• Understand evolution of contemporary bioethics, its characteristics and relevance to practice and research
17	Common Ethical Issues in Medical Practice	• Identify common ethical omissions in medical practice • Demonstrate confidentiality of the patients' information • Demonstrate undertaking informed consent from the patient
18	Common Ethical Dilemmas	• Identify common ethical dilemmas in a health professional's life • Demonstrate ethical behavior towards ethical dilemmas • Debate the implications of euthanasia from social, moral, legal and religious perspectives
19	Doctor-Patient Relationship	• Describe the dimensions and limits of doctor-patient relationship
20	Rights and Responsibilities of Patients	• Understand rights and responsibilities of doctors and patients • Demonstrate rights and responsibilities of doctors and patients
21	Psychological Reactions in Doctor-Patient Relationship	• Comprehend psychological reactions arising in doctor-patient relationship like transference, counter transference, resistance • Demonstrate professional behavior towards psychological reactions of patients

		• Enlist knowledge, skills and attitudes of medical professional • Demonstrate professional attitude during the clinical interactions
22	Professionalism in Healthcare	• Enlist knowledge, skills and attitudes of medical professional • Demonstrate professional attitude during the clinical interactions
23	Psychology in Medical Practice	• Identify the role of psychological factors in the etiology, precipitation and management of illness • Understand the role of psychological and social factors in diseases causing disability, handicap and stigma • Explain the medically unexplained physical symptoms
24	Learning	• Define learning • Describe different types of conditioning and their clinical applications • Comprehend learning principles and techniques for developing new healthy behaviors, shaping patients' behaviors during disease and health and gaining insight into the behaviors of patients, colleagues and other professionals
25	Metacognition	• Define Metacognition • Demonstrate use of metacognition in academic and personal life
26	Memory	• Describe memory, its types and clinical correlates • Demonstrate techniques to improve memory
27	Perception	• Comprehend principles of perception • Explain abnormalities of perception
28	Thinking	• Define thinking and its application in problem-solving
29	Emotions	• Define emotion and its types • Understand different types of emotional expression • Explain emotional intelligence • Demonstrate various methods to improve emotional intelligence
30	Motivation	• Define motivation • Explain different types of human needs
31	Intelligence	• Define intelligence • Describe IQ test and its clinical applications
32	Personality Development	• Define personality • Identify the stages of normal personality development (psychodynamic, psychosocial, cognitive) • Describe personality disorders
33	Sociology and	• Define family, social groups, social structures and roles

	Healthcare	• Describe the influence of socio-cultural factors such as gender, race, social class, family and occupations on health and disease • Identify and explain psychosocial aspects of culturally contingent phenomena e.g. child rearing practices, death and dying • Describe the role of social support and religion to support a patient • Define treatment adherence and various strategies to improve it • Explain stigma and its effect
34	Child Rearing Practices	• Identify and explain psychosocial aspects of culturally contingent phenomena e.g. child rearing practices
35	Stigma	• Demonstrate counseling of patient to address stigma related to the illness
36	Sick Role	• Demonstrate counseling of patient to overcome the sick-role
37	Compliance	• Define treatment adherence and various strategies to improve it
38	Culture and Healthcare	• Demonstrate respectful attitude for social, cultural, religious differences during the clinical interaction
39	Health Belief Model	• Define and elicit health belief model

Time Table

SHARIF MEDICAL & DENTAL COLLEGE

TIME TABLE, 2ndYEAR MBBS (Session 2022 - 2023)

Dated:- 25-01-2023 S.M&D.C No/151-56/Path/3397-23/2023 Dated: 22-01-2023

Day & Time	08:30am - 09:15am	09:15am - 10:00am	10:00am - 11:00am	11:00am - 11:30pm	11:30am - 12:30pm	12:30pm - 02:30pm
Monday	Biochemistry Lecture Lecture Hall 1	Physiology Lecture Lecture Hall 1	Clinical Lecture Medicine Lecture Hall 1	**Break**	Self Direct Learning Dissection Hall	Histology Practical B Physiology Practical C Biochemistry Practical D Tutorial Physiology / Biochemistry (SGD) (alternate weeks) Demonstration Room No. 1 - 1
Tuesday	Physiology Lecture Lecture Hall 1	Self Direct Learning Anatomy Lecture Hall 1	Patient Safety Lecture (31st Jan & 7th Feb) Clinical Lecture Surgery (14th Feb - End of Session) Lecture Hall 1	**Break**	Anatomy Dissection / Demonstration (SGD)	Histology Practical D Physiology Practical C Biochemistry Practical B Tutorial Physiology / Biochemistry (SGD) A (alternate weeks) Demonstration Room No. 1 - 1

Day & Time	08:30am - 09:30am	09:30am - 10:15am	10:00am - 10:30am	10:30am - 12:30pm		12:30pm - 01:30pm	01:30pm - 02:30pm
Wednesday	Physiology Lecture Lecture Hall 1	Histology Lecture Lecture Hall 1	**Break**	Histology Practical C Physiology Practical D Biochemistry Practical A Tutorial Physiology / Biochemistry (SGD) B (alternate weeks) Demonstration Room No. 1 - 1		Behavioral Sciences Lecture Lecture Hall 1	Physiology Lecture Lecture Hall 1

Day & Time	08:30am - 09:30am	09:30am - 10:15am	10:15am - 10:45am	10:45am - 11:45am	11:45am - 12:30pm	12:30pm - 02:30pm
Thusrday	Anatomy Lecture Lecture Hall 1	Clinical Lecture Research Methodology (2nd February - 20th April) Nephrology (27th April - 10th August) Gynae & Obs. (17th August - 21st September) Neurosurgery (28th September - End of Session) Lecture Hall 1	**Break**	Self Direct Learning Physiology Lecture Hall 1	Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Library) Roll No. 51 - 100 (Demo Room 0 - 2)	Histology Practical B Physiology Practical A Biochemistry Practical D Tutorial Physiology / Biochemistry (SGD) C (alternate weeks) Demonstration Room No. 1-1

Day & Time	08:30am - 09:30am	09:30am - 10:30am	10:30am - 11:45am	11:45am - 12:30pm
Friday	Biochemistry Lecture Lecture Hall 1	Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Demonstration Room 1 - 5) Roll No. 51 - 100 (Library)	Anatomy Dissection / Demonstration (SGD)	Physiology Lecture Lecture Hall 2

Day & Time	08:30am - 09:15am	09:15am - 10:00am	10:00am - 10:30am	10:30am - 11:45am	11:45am - 12:30pm	12:30pm-01:30pm	01:30pm - 02:30pm
Saturday	Islamiyat / Pak. Studies Lecture Hall 1	Biochemistry Lecture Lecture Hall 1	**Break***	Behavioral Sciences Lecture* Lecture Hall 3	Self Direct Learning Physiology Lecture Hall 3	Self Direct Learning Dissection Hall	Anatomy Dissection / Demonstration (SGD)

Copy Forwarded To:

1: Dr. Muhammad Adnan Khan Chief Executive SMC
2:Principal SMDC
3:Principal, College of Dentistry
4:Heads of all concerned Departments
5:Director Administration
6: Notice Boards

*** Amendments in Time Table ONLY for 2nd Saturday of every month.**

1. Break 10:00am - 10:15am
2. Mentorship Session 10:15am - 11:00am
3. Behavioral Sciences Lecture 11:00am - 11:45am

Prof. Maria Aslam
Head Deptt. of Pathology
Chairperson Time Table Committee

Department of Behavioral Sciences
Sharif Medical & Dental College, Lahore
Academic Calendar 2023
2nd Year MBBS (1st Feb. to 14th Oct. 2023)

Doctor's Name: Dr. Sarah Sirazi/ Dr. Mehwish					
Lec. No.	**Date**	**Day**	**Time**	**Lectures**	
				Topics	**Sub-Topics**
1	1-Feb.23	Wednesday	12:30-01:30	Behavioral Sciences	Introduction to behavioral sciences
2	04-Feb.23	Saturday	10:30-11:00		Holistic vs traditional allopathic medicine
3	8-Feb.23	Wednesday	12:30-01:30		Bio-psycho-social model of health and disease
4	11-Feb.23	Saturday	10:30-11:00		Integrated model of healthcare
5	15-Feb.23	Wednesday	12:30-01:30		Public health care model
6	18-Feb.23	Saturday	10:30-11:00		Non-pharmacological interventions
7	22.Feb.23	Wednesday	12:30-01:30		Communications skills
8	25-Feb.23	Saturday	10:30-11:00		Counseling
9	1-Mar.23	Wednesday	12:30-01:30		Informational care
10	4-Mar.23	Saturday	10:30-11:00		Breaking bad news
11	8-Mar.23	Wednesday	12:30-01:30		Crists intervention and diaster management
12	11-Mar.23	Saturday	10:30-11:00		Conflict resolution
13	15-Mar.23	Wednesday	12:30-01:30		handling difficult patients and their families
14	18-Mar.23	Saturday	10:30-11:00		Empathy
15	22-Mar.23	Wednesday	12:30-01:30		Test
16	25-Mar.23	Saturday	10:30-11:00		Medicine Ethics
17	29-Mar.23	Wednesday	12:30-01:30		Guiding priciples of Medical Ethics
18	12-Apr.23	Wednesday	12:30-01:30		Common Ethical Issues in Medical Practice
19	15-Apr.23	Saturday	10:30-11:00		Common Ethical Issues in Medical Practice
20	19-Apr.23	Wednesday	12:30-01:30		Common Ethical Dilamas
21	22-Apr.23	Saturday	10:30-11:00		Common Ethical Dilamas
22	26-Apr.23	Wednesday	12:30-01:30	Behavioral Sciences	Doctor Patient Relationship
23	29-Apr.23	Saturday	10:30-11:00		Rights & Responsibilities of Patients
24	3-May.23	Wednesday	12:30-01:30		Psychological Reactions in Doctor Patient Relationship
25	6-May-23	Saturday	10:30-11:00		Professionalism in Healthcare
26	10-May-23	Wednesday	12:30-01:30		Test
27	13-May.23	Saturday	10:30-11:00		Psychology in Medical Science
28	17-May.23	Wednesday	12:30-01:30		Learning
29	20-May.23	Saturday	10:30-11:00		Learning
30	24-May.23	Wednesday	12:30-01:30		Metacognition
31	27-May.23	Saturday	10:30-11:00		Memory
32	31-May.23	Wednesday	12:30-01:30		Memory
33	03-June.23	Saturday	10:30-11:00		Perception
34	7-Jun.23	Wednesday	12:30-01:30		Thinking
35	10-Jun.23	Saturday	10:30-11:00		Emotions

36	14-Jun.23	Wednesday	12:30-01:30		Movitvations
37	19-Jul.23	Wednesday	12:30-01:30		Intelligence
38	22-Jul.23	Saturday	10:30-11:00		Personality Development
39	26-Jul.23	Wednesday	12:30-01:30		Personality Development
40	29-Jul.23	Saturday	10:30-11:00		Personality Development
41	02-Aug.23	Wednesday	12:30-01:30		Test
42	5-Aug.23	Saturday	10:30-11:00		Sociology & Healthcare
43	9-Aug.23	Wednesday	12:30-01:30		Sociology & Healthcare
44	12-Aug.23	Saturday	10:30-11:00		Child Rearing Practices
45	16-Aug.23	Wednesday	12:30-01:30		Stigma
46	19-Aug.23	Saturday	10:30-11:00		Sick Role
47	23-Aug.23	Wednesday	12:30-01:30		Compliance
48	26-Aug.23	Saturday	10:30-11:00		Culture & Healthcare
49	30-Aug.23	Wednesday	12:30-01:30		Health Belief Model
50	2-Sep.23	Saturday	10:30-11:00	Behavioral Sciences	Test
51	6-Sep.23	Wednesday	12:30-01:30		Revision
52	9-Sep.23	Saturday	10:30-11:00		
53	13-Sep.23	Wednesday	12:30-01:30		
54	16-Sep.23	Saturday	10:30-11:00		
55	20-Sep.23	Wednesday	12:30-01:30		
56	23-Sep.23	Saturday	10:30-11:00		
57	27-Sep.23	Wednesday	12:30-01:30		
58	30-Sep.23	Saturday	10:30-11:00		
59	4-Oct.23	Wednesday	12:30-01:30		
60	7-Oct.23	Saturday	10:30-11:00		
61	11-Oct.23	Wednesday	12:30-01:30		
62	14-Oct.23	Saturday	10:30-11:00		

ASSESSMENT PLAN

Following modes of assessment are planned for 2nd year MBBS class in the subject to Behavioral Sciences. This plan has been designed keeping in view the university curriculum and hopefully will facilitate the students in preparing for 2nd professional examination in the subject.

Class Tests:

These will be conducted at the completion of every section. The test will comprise of MCQs and SEQs on the pattern of university examinations.

Continuous Internal Assessment:

Internal assessment will be calculated out of 20 on the basis of all these tests that will be conducted throughout the year.

STAFF CONTACTS

Name	Role	Contact
Asst. Prof. Dr. Ayaz M. Khan	Head of Department	dr.ayazmkhan@gmail.com
Mrs. Sarah Shirazi	Course Coordinator	shirazi1255@gmail.com

RECOMMENDED TEXT BOOKS & REFERENCE BOOKS

Recommended Books

- Handbook of Behavioral Sciences for Medical and Dental Students (3rdEdition) by Mowadat H.Rana
- BRS Behavioral Science (7thEdition) by Barbara Fadem

Reference Books

- Kaplan and Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry (11thEdition)byBenjamin J. Sadock, VirginiaA. Sadock, Pedro Ruiz
- Shorter Oxford Textbook of Psychiatry(7th Edition) by Paul Harrison, Philip Cowen, Tom Burns
- Atkinson and Hilgard's Introduction to Psychology (16th Edition) by Nolen Et Al, Susan Nolen-Hoeksema

Pakistan Studies

LIST OF CONTENTS

TEACHING HOURS

Second Year MBBS

Lectures	1/ Week
Total Lectures	30 Lectures
Total Lectures Hours	24 Hours / Year

Learnings Objectives of Pakistan Studies

1.Scope

To impart basic concept of ideology of Pakistan with reference to historical backdrop of Muslims' struggle for the establishment of Pakistan, importance of Pakistan's geographical and strategic position and its relations with other countries.

2.Course Objectives.

To enable the students to:

a. To develop the sense of belongingness to their motherland
b. To develop strong faith in the basic concepts of ideology of Pakistan and its historical background.
c. To aware about the historical background of Muslims' struggle in the making of Pakistan.
d. To sensitize students about the importance of Pakistan's geographical and strategic position in South Asia.
e. To aware the students with the meaning and significance of Pakistan's foreign policy.
f. To promote the knowledge of Pakistani culture and civilization.
g. To aware new generation about the current affairs and important pillars of Pakistan's political system.
h. To develop the qualities of patriot Pakistani for understanding and fulfilling their duties and responsibilities.

3. Course Outcome.

On completion of the course, the students will be able to:

a. Develop the sense of belongingness to their motherland.
b. Apply knowledge of the historical background of Muslims' struggle in the making of Pakistan.
c. Understand about the importance of Pakistan's geographical and strategic position in South Asia.
d. Know the meaning and significance of Pakistan's foreign policy.
e. Develop the qualities of patriot Pakistani for understanding and full filling their duties and responsibilities.

Course Contents

Sharif Medical & Dental College, Lahore
Academic Calendar 2023

Pak Studies 2nd Year MBBS

Doctor's Name: Miss Oniba

Lec.No.	Date	Day	Time	Lectures	
				Topics	Sub-Topics
1	04-Feb.23	Saturday	08:30-09:15	Pak Studies	Introduction & early South Asian History
2	11-Feb.23	Saturday	08:30-09:15		Ideology, Aim & Objective for Establishment of Pakistan
3	18-Feb.23	Saturday	08:30-09:15		Muslim Reformer Hazrat Mujaddad Alf Sani
4	25-Feb.23	Saturday	08:30-09:15		Hazrat Shah Wali Ullah
5	04-Mar.23	Saturday	08:30-09:15		Syed Ahmed Barailvi, Sir Syed Ahmed Khan
6	11-Mar.23	Saturday	08:30-09:15		Educational Mov. Ali Garh & Darul Aloom Deoband
7	18-Mar.23	Saturday	08:30-09:15		Nadratul Ulema, Anjamane Hamiat e Islam
8	25-Mar.23	Saturday	08:30-09:15		Muslim Political Struggle, legislative Act1816, Act1892
9	15-Apr.23	Saturday	08:30-09:15		Partition of Bengal, Simla Deputation
10	29-Apr.23	Saturday	08:30-09:15		Formation of All India Muslim League, Minto Morley Reforms
11	06-May.23	Saturday	08:30-09:15		Lucknow Pact 1916, Montage Chelmsford Reforms
12	13-May-23	Saturday	08:30-09:15		Khilafat Movement
13	20-May.23	Saturday	08:30-09:15		Delhi Muslim Proposal, Nehru Report, 14 Points Q.A
14	27-May.23	Saturday	08:30-09:15		Two Nation Theory, Simon Commission
15	03-Jun.23	Saturday	08:30-09:15		Allama Iqbal Address at Allahabad, Round table Confer.
16	10-Jun.23	Saturday	08:30-09:15		Communal Award, Govt India Act, Congress Rule
17	22-Jul.23	Saturday	08:30-09:15		Ch. Rehmat Ali & Pakistan Movement, Lahore Res. 1940
18	05-Aug.23	Saturday	08:30-09:15		1945 Election, Cabinet Mission Plan 1946
19	12-Aug.23	Saturday	08:30-09:15		Partition Plan 1947, Radcliffe Award
20	19-Aug.23	Saturday	08:30-09:15		Establishment of Pakistan, Initial Difficulties
21	26.Aug.23	Saturday	08:30-09:15		Constitution Making
22	02-Sep.23	Saturday	08:30-09:15		Constitution of 1956 & 1962
23	09-Sep.23	Saturday	08:30-09:15		The Constitution of 1973
24	16-Sep.23	Saturday	08:30-09:15		The Islamic Provisions of Successive Constitutions
25	23-Sep.23	Saturday	08:30-09:15		The Land of Pakistan, Geography
26	30-Sep.23	Saturday	08:30-09:15		Natural Resources of Pakistan
27	07-Oct.23	Saturday	08:30-09:15		Foreign Policy of Pakistan & World Power
28	14-Oct.23	Saturday	08:30-09:15		Pakistan and Muslim World, OIC
29	21-Oct.23	Saturday	08:30-09:15		Pakistan culture & society, Language ^ Literature
30	28-Oct.23	Saturday	08:30-09:15		Human Resources in Pakistan, development & Education

Time Table

SHARIF MEDICAL & DENTAL COLLEGE

TIME TABLE, 2ndYEAR MBBS (Session 2022 - 2023)

Dated: 25-01-2023 S.M&D.C No/SMDC/Path/3397-23/2023 Dated: 22-01-2023

Day & Time	08:30am - 09:15am	09:15am - 10:00am	10:00am - 11:00am	11:00am - 11:30pm	11:30am - 12:30pm	12:30pm - 02:30pm
Monday	Biochemistry Lecture Lecture Hall 1	Physiology Lecture Lecture Hall 1	Clinical Lecture Medicine Lecture Hall 1	**Break**	Self Direct Learning Dissection Hall	Histology Practical Physiology Practical B Biochemistry Practical C Tutorial Physiology / Biochemistry (SGD) D (alternate weeks) Demonstration Room No. 1 - 1
Tuesday	Physiology Lecture Lecture Hall 1	Self Direct Learning Anatomy Lecture Hall 1	Patient Safety Lecture (31st Jan & 7th Feb) Clinical Lecture Surgery (14th Feb - End of Session) Lecture Hall 1	**Break**	Anatomy Dissection / Demonstration (SGD)	Histology Practical D Physiology Practical C Biochemistry Practical B Tutorial Physiology / Biochemistry (SGD) A (alternate weeks) Demonstration Room No. 1 - 1
Wednesday	Physiology Lecture Lecture Hall 1	Histology Lecture Lecture Hall 1	**10:00am - 10:30am** **Break**	**10:30am - 12:30pm** Histology Practical C Physiology Practical D Biochemistry Practical A Tutorial Physiology / Biochemistry (SGD) B (alternate weeks) Demonstration Room No. 1 - 1		**12:30pm - 01:30pm** Behavioral Sciences Lecture Lecture Hall 1
						01:30pm - 02:30pm Physiology Lecture Lecture Hall 1
Thusrday	**08:30am - 09:30am** Anatomy Lecture Lecture Hall 1	**09:30am - 10:15am** Clinical Lecture Research Methodology (2nd February - 20th April) Nephrology (27th April - 10th August) Gynae & Obs. (17th August - 21st September) Neurosurgery (28th September - End of Session) Lecture Hall 1		**10:15am - 10:45am** **Break**	**10:45am - 11:45am** Self Direct Learning Physiology Lecture Hall 1	**11:45am - 12:30pm** Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Library) Roll No. 51 - 100 (Demo Room 0 - 2)
						12:30pm - 02:30pm Histology Practical B Physiology Practical A Biochemistry Practical D Tutorial Physiology / Biochemistry (SGD) C (alternate weeks) Demonstration Room No. 1-1
Friday	**08:30am - 09:30am** Biochemistry Lecture Lecture Hall 1	**09:30am - 10:30am** Self Direct Learning / Peer Assisted Learning Biochemistry Roll No. 1 - 50 (Demonstration Room 1 - 5) Roll No. 51 - 100 (Library)		**10:30am - 11:45am** Anatomy Dissection / Demonstration (SGD)	**11:45am - 12:30pm** Physiology Lecture Lecture Hall 2	----------
Saturday	**08:30am - 09:15am** Islamiyat / Pak. Studies Lecture Hall 1	**09:15am - 10:00am** Biochemistry Lecture Lecture Hall 1	**10:00am - 10:30am** **Break***	**10:30am - 11:45am** Behavioral Sciences Lecture* Lecture Hall 3	**11:45am - 12:30pm** Self Direct Learning Physiology Lecture Hall 3	**12:30pm-01:30pm** Self Direct Learning Dissection Hall
						01:30pm - 02:30pm Anatomy Dissection / Demonstration (SGD)

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*** Amendments in Time Table ONLY for 2nd Saturday of every month.**

1. Break 10:00am - 10:15am
2. Mentorship Session 10:15am - 11:00am
3. Behavioral Sciences Lecture 11:00am - 11:45am

Prof. Maria Aslam
Head Deptt. of Pathology
Chairperson Time Table Committee

STAFF CONTACTS PAK STUDIES DEPARTMENT

Sr. No.	NAME	EMAIL ADDRESS
1	Miss Oniba Siddiqui	onibasiddique@gmail.com

Reference/ Text Books

Essential Readings:

"Pakistan Studies" by Ikram Rabbani, Carvan Book House, Lahore.

"Pakistan Studies" by Dr Zafar, Aziz Book Depot, Lahore.

"Mutala e Pakistan (Lazmi), Allama Iqbal Open University, Umar Printing Press, Lahore.

"Essential Book of Pakistan Studies" by Dr Rashid Ahmad Khan

Oxford Atlas of Pakistan".