BAQAI MEDICAL UNIVERSITY
BAQAI MEDICAL COLLEGE
SECOND PROFESSIONAL M.B.B.S.
NEUROSCIENCE MODULAR GUIDE- 2024

BAQAI MEDICAL COLLEGE

SECOND PROFESSIONAL M.B.B.S

STUDY GUIDE - 2024

NEUROSCIENCE MODULE

10 weeks

51-Deh Tor, Gadap Road, Super Highway. P.O Box: 2407, Karachi-75340, Pakistan.
Phone (092-21)34410-293 to 298, 34410-427 to 430.
Fax: (092-21)34410-317, 34410-43. Email: info@baqai.edu.pk, Web: www.baqai.edu.pk/

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BAQAI MEDICAL UNIVERSITY VISION STATEMENT

To evolve as a nucleus for higher learning with a resolution to be socially accountable, focused on producing accomplished health care professionals for services in all spheres of life at the national and global level.

BAQAI MEDICAL UNIVERSITY MISSION STATEMENT

University is dedicated to the growth of competencies in its potential graduates through dissemination of knowledge for patient care, innovation in scholarship, origination of leadership skills, and use of technological advancements and providing.

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BAQAI MEDICAL COLLEGE MISSION STATEMENT

The mission of the Baqai medical college is to produce medical graduates, who are accomplished and responsible individuals and have skills for problem solving, clinical judgment, research & leadership for medical practice at the international level and are also aware of the health problems of the less privileged rural and urban population of Pakistan.

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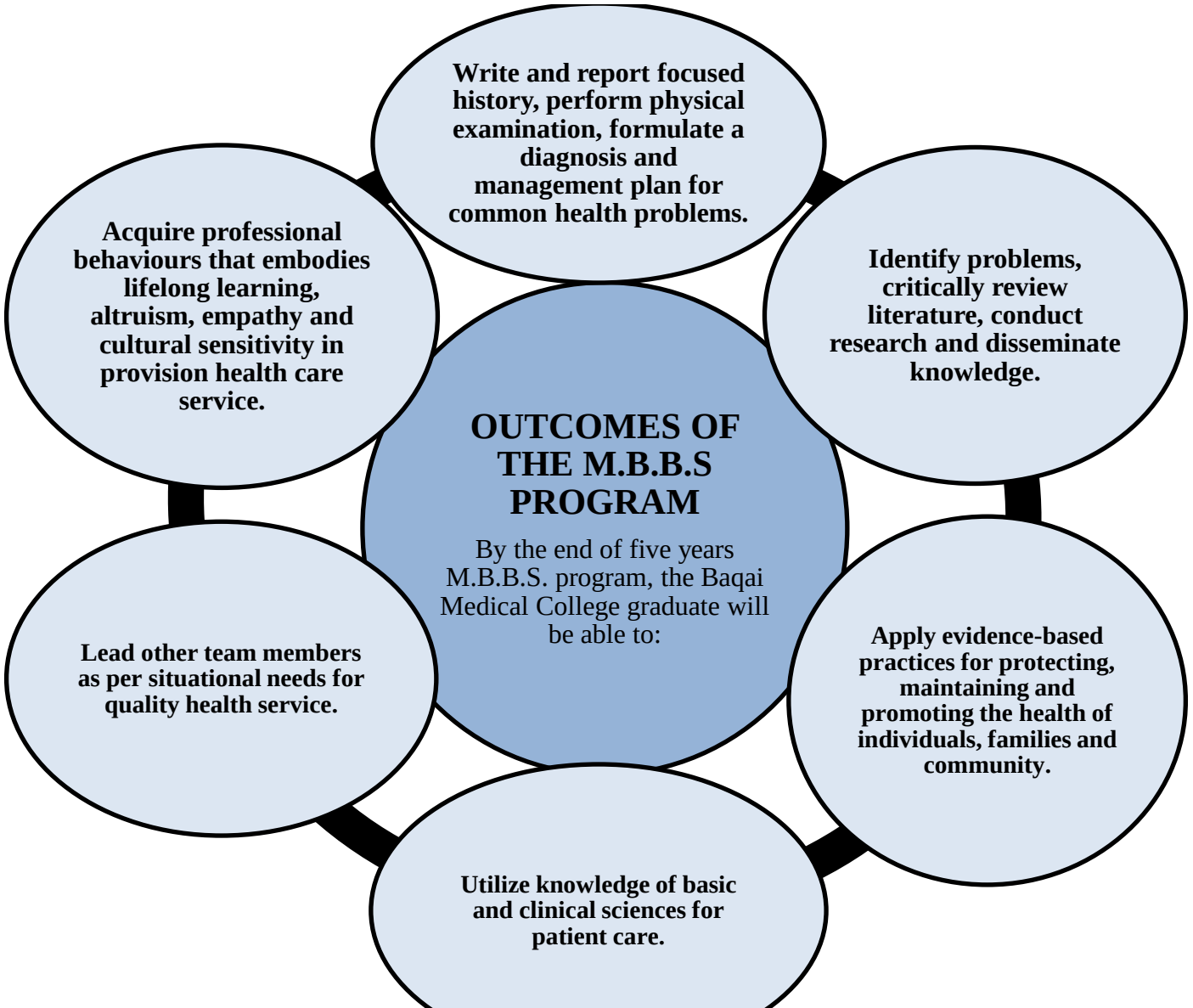

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CIC SPIRAL-1 2nd Year MBBS MODULAR TIME TABLE, STUDY GUIDE and CBL TEAM

NAME OF FACULTY	DEPARTMENT	DESIGNATION IN TEAM	EMAIL ADDRESS
Prof. Dr. Syed Inayat Ali	Anatomy	Head of CIC Spiral-1	drinayatali@baqai.edu.pk
Prof. Dr. Uzma	Anatomy	Class In-charge 2nd Year MBBS	
Dr. Benish Zafar	Biochemistry	Coordinator of 2nd Year MBBS Study Guide & Time Table Team	benishzafar@baqai.edu.pk
Dr. Mubashara Tahseen	Anatomy	Member	mubasharatahseen@baqai.edu.pk
Dr. Sobia	Physiology	Member	sobianabeel@baqai.edu.pk
Dr. Hina Masood	Pharmacology	Member	hinamasood@baqai.edu.pk
Dr. Rozeena	Pathology	Member	
Dr. Rafey Siddiqui	Forensic Medicine	Member	rafaya@baqai.edu.pk
Dr. Ammara	Community Medicine	Member	ammarasaeed@baqai.edu.pk
Dr. Aneeta / Dr. Saima Askari	Medicine	Members	haroonharoon@baqai.edu.pk / saimaaskari@baqai.edu.pk
Dr. Danish / Dr.Abdullah	Surgery	Member	drdanishmuneeb@baqai.edu.pk / dr.abdullah@baqai.edu.pk
Dr. Nikhat Ashraf	Gynaecology & Obstetrics	Member	dr.nikhatahsan@baqai.edu
Dr. Maria Rahim	Research	Member	maria.rahim@baqai.edu.pk
Dr. Mariam Ibrahim	Department of Medical Education	Member	mariamibrahim@baqai.edu.pk
Dr. Azra Shaheen	Behavioural Sciences	Member	azra@baqai.edu.pk
Dr. Danish/ Dr. Abdullah	Orthopeadics	Members	drdanishmuneeb@baqai.edu.pk / drabdullah@baqai.edu.pk

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Dr. Mehwish	Radiology	Member	
Dr. Kahkashan Perveen	Biochemistry	Spiral-1 CBL Coordinator	dr.kahkashan@baqai.edu.pk
Dr. Shahid Pervez	Anatomy	CBL team member	sshaikh@baqai.edu.pk
Dr. Salimullah	Physiology	CBL team member	drsaleemullah@baqai.edu

INTRODUCTION TO NEUROSCIENCE MODULE GUIDE:

Year to be taught: **Second Year M.B.B.S.-2024**

Placement of H&N Module: **FIFTH**

Duration: **10 weeks**

Tentative Date: 24-09-2024 to 2-12-2024

Module Assessment Date: **End of module**

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The Neuroscience Module is the fifth module for 2nd Year MBBS Integrated Modular Curriculum for MBBS program. It will give an introduction and awareness about the curriculum of neuroscience in general along with the teaching and learning environment. This module includes basic anatomical, physiological and biochemical concepts in relation to nervous system and its link with clinical aspects related to the diseases of nervous system. It also includes the basis of research and orientation about the clinical sciences. The curriculum will be delivered in the form of interactive large and small group formats including lectures, practical, CBL and SDL.

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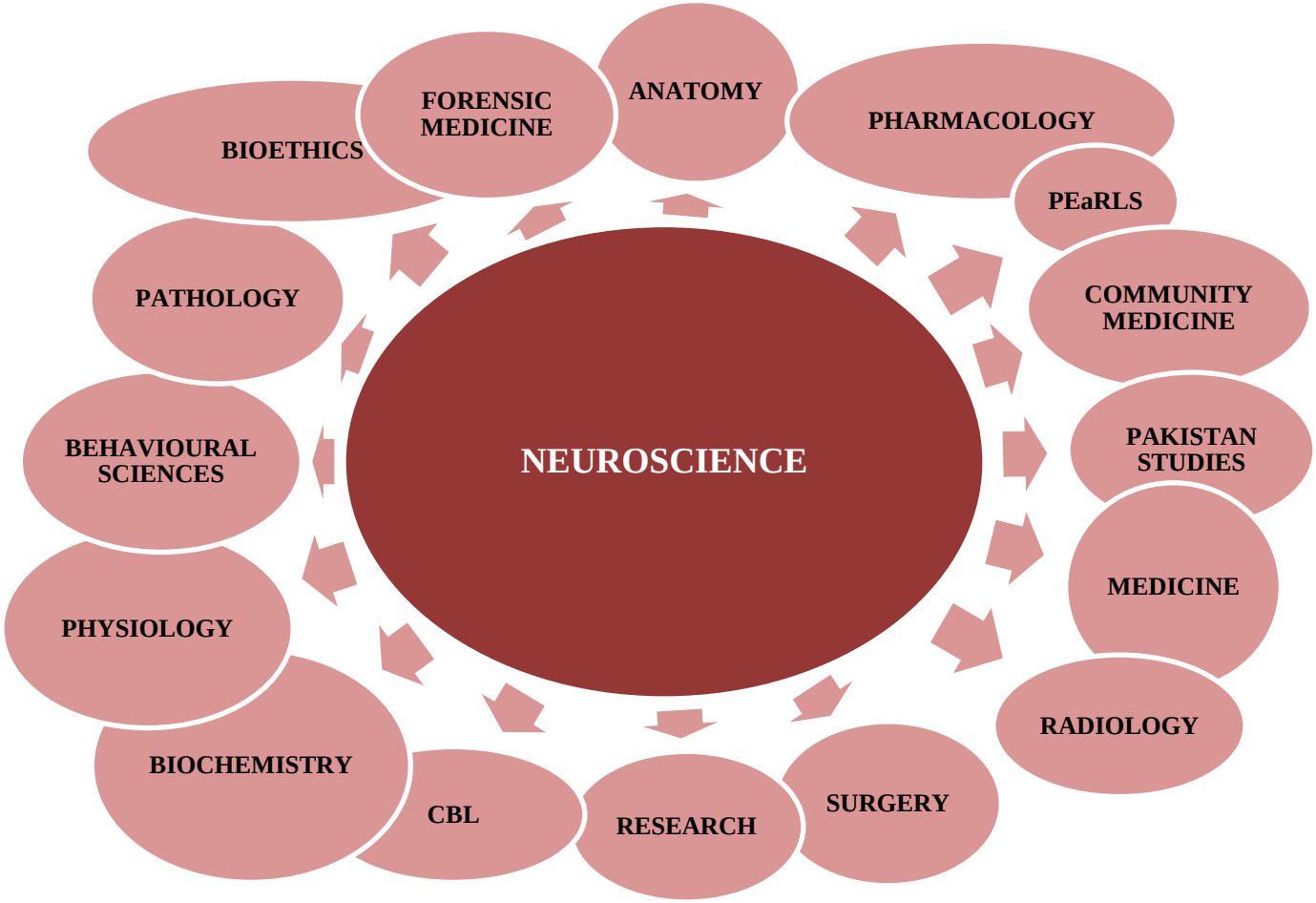

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NEUROSCIENCES MODULE OUTCOMES

At the completion of the neuroscience module, 2nd year MBBS students will be able to:

1. Discuss the development of nervous system with the congenital malformation related to it.
2. Associate the clinical presentation of CNS and PNS disorders correlating with the structure and function of the different parts of nervous system.
3. Understand the biochemical mechanism of maintenance of energy fuels for the proper functioning of brain in various body metabolic states.
4. Identify and explain the parts of fore brain, midbrain, and hind brain and associated cranial nerves lesions.
5. Understand the structure of meninges and ventricular system of brain with circulation of CSF and correlate with applied aspect.
6. Integrate the blood supply of brain and spinal cord with associated clinical conditions.

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INTEGRATED TEACHING

TOPICS WITH OBJECTIVES	DEPARTMENT	DURATION	FACILITATOR	TEACHING STRATEGY	VENUE
OVERVIEW OF NERVOUS SYSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the structure and function of major division and components of central, peripheral and autonomic nervous system.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
NEUROBIOLOGY OF NEURON & NEUROGLIAL CELLS **At the end of this lecture 2nd year MBBS students will be able to:** • Classify the types of neuron and identify them in the different parts of the nervous system. • Name the processes of neurons. • Explain the structure of synapses.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Identify the types of neuroglial cells present in the different parts of the nervous system.					
THE NEURONAL CIRCUITS AND POOL **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the structure of neuronal circuits. • Name the pools present in the CNS & the PNS. • List the types of neuronal circuits. • Summarize the role of each type of circuits.	**Physiology**	60 minutes	Dr. Saba Leeza	Lecture	Lecture hall – 2, Ground floor, Block-A.
MOBILIZATION AND TRANSPORT OF FATTY ACIDS **At the end of this lecture 2nd year MBBS students will be able to:** • Recall the chemistry of Fatty acids. • Describe the process of lipolysis. • Identify the fate of fatty acids and glycerol after lipolysis.	**Biochemistry**	45 minutes	Dr. Benish	Lecture	Lecture hall – 2, Ground floor, Block-A.

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SYNAPSES AND TYPES **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the structure of synapses. • Classify the types of synapse. • Name the electrical potential present at the synapse. • Describe the excitatory postsynaptic potentials & inhibitory postsynaptic potentials. • Explain the features of axonal and synaptic communication in neurons.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
HISTOLOGY OF NEURON AND NEUROGLIA **At the end of this lecture 2nd year MBBS students will be able to:** • Explain the histology of neuron and neuroglia. • Microanatomy of various types neuroglia cells.	**Anatomy**	45 minutes	Dr. Inayat	Lecture	Lecture hall – 2, Ground floor, Block-A.
NERVE FIBRES, RECEPTORS AND DERMATOME **At the end of this lecture 2nd year MBBS students will be able to:**	**Anatomy**	60 minutes	Dr. Mubashra	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Define the nerve fibers and name its processes. • Describe the varieties of receptors and identify them in the different parts of the body. • Explain the structure of receptors. • Recognize the dermatome of the nervous system and understand their landmarks. • Describe the transport of materials from the cell body to the axon terminals.					
RECEPTOR I, TYPES AND PROPERTIES **At the end of this lecture 2nd year MBBS students will be able to:** • Define sensory receptor. • Tabulate the different types of sensory receptors with their stimuli. • Categorize the tactile receptor.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
RECEPTOR II, TYPES AND PROPERTIES **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the basic properties of receptors. • Discuss the signal transmission through various receptors. • Explain the mechanism of stimulation of each type of receptor.	**Physiology**	60 minutes	Dr. Saba Leeza	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Explain receptor potential.					
MENINGES OF BRAIN-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the structure and function of the three meninges. • Describe the venous sinuses within the skull.	**Anatomy**	45 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.
MENINGES OF BRAIN-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Explain the contribution of meninges to the walls of the skull. • Discuss the relationship of the meninges to the different form of cerebral hemorrhage.	**Anatomy**	45 minutes	Dr. Mubashra	Lecture	Lecture hall – 2, Ground floor, Block-A.

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SPINAL CORD I **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the basic structure of the spinal cord. • Describe the structure of typical spinal nerve. • Explain the position of the main nervous pathways and nerve cell group in the spinal cord.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
SPINAL CORD II **At the end of this lecture 2nd year MBBS students will be able to:** • Comparison of structural details in different regions of the spinal cord. • Discuss the transverse section of spinal cord at different levels. • List the main arteries and veins supplying the spinal cord.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
HISTOLOGY OF SPINAL CORD **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the basic micro structure of the spinal cord.	**Anatomy**	45 minutes	Dr. Inayat	Lecture	Lecture hall – 2, Ground floor, Block-A.

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SPINAL CORD **At the end of this practical 2nd year MBBS students will be able to:** • Identify the slide and adjust under microscope • Visualize the slide by both eyes in binocular lens. • Analyze the slide by low and high magnification. • Identify the microscopic features of Spinal cord. • Discuss the spinal cord at different levels. • Comparison of structural details in different regions of the spinal cord.	**Anatomy**	120 minutes	Dr. Hina	Practical	Histology laboratory, First floor, Block-A
DEVELOPMENT OF SPINAL CORD **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the Neuro- epithelial, Mantle, and Marginal Layers. • Describe the Basal, Alar, Roof, and Floor Plates. • Enumerate the Histological Differentiation	**Anatomy**	60 minutes	Dr. Uzma	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Explain the role of neural crest cells. • Describe the processes of myelination. • Describe the clinical correlation of spinal cord development.					
NEURAL TUBE DEFECTS **At the end of this lecture 2nd year MBBS students will be able to:** • Identify the spectrum of conditions associated with failed closure of posterior neuropore. • Discuss the entities in posterior fossa malformation. • Describe craniosynostosis, clinical features and its types.	**Surgery**	45 minutes	Dr. Bashir Soomro	Lecture	Lecture hall – 2, Ground floor, Block-A.
SPINAL CORD PHYSIOLOGY **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the functions of spinal cord. • Name the sensory and motor tracts. • Describe the functional arrangement of spinal cord. • Categorize the spinal and cranial nerves. • Discuss the importance of crossed tracts.	**Physiology**	60 minutes	Dr. Sobia	Lecture	Lecture hall – 2, Ground floor, Block-A.

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PATHOLOGY OF MENINGES **At the end of this lecture 2nd year MBBS students will be able to:** • Define Meningitis. • Explain the etiopathogenesis of Meningitis. • Describe the clinical manifestations of Meningitis. • Describe the differences between meningism and meningitis. • List the laboratory findings of Meningitis.	**Pathology**	60 minutes	Dr. Sidra Izhar	Lecture	Lecture hall – 2, Ground floor, Block-A.
MENINGITIS **At the end of this lecture 2nd year MBBS students will be able to:** • Define meningitis and encephalitis • List and classify the common Central Nervous System infections	**Medicine**	45 minutes	Dr. Sumayya	Lecture	Lecture hall – 2, Ground floor, Block-A.
INTRACRANIAL INFECTIONS: **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss clinical features of meningitis • Describe the principles of central nervous system antibiotic therapy • List the common causes and causative organisms of brain abscess and empyema	**Surgery**	60 minutes	Dr. Sidrah	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Classify the type of tuberculous meningitis along with their features.					
CEREBRAL CONTUSION-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Define Cerebral Contusion • Define Epidural Hematoma • Describe the etiopathogenesis & clinical manifestations of epidural hematoma.	**Pathology**	45 minutes	Dr. Nasima Iqbal	Lecture	Lecture hall – 2, Ground floor, Block-A.
CEREBRAL CONTUSION-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Define Subdural Hematoma. • Describe the etiopathogenesis & clinical manifestations of subdural hematoma.	**Pathology**	45 minutes	Dr. Sidra Izhar	Lecture	Lecture hall – 2, Ground floor, Block-A.
BIOCSYNTHESIS OF FATTY ACIDS-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the importance acetyl CoA as the starting material for fatty acid synthesis • Identify that NADPH is required for the reduction in Fatty acid synthesis	**Biochemistry**	60 minutes	Dr. Benish	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Enumerate the phases of denovo fatty synthesis. • Explain the structure of Fatty acid synthase enzyme.					
BIOSYNTHESIS OF FATTY ACIDS-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the reactions of the 3 phases of denovo fatty acid synthesis. • Discuss the regulation of fatty acid synthesis.	**Biochemistry**	60 minutes	Dr. Benish	Lecture	Lecture hall – 2, Ground floor, Block-A.
FATTY ACID MODIFICATION & TRIGLYCERIDE SYNTHESIS **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the modifications of elongation and unsaturation which occur after FA synthesis. • Identify the differences between mitochondrial fatty acid elongation and microsomal fatty acid elongation. • Describe the synthesis of triglycerides. • List the fate of triglycerides.	**Biochemistry**	60 minutes	Dr. Benish	Lecture	Lecture hall – 2, Ground floor, Block-A.
ASCENDING TRACTS OF SPINAL CORD **At the end of this lecture 2nd year MBBS**	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2,

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students will be able to: • List the names of ascending tracts. • Drawing of each of the ascending tracts, showing their cells of origin, their course through the central nervous system and their destinations.					Ground floor, Block-A.
DESCENDING TRACTS OF SPINAL CORD **At the end of this lecture 2nd year MBBS students will be able to:** • List the names of descending tracts. • Demonstrate each of the descending tracts, showing their cells of origin, their course through the central nervous system and their destinations.	**Anatomy**	45 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.
EXCITATORY POST-SYNAPTIC POTENTIAL **At the end of this lecture 2nd year MBBS students will be able to:** • Define EPSP. • Describe the characteristics of excitatory synapses on the post synaptic membrane. • Describe the features of EPSP.	**Physiology**	60 minutes	Dr. Saba Leeza	Lecture	Lecture hall – 2, Ground floor, Block-A.

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INHIBITORY POST-SYNAPTIC POTENTIAL **At the end of this lecture 2nd year MBBS students will be able to:** • Define IPSP. • Describe the characteristics of IPSP. • Discuss the effects of inhibitory synapses on the postsynaptic membrane.	**Physiology**	60 minutes	Dr. Sobia	Lecture	Lecture hall – 2, Ground floor, Block-A.
SUMMATION & OTHER PROPERTIES **At the end of this lecture 2nd year MBBS students will be able to:** • Define summation. • Describe spatial summation and temporal summation.	**Physiology**	45 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
TRANSMISSION OF TOUCH **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the types of touch receptors. • List the types of mechanoreceptors. • Explain the functions of mechanoreceptors. • Discuss the spinal reflex arc.	**Physiology**	60 minutes	Dr. M.Ali	Lecture	Lecture hall – 2, Ground floor, Block-A.

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TRIPLE RESPONSE OF SKIN **At the end of this practical 2nd year MBBS students will be able to:** • Explain the mechanism of the three stages of triple response. • Define Axon reflex. • Describe the types of sensory fibers and neurotransmitters involved in triple response. • Discuss orthodromic and antidromic nerve conduction.	**Physiology**	120 minutes	Dr. Sobia	Practical	Physiology laboratory, First floor, Block-A
CLINICAL PRESENTATION OF NEUROLOGICAL DISEASE **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize sign and symptoms that may signify neurologic diseases.	**Medicine**	60 minutes	Dr. Anita	Lecture	Lecture hall – 2, Ground floor, Block-A.
SENSORY PATHWAYS-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the dorsal column medial lemniscus system function. • Discuss lateral pathway and its function.	**Physiology**	45 minutes	Dr. Saba Leeza	Lecture	Lecture hall – 2, Ground floor, Block-A.

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SENSORY PATHWAYS-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the pathway and functions of spinothalamic tract • Describe the pathway of fine touch.	**Physiology**	45 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
SENSE OF TEMPERATURE **At the end of this lecture 2nd year MBBS students will be able to:** • Define the sense of temperature. • Discuss the pathway of temperature regulation • Discuss the clinical manifestations showing disturbed senses of temperature.	**Physiology**	60 minutes	Dr. Sobia Khan	Lecture	Lecture hall – 2, Ground floor, Block-A.
EXAMINATION OF SENSORY SYSTEM **At the end of this practical 2nd year MBBS students will be able to:** • List the types of senses. • Describe & discuss the somatic senses with demonstration. • Explain the fine & crude senses with their tracts & demonstrate. • Define two point discrimination, stereognosis, morphosynthesis, and graphaesthesia barognosis with practical demonstration.	**Physiology**	120 minutes	Dr. Sobia Nabeel	Practical	Physiology laboratory, First floor, Block-A

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PAIN TRANSMISSION **At the end of this lecture 2nd year MBBS students will be able to:** • Define pain and pain perception. • List the different classes of pain. • Differentiate between nociceptive and non-nociceptive pain.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
GATING SYSTEM OF PAIN **At the end of this lecture 2nd year MBBS students will be able to:** • Describe Analgesia system. • Explain gate control theory of pain. • List the neurotransmitters responsible for pain suppression.	**Physiology**	60 minutes	Dr. Saba Leeza Dr. Sobia Khan Dr. Saba Abrar	Small Group Teaching	Lecture hall – 2, Ground floor, Block-A.
REFERRED PAIN **At the end of this lecture 2nd year MBBS students will be able to:** • Define referred pain. • Explain referred pain. • Discuss the types. • Discuss the theories of pain.	**Physiology**	60 minutes	Dr. Saleem	Lecture	Lecture hall – 2, Ground floor, Block-A.

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PAIN ABNORMALITIES **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss how to differentiate between pain threshold, perceptual dominance and pain tolerance. • Describe the effects of neuromodulator on the transmission of pain impulses. • Discuss headache and Trigeminal neuralgia • Discuss the effect of pain from tooth and nose referred as headache.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
SOMNIFEROUS POISONS-1(OPIOIDS) **At the end of this lecture 2nd year MBBS students will be able to:** • List the Uses of Opioids. • Describe the Extraction of Opioids from Poppy Plant. • Identify the Active Principles contained in them.	**Forensic Medicine**	45 minutes	Dr. Jan e Alam	Lecture	Lecture hall – 2, Ground floor, Block-A.
INVESTIGATION OF NEUROLOGICAL DISORDER **At the end of this lecture 2nd year MBBS students will be able to:** • List various neuro-imaging techniques CT scan /MRI	**Medicine**	60 minutes	Dr. Sumayya	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Enumerate uses of various neurophysiological investigations [Electromyelogram (EMG), Nerve conduction velocity (NCV). Electroencephalogram (EEG).					
INTRODUCTION TO MOTOR SYSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the organization of motor areas in Brain. • Explain the motor pathway • Discuss the functions of pyloric tract. • List the extra pyloric tract. • Discuss the functions and arrangement of the alpha and gamma motor neurons in the anterior grey matter of spinal cord. • Define a motor unit and its role in controlling the force developing in a skeletal muscle.	**Physiology**	60 minutes	Dr. Sobia Khan	Lecture	Lecture hall – 2, Ground floor, Block-A.
KETOGENESIS **At the end of this lecture 2nd year MBBS students will be able to:** • Define ketone bodies • List the ketone bodies • Describe the pathway of ketogenesis and its regulation.	**Biochemistry**	60 minutes	Dr. Iffat Ara Aziz	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Identify the causes of ketone bodies formation and site of production of ketone bodies.					
MOTOR SYSTEM PATHWAY-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Define descending tracts. • List the types of descending tracts. • Explain the physiologic arrangement of descending tract.	**Physiology**	45 minutes	Dr. Qamar Aziz	Lecture	Lecture hall – 2, Ground floor, Block-A.
MOTOR SYSTEM PATHWAY-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the origin, termination & functions of descending tracts. • Explain functions of motor cortex, premotor cortex and supplementary motor cortex.	**Physiology**	60 minutes	Dr. Saleem	Lecture	Lecture hall – 2, Ground floor, Block-A.
DEVELOPMENT OF BRAIN **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the development of fore brain. • Describe the defects of fore brain. • Describe the development of Mesencephalon: Midbrain.	**Anatomy**	60 minutes	Dr. Uzma	Lecture	Lecture hall – 1, Ground floor, Block-A

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• Describe the defects of midbrain. • Describe the development of Rhombencephalon: Hindbrain. • Describe the defects of hind brain.					
BRAIN TUMORS: **At the end of this lecture 2nd year MBBS students will be able to:** • Classify brain tumors based on WHO classification. • Discuss the chromosomal abnormalities associated with brain tumors. • Describe the clinical presentation in common brain tumors.	**Surgery**	60 minutes	Dr. Danish	Lecture	Lecture hall – 2, Ground floor, Block-A.
REFLEX AND ITS TYPES-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Define reflex. • List the components of a reflex arc. • Define autonomic reflexes and list them. • Classify reflexes according to the type of synapses (mono, die, and poly).	**Physiology**	45 minutes	Dr. Qamar Aziz	Lecture	Lecture hall – 2, Ground floor, Block-A.
REFLEX AND ITS TYPES-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Explain reciprocal inhibition.	**Physiology**	45 minutes	Dr. Ruqayya	Lecture	Lecture hall – 2,

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• Define graded reflexes. • List the root values of reflexes.					Ground floor, Block-A.
STRETCH REFLEX **At the end of this lecture 2nd year MBBS students will be able to:** • Define stretch, inverse stretch reflex and conditioned reflex. • Describe the muscle spindle and knee jerk. • List the properties of reflexes. • Describe the static & dynamic response of a muscle. • Explain alpha and Gamma co activation.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
SYRINGOMYELIA **At the end of this lecture 2nd year MBBS students will be able to:** • Define Syringomyelia. • Describe the etiopathogenesis of syringomyelia.	**Pathology**	60 minutes	Dr. Ghazal Irfan	Lecture	Lecture hall – 2, Ground floor, Block-A.
LESIONS OF SPINAL CORD **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the various clinical presentations of spinal cord disorders correlating with its organization, structure and function.	**Medicine**	60 minutes	Dr. Sumayya	Lecture	Lecture hall – 2, Ground floor, Block-A.

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KETOLYSIS **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the utilization of ketone bodies by extra-hepatic tissues. • Discuss the regulation of ketolysis.	**Biochemistry**	45 minutes	Dr. Iffat Ara Aziz	Lecture	Lecture hall – 2, Ground floor, Block-A.
GOLGI TENDON REFLEX-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Define golgi tendon reflex and its function • Explain the Functions of Gamma Efferent System. • Describe the Inverse Stretch Reflex (lengthening reaction).	**Physiology**	45 minutes	Dr. Qamer Aziz	Lecture	Lecture hall – 2, Ground floor, Block-A.
GOLGI TENDON REFLEX-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the types of polysynaptic reflexes & their level of integration. • Describe the Physiological Significance of these reflexes. • List the differences between Muscle spindle & Golgi Tendon Organ.	**Physiology**	45 minutes	Dr. M.Ali	Lecture	Lecture hall – 2, Ground floor, Block-A.

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BROWN SEQUARD SYNDROME **At the end of this lecture 2nd year MBBS students will be able to:** • Recall the physiology of ascending and descending tracts. • Define Brown sequad syndrome • Discuss the motor and sensory effects in Brown sequad syndrome.	**Physiology**	60 minutes	Dr. Saba Abrar Dr. Sobia Khan Dr. Saba Leeza	Small Group Teaching	Lecture hall – 2, Ground floor, Block-A.
EXAMINATION OF MOTOR SYSTEM **At the end of this practical 2nd year MBBS students will be able to:** • Recall the components of motor system. • Examine the grading, power, tone of different muscles of upper & lower limbs. • Explain the different deep tendon reflexes and demonstrate with the help of clinical hammer. • Determine the tracts of transmission. • Explain the different types of gait with the underlying lesion. • Identify the abnormalities related with motor system.	**Physiology**	120 minutes	Dr. Sobia	Practical	Physiology laboratory, First floor, Block-A
HEMISECTION OF SPINAL CORD **At the end of this lecture 2nd year MBBS students will be able to:** • Explain the hemi section of spinal cord.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2,

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• Describe the changes with lesion at the lumbar or thoracic level.					Ground floor, Block-A.
INTRODUCTION OF BRAINSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • List the parts of the brain stem. • Discuss the main anatomical connections of the brain stem.	**Anatomy**	45 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.
ROLE OF BRAINSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • List the nuclei of brain stem. • List the functions of brain stem. • Explain the function of brain stem on anti-gravity muscles • Explain Decerebrate rigidity.	**Physiology**	60 minutes	Dr. Saleem	Lecture	Lecture hall – 2, Ground floor, Block-A.
EXTERNAL STRUCTURE OF MEDULLA OBLONGATA **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the gross appearance of medulla oblongata.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Describe the external appearance of medulla oblongata. • Describe the origin of different cranial nerves from the medulla oblongata. • Summarize the function of medulla oblongata.					
INTERNAL STRUCTURE OF MEDULLA OBLONGATA-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the internal appearance of medulla oblongata. • Develop a three dimensional picture of cut section of medulla oblongata.	**Anatomy**	60 minutes	Dr. Uzma	Lecture	Lecture hall – 2, Ground floor, Block-A.
PYRAMIDAL AND EXTRA-PYRAMIDAL TRACTS **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss Pyramidal tract and Extrapyramidal tracts. • Discuss the origin, termination and function of Pyramidal tract and Extrapyramidal tracts. • Explain extrapyramidal disorders.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.

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INTERNAL STRUCTURE OF MEDULLA OBLONGATA-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe comparison of the different level of the medulla oblongata. • Summarize the details of medulla oblongata.	**Anatomy**	45 minutes	Dr. Uzma	Lecture	Lecture hall – 2, Ground floor, Block-A.
UPPER MOTOR NEURONE LESIONS **At the end of this lecture 2nd year MBBS students will be able to:** • Define Upper motor neurons • List the features of upper motor neuron syndrome. • Describe the features of upper motor neuron lesion.	**Physiology**	45 minutes	Dr. Qamar	Lecture	Lecture hall – 2, Ground floor, Block-A.
LOWER MOTOR NEURONE LESIONS **At the end of this lecture 2nd year MBBS students will be able to:** • Define Lower motor neurons. • List the features of lower motor lesion. • Describe the features of lower motor neuron lesions.	**Physiology**	60 minutes	Dr. Qamar	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Recognize the differences between Upper and Lower motor neuron lesions.					
EXAMINATION OF DEEP REFLEXES **At the end of this practical 2nd year MBBS students will be able to:** • Understand and define Deep Tendon Reflexes. • Distinguish between hyper and hypo-tonic Deep Tendon Reflexes. • Gain a basic knowledge of Deep Tendon Reflex grading. • Describe the examination for biceps, triceps, supinator reflexes, jaw jerk, Achilles' tendon reflex, and knee jerk. • Identify the signs and lesions of reflex arc of associated reflex.	**Physiology**	120 minutes	Dr. Sobia	Practical	Physiology laboratory, First floor, Block-A
DEMYELINATING DISORDERS **At the end of this lecture 2nd year MBBS students will be able to:** • Classify Demyelinating Disorders • Define Multiple Sclerosis. • Describe the etiopathogenesis of multiple sclerosis.	**Pathology**	60 minutes	Dr. Nasima Iqbal	Lecture	Lecture hall – 2, Ground floor, Block-A.

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UPPER AND LOWER MOTOR NEURONE LESIONS **At the end of this lecture 2nd year MBBS students will be able to:** • Differentiate between upper and lower motor neuron lesions in terms of their sign and symptoms with the knowledge of structure and types of fiber bundles traversing the brain and their function.	**Medicine**	45 minutes	Dr. Anita	Lecture	Lecture hall – 2, Ground floor, Block-A.
DEVELOPMENT OF BRAINS-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the development of fore brain, midbrain, and hindbrain.	**Anatomy**	45 minutes	Dr. Uzma	Lecture	Lecture hall – 2, Ground floor, Block-A.
PONS-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the pons, its parts, location, and relations.	**Anatomy**	45 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
PONS-II **At the end of this lecture 2nd year MBBS students will be able to:**	**Anatomy**	45 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• List the position of several cranial nerve nuclei, and the paths taken by various ascending and descending nerve tracts. • Describe the different level of the pons.					
MID BRAIN -1 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the midbrain and recognize the cut sections of the midbrain.	**Anatomy**	60 minutes	Dr. Mubashra	Lecture	Lecture hall – 2, Ground floor, Block-A.
MID BRAIN -2 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe comparison of the different levels of the midbrain. • List the position and the paths of several cranial nerve nuclei of the midbrain.	**Anatomy**	60 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.
B-COMPLEX VITAMINS-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Recall the classification of vitamins. • Identify the dietary sources and biological active forms of B1, B2 and B3 vitamins. • Describe the metabolic role of B1, B2 and B3 vitamins.	**Biochemistry**	60 minutes	Dr. Iffat Ara Aziz	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Discuss the diseases which occur due to deficiencies of B1, B2 and B3 vitamins.					
CEREBELLUM **At the end of this lecture 2nd year MBBS students will be able to:** • Explain the structure and function of the cerebellum. • Describe the functional areas of the cerebellar cortex. • List the intracerebellar nuclei. • Discuss the cerebellar cortical mechanism.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
CEREBELLAR PATHWAY **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the cerebellar cortical mechanism. • Describe the functional areas of the cerebellar cortex. • List the Intracerebellar nuclei. • Discuss the cerebellar pathways.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
HISTOLOGY OF CEREBELLUM **At the end of this lecture 2nd year MBBS students will be able to:**	**Anatomy**	60 minutes	Dr. Inayat	Lecture	Lecture hall – 2,

• Discuss the basic micro structure of the cerebellum. • Comparison of structural details in different regions of the cerebellum. • Discuss the transverse sections of cerebellum at different levels. • Develop a three dimensional picture of cut section of cerebellum.					Ground floor, Block-A.
CEREBELLUM **<u>At the end of this practical 2nd year MBBS students will be able to:</u>** • Identify the slide and adjust under microscope • Visualize the slide by both eyes in binocular lens. • Analyze the slide by low and high magnification. • Identify the microscopic features of cerebellum. • Discuss the basic micro structure of the cerebellum. • Discuss the cerebellum at different levels.	**Anatomy**	120 minutes	Dr. Hina	Practical	Histology laboratory, First floor, Block-A

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FUNCTIONS OF PATHWAY OF CEREBELLUM **At the end of this lecture 2nd year MBBS students will be able to:** • Define the physiological tracts of cerebellum. • List the functions of each part of cerebellum. • State the functions of principle afferent systems to the cerebellum (THE NEURONAL CIRCUIT). • Explain "Turn – O & Turn – Off" mechanism.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
EXAMINATION OF CEREBELLUM **At the end of this practical 2nd year MBBS students will be able to:** • Describe the examination for different lobes of cerebellum • Identify the signs to elicit for cerebellar lesions • Explain the Romberg's sign to differentiate ataxia.	**Physiology**	120 minutes	Dr. Sobia	Practical	Physiology laboratory, First floor, Block-A
B-COMPLEX VITAMINS-II **At the end of this lecture 2nd year MBBS students will be able to:** • Identify the dietary sources and biological active forms of B5, B6 and B7 vitamins.	**Biochemistry**	60 minutes	Dr. Iffat Ara Aziz	Lecture	Lecture hall – 2, Ground floor, Block-A.

• List the clinical indications for prescribing B6 supplements. • Recognize that consumption of raw eggs can lead to Biotin deficiency.					
ABNORMALITIES OF CEREBELLUM **At the end of this lecture 2nd year MBBS students will be able to:** • Recall the functional division of cerebellum. • Explain physiological role of cerebellum in regulation of movements. • List the abnormalities of cerebellum like ataxia, drunken gait, nystagmus, past pointing, dysdiadochokinesia, and intentional tremors.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
LESION OF CEREBELLUM **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the clinical conditions associated with cerebellar dysfunction • Identify sign and symptoms associated with cerebellar lesion.	**Medicine**	45 minutes	Dr. Anita	Lecture	Lecture hall – 2, Ground floor, Block-A.
INTEGRATIVE METABOLISM-1 **At the end of this lecture 2nd year MBBS students will be able to:**	**Biochemistry**	60 minutes	Dr. Benish	Lecture	Lecture hall – 2,

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• Recall the pathways involved in energy metabolism. • Define integration of metabolism. • Identify the 3 stages of energy production from nutrients.					Ground floor, Block-A.
GROSS ANATOMY OF CEREBRAL HEMISPHERE **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the cerebrum and its various lobes and surfaces.	**Anatomy**	45 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.
CEREBRAL CORTEX **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the various sulci and gyri present in the cerebrum.	**Anatomy**	45 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
CORTICAL AREA **At the end of this lecture 2nd year MBBS students will be able to:** • Describe different cortical areas. • Describe its blood supply.	**Anatomy**	45 minutes	Dr. Uzma	Lecture	Lecture hall – 2, Ground floor, Block-A.
HISTOLOGY OF CEREBRUM **At the end of this lecture 2nd year MBBS students will be able to:**	**Anatomy**	60 minutes	Dr. Inayat	Lecture	Lecture hall – 2,

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• List the layers of cerebral cortex • Discuss the internal structure of cerebral hemisphere. • Identify the various types of cells of cerebrum					Ground floor, Block-A.
CEREBRUM **<u>At the end of this practical 2nd year MBBS students will be able to:</u>** • Identify the slide and adjust under microscope. • Visualize the slide by both eyes in binocular lens. • Analyze the slide by low and high magnification. • Identify the microscopic features of cerebrum. • Discuss the basic microstructure of the cerebrum. • Discuss the cerebrum at different levels.	**Anatomy**	120 minutes	Dr. Hina	Practical	Histology laboratory, First floor, Block-A
WHITE MATTER OF CEREBRUM **<u>At the end of this lecture 2nd year MBBS students will be able to:</u>** • Describe the white matter of cerebrum.	**Anatomy**	60 minutes	Dr. Mubashra	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Describe the internal capsule and its parts.					
SUPERFICIAL REFLEXES IN HUMAN SUBJECTS **At the end of this practical 2nd year MBBS students will be able to:** • Describe the examination for corneal, conjunctival. • Define Babinski sign with the significance of positive and negative Babinski sign. • Describe pupillary light reflex along with its optic tract. • Differentiate between monosynaptic and polysynaptic reflexes with examples.	**Physiology**	120 minutes	Dr. Sobia Nabeel	Practical	Physiology laboratory, First floor, Block-A
DEVELOPMENT OF BRAIN-III **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the defects of forebrain, midbrain and hindbrain.	**Anatomy**	45 minutes	Dr. Uzma	Lecture	Lecture hall – 2, Ground floor, Block-A.
BASAL GANGLIA **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the basal ganglia. • Describe the basal nuclei, and their connections.	**Anatomy**	60 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Describe the functions of basal ganglia and their nuclei. • Analyze the clinical problem relate to basal nuclei.					
BASAL GANGLIA & ITS FUNCTION **At the end of this lecture 2nd year MBBS students will be able to:** • List the components of basal ganglia. • Summarize the functions of basal ganglia (caudate circuit and putamen circuit). • List the disorders of basal ganglia. • Discuss the abnormality in physiologic functions that leads to Parkinson's disease. • Define Huntington's disease.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
SPEECH **At the end of this lecture 2nd year MBBS students will be able to:** • Define speech. • List the areas of speech. • List the areas of motor cortex involved in language comprehension. • Explain the mechanism of speech involved in speaking the written & the heard words.	**Physiology**	60 minutes	Dr. Ruqayya	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• List the abnormalities of speech, sensory and motor aphasia.					
EMOTION & MOTIVATION **At the end of this lecture 2nd year MBBS students will be able to:** • Define emotions. • Classify types of emotions • Discuss the theories of emotion and emotional arousal • List the effects of emotions on health • Define motivation • Classify types of motivation • Describe the ways to increase motivation.	**Behavioural Sciences**	60 minutes	Dr. Azra Shaheen	Lecture	Lecture hall – 2, Ground floor, Block-A.
PARKINSONS DISEASE **At the end of this lecture 2nd year MBBS students will be able to:** • Define Parkinson's Disease. • Describe the etiopathogenesis of Parkinson's disease.	**Pathology**	45 minutes	Dr. Ghazal Irfan	Lecture	Lecture hall – 2, Ground floor, Block-A.
OVERVIEW OF PHARMACOLOGY OF PARKINSONS DISEASE **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss and understand the mechanistic pharmacology of Parkinson's disease.	**Pharmacology**	45 minutes	Dr. Hina	Lecture	Lecture hall – 2, Ground floor, Block-A.

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LESION OF BASAL GANGLIA **At the end of this lecture 2nd year MBBS students will be able to:** • Differentiate between pyramidal and extrapyramidal syndromes • Correlate the presentation of Parkinson's disease with the topographic anatomy and function of basal nuclei.	**Medicine**	60 minutes	Dr. Sumayya	Lecture	Lecture hall – 2, Ground floor, Block-A.
SLEEP-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Define sleep • Classify the types of sleep. • Explain the mechanism of REM and NREM Sleep. • Summarize sleep- wake cycle. • Explain the theories of sleep. • List the abnormalities of sleep.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
SLEEP-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Define sleep apnea. • Explain the difference between stages 3 & 4 of sleep.	**Physiology**	60 minutes	Dr. Saba Leeza	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Recognize characteristics of sleep deprivation. • Discuss the health benefits of sleep.					
STRESS & HEALTH **At the end of this lecture 2nd year MBBS students will be able to:** • Define stress and stressor • Identify the common stressors • List the Models/theories of stress • Describe the cognitive, behavioral and somatic features of stress • Associate stress and stressors with illness	**Behavioral Sciences**	60 minutes	Dr. Azra Shaheen	Lecture	Lecture hall – 2, Ground floor, Block-A.
SOMNIFEROUS POISONS-2 (OPIOIDS) **At the end of this lecture 2nd year MBBS students will be able to:** • Diagnose the Acute Signs & Symptoms of Opioid poisoning along with Treatment options • Diagnose the Chronic Signs & Symptoms of Opioid poisoning along with Treatment options. • Identify Fatal Dose & Fatal Period with Postmortem Appearances + ML Importance.	**Forensic Medicine**	60 minutes	Dr. Rafay Siddiqui	Lecture	Lecture hall – 2, Ground floor, Block-A.

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COUNSELLING **At the end of this lecture 2nd year MBBS students will be able to:** • The concept Counseling • Define the different Types of counseling • The role of providing information, emotional support and problem solving in different types of counseling.	**Behavioral Sciences**	60 minutes	Dr. Azra Shaheen	Lecture	Lecture hall – 2, Ground floor, Block-A.
INTEGRATIVE METABOLISM-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Identify the rate limiting reactions of energy metabolic pathways. • Describe the interconversion of carbohydrates and lipids and conversion of proteins to fats. • Describe the interconversion of carbohydrates and amino acids.	**Biochemistry**	60 minutes	Dr. Benish	Lecture	Lecture hall – 2, Ground floor, Block-A.
MEMORY-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Define memory. • List and explain the types of memory. • Discuss the role of synaptic facilitation & inhibition in memory formation. • Summarize papez circuit.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Explain positive & negative memory – sensitization and the habituation.					
MEMORY-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss molecular mechanism of facilitation. • Describe long term memory • Define coding of memory consolidation • Define declarative and skilled memory • Define dementia. • Explain different types of amnesia.	**Physiology**	60 minutes	Dr. Saba Leeza	Lecture	Lecture hall – 2, Ground floor, Block-A.
AGING **At the end of this lecture 2nd year MBBS students will be able to:** • Define aging • Discuss health problems related to aging • Describe the strategies and interventions that promote healthy aging.	**Community Medicine**	60 minutes	Dr. Ammara	Lecture	Lecture hall – 2, Ground floor, Block-A.
ALZHIEMERS DISEASE **At the end of this lecture 2nd year MBBS students will be able to:** • List the Types of Tremors • Define Alzheimer's disease.	**Pathology**	45 minutes	Dr. Ghazal Irfan	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Describe the etiopathogenesis of Alzheimer's disease.					
THALAMUS **At the end of this lecture 2nd year MBBS students will be able to:** • Define thalamus. • Describe the subdivision of thalamus. • List the nuclei of the thalamus.	**Anatomy**	45 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
THALAMIC CONNECTIONS **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the various connections of thalamus. • Describe the function of connections of thalamus.	**Anatomy**	60 minutes	Dr. Uzma	Lecture	Lecture hall – 2, Ground floor, Block-A.
HYPOTHALAMUS **At the end of this lecture 2nd year MBBS students will be able to:** • Identify the location and boundaries of the hypothalamus • Analyze the common clinical problems involving the hypothalamus.	**Anatomy**	60 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.
HYPOTHALAMIC CONNECTIONS **At the end of this lecture 2nd year MBBS students will be able to:**	**Anatomy**	45 minutes	Dr. Mubashara	Lecture	Lecture hall – 2,

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• List the main connections of the nuclei. • Describe the various connections of hypothalamus.					Ground floor, Block-A.
FUNCTION OF HYPOTHALAMUS-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the function of hypothalamus. • Recall the hormones released from hypothalamus, activating driving system of brain. • List the hypothalamic nuclei with their functions.	**Physiology**	45 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
FUNCTION OF HYPOTHALAMUS-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the role of hypothalamus in regulation of body temperature. • Explain the consequences of destruction of hypothalamic nuclei • Explain the feedback control by cerebral cortex.	**Physiology**	45 minutes	Dr. Qamar Aziz	Lecture	Lecture hall – 2, Ground floor, Block-A.
THALAMUS & HYPOTHALAMUS **At the end of this practical 2nd year MBBS students will be able to:**	**Anatomy**	120 minutes	Dr. Hina	Practical	Histology lab, 1st floor, block A

• Identify the slide and adjust under microscope • Visualize the slide by both eyes in binocular lens. • Analyze the slide by low and high magnification. • Define thalamus and hypothalamus. • Describe the subdivision of thalamus & hypothalamus. • Identify the microscopic features of thalamus and hypothalamus.					
METABOLISM OF WELL-FED STATE-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Define the metabolic states of the body i.e. well-fed state, fasting state and starvation state. • Identify the organs involved in maintenance of body fuels in well fed and fasting states. • List the factors involved in regulation of well-fed state.	**Biochemistry**	45 minutes	Dr. Benish	Lecture	Lecture hall – 2, Ground floor, Block-A.
RETICULAR FORMATION **At the end of this lecture 2nd year MBBS**	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2,

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students will be able to: • Summarize the structure and function of the reticular formation. • Discuss the parts of the reticular formation and its connecting pathway.					Ground floor, Block-A.
LIMBIC SYSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • Summarize the structure and function of the limbic system. • Discuss the parts of the limbic system and its connecting pathway.	**Anatomy**	45 minutes	Dr. Mubashra	Lecture	Lecture hall – 2, Ground floor, Block-A.
FUNCTION OF LIMBIC SYSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • List the components of limbic system. • Define the physiologic arrangement of limbic cortex. • Summarize the function of limbic areas. • Describe the abnormalities of limbic system.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
VENTRICULAR SYSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the ventricular system.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2,

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• Illustrate the locations, functions, the origins and the fate of cerebrospinal fluid. • Recognize the structure and extend of ventricular system.					Ground floor, Block-A.
LATERAL VENTRICLE **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the boundaries of lateral ventricle. • Discuss its relation. • Describe the applied anatomy of it.	**Anatomy**	60 minutes	Dr. Inayat	Lecture	Lecture hall – 2, Ground floor, Block-A.
THIRD VENTRICLE **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the boundaries of 3rd ventricle. • Discuss its relation. • Describe the applied anatomy of it.	**Anatomy**	60 minutes	Dr. Shahid	Small Group Teaching	Histology laboratory, First floor, Block-A
FOURTH VENTRICLE **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the boundaries of 4th ventricle. • Discuss its relation. • Describe the applied anatomy of it.	**Anatomy**	60 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.
FORMATION OF CEREBROSPINAL FLUID	**Physiology**	60 minutes	Dr. Ruqayya	Lecture	Lecture hall – 2,

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At the end of this lecture 2nd year MBBS students will be able to: • Name the meninges of the brain. • Discuss the functions of the meninges. • List the ventricles in the brain. • Define Cerebrospinal fluid. • Describe the formation and circulation of cerebrospinal fluid.					Ground floor, Block-A.
FUNCTION OF CEREBROSPINAL FLUID **At the end of this lecture 2nd year MBBS students will be able to:** • List the functions of Cerebrospinal fluid. • Name the parts of Circle of Willis and blood flow to the cerebral hemisphere.	**Physiology**	45 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
CEREBRAL EDEMA **At the end of this lecture 2nd year MBBS students will be able to:** • Define cerebral edema. • Discuss its types and etiological factors.	**Medicine**	45 minutes	Dr. Anita	Lecture	Lecture hall – 2, Ground floor, Block-A.
HYDROCEPHALUS **At the end of this lecture 2nd year MBBS students will be able to:** • Define hydrocephalus.	**Physiology**	60 minutes	Dr. Qamar Aziz	Lecture	Lecture hall – 2,

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• List the causes of hydrocephalus • Discuss the types of hydrocephalus and their pathophysiology. • Explain clinical manifestation in infant, childhood and adult.					Ground floor, Block-A.
INCREASED INTRACRANIAL PRESSURE **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss signs and symptoms of increased intracranial pressure. • Discuss the effects of increased intracranial pressure on the structure of craniospinal meninges and ventricular system.	**Medicine**	60 minutes	Dr. Sumayya	Lecture	Lecture hall – 2, Ground floor, Block-A.
HYDROCEPHALUS AND RAISED INTRACRANIAL PRESSURE: **At the end of this lecture 2nd year MBBS students will be able to:** • Identify the signs and symptoms of raised intracranial pressure • Discuss different varieties of hydrocephalus • Distinguish between obstructive and communicating variety of hydrocephalus.	**Surgery**	45 minutes	Dr. Danish	Lecture	Lecture hall – 2, Ground floor, Block-A.

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LUMBAR PUNCTURE **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the changes occurring in C.S.F volume in various disease. • Discuss the indications and contraindications and process for lumbar puncture.	**Medicine**	45 minutes	Dr. Adil Khan	Lecture	Lecture hall – 2, Ground floor, Block-A.
METABOLISM OF WELL-FED STATE-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the metabolic changes in carbohydrate metabolism occurring in liver in well fed state. • Describe the metabolic changes in fat and protein metabolism occurring in liver in well fed state. • Describe the metabolic changes in carbohydrate and fat metabolism occurring in adipose tissue in well fed state.	**Biochemistry**	60 minutes	Dr. Benish	Lecture	Lecture hall – 2, Ground floor, Block-A.
CRANIAL NERVES I, II **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the location of olfactory nerve, its receptors .	**Anatomy**	60 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Discuss the pathway of olfactory nerve. • Recognize the location of optic nerve, its receptors. • Discuss the pathway of optic nerve.					
CRANIAL NERVES III, IV <u>At the end of this lecture 2nd year MBBS students will be able to:</u> • Recognize the location of oculomotor nerve, its cranial nuclei and their connections. • Discuss the pathway of oculomotor nerve. • Recognize the location of trochlear nerve, its cranial nuclei and their connections. • Discuss the pathway of trochlear nerve.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
CRANIAL NERVE VI **<u>At the end of this lecture 2nd year MBBS students will be able to:</u>** • Recognize the location of abducent nerve, its cranial nuclei and their connections. • Discuss the pathway of abducent nerve.	**Anatomy**	45 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
EXAMINATION OF CRANIAL NERVES I, II and III **<u>At the end of this practical 2nd year MBBS students will be able to:</u>** • Identify the correct steps for cranial nerve examination I-III.	**Physiology**	120 minutes	Dr. Sobia Nabeel	Practical	Physiology laboratory, First floor, Block-A

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• Perform clinical examination of these cranial nerves. • Identify common clinical abnormalities. • Report the examination findings. • Explain the nerve type, division and functions. • Explain the nervous pathways of the respective cranial nerves.					
EXAMINATION OF CRANIAL NERVES IV, V & VI **At the end of this practical 2nd year MBBS students will be able to:** • Explain the nervous pathways of these nerves. • Describe the types of nerves, their origin and functions with practical demonstration. • Discuss the divisions of trigeminal nerve and their functions on defined facial areas. • Describe the facial sensations perceived by trigeminal nerve. • Discuss the symptoms found with trigeminal nerve lesions. • Revise the functional loss due to trochlear and abducent nerve lesions.	**Physiology**	120 minutes	Dr. Muhammad Ali	Practical	Physiology laboratory, First floor, Block-A
CRANIAL NERVE VII **At the end of this lecture 2nd year MBBS**	**Anatomy**	45 minutes	Dr. Mubashara	Lecture	Lecture hall – 2,

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students will be able to: • Recognize the location of fascial nerve, its cranial nuclei and their connections. • Discuss the pathway of fascial nerve.					Ground floor, Block-A.
CRANIAL NERVES VIII, IX **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the location of vestibulocochlear nerve, its cranial nuclei and their connections. • Discuss the pathway of vestibulocochlear nerve. • Recognize the location of glossopharyngeal nerve, its cranial nuclei and their connections. • Discuss the pathway of glossopharyngeal nerve.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
EXAMINATION OF CRANIAL NERVES VII, VIII & IX **At the end of this practical 2nd year MBBS students will be able to:** • Explain the type and pathways of the respective cranial nerves. • Define facial palsy, differentiate between Facial palsy and Bell's palsy.	**Physiology**	120 minutes	Dr. Sobia Nabeel	Practical	Physiology laboratory, First floor, Block-A

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• Explain the difference between upper and lower motor neuronal lesions specifically in facial palsy. • Discuss the facial nerve carrying taste sensation with demonstration.					
VESTIBULAR APPARATUS **At the end of this lecture 2nd year MBBS students will be able to:** • Explain the components of vestibular apparatus. • Define synergic pairs. • Explain the three main functions of vestibular apparatus. • Discuss the mechanism of stimulation of vestibular apparatus.	**Physiology**	60 minutes	Dr. Qamar Aziz	Lecture	Lecture hall – 2, Ground floor, Block-A.
VESTIBULAR PATHWAY **At the end of this lecture 2nd year MBBS students will be able to:** • Define vestibular pathway • Discuss center for integration of different sensory stimuli to maintain balance. • Explain VOR (Vestibulo-ocular reflex). • Define nystagmus.	**Physiology**	60 minutes	Dr. Ruqayya	Lecture	Lecture hall – 2, Ground floor, Block-A.
METABOLISM OF WELL-FED STATE-3 **At the end of this lecture 2nd year MBBS**	**Biochemistry**	60 minutes	Dr. Benish	Lecture	Lecture hall – 2,

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students will be able to: • Describe the metabolic changes in carbohydrate, fat and protein metabolism occurring in skeletal tissue in well fed state • Describe the metabolic changes in carbohydrate and fat metabolism occurring in brain in well fed state. • Discuss the role of insulin and glucagon in regulation of well-fed state.					Ground floor, Block-A.
CRANIAL NERVES X **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the location of vagus nerve, its cranial nuclei and their connections. • Discuss the pathway of vagus nerve.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.
CRANIAL NERVES XI & XII **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the location of accessory nerve, its cranial nuclei and their connections. • Discuss the pathway of accessory nerve. • Recognize the location of hypoglossal nerve, its cranial nuclei and their connections. • Discuss the pathway of hypoglossal nerve.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.

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EXAMINATION OF CRANIAL NERVES X, XI & XII **At the end of this practical 2nd year MBBS students will be able to:** • Describe the pathways and functions of vagus, accessory and hypoglossal nerves. • Demonstrate the palatal reflex & describe the respective nerve lesion. • Discuss the lesion of accessory nerve with practical demonstration. • Discuss the untoward effects seen by the lesion of vagus nerve with practical demonstration. • Differentiate between a supranuclear lesion from an infra nuclear lesion. • Describe the signs and symptoms of hypoglossal nerve lesion and name the muscles involved with practical demonstration.	**Physiology**	120 minutes	Dr. Sobia Nabeel	Practical	Physiology laboratory, First floor, Block-A
BLOOD SUPPLY OF THE BRAIN **At the end of this lecture 2nd year MBBS students will be able to:** • List the main arteries and veins supplying the brain.	**Anatomy**	60 minutes	Dr. Shahid	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Explain the areas of the cerebral cortex supplied by a particular artery. • Describe the circle of Willis and blood supply to the internal capsule. • Discuss the dysfunction that would result if the artery were blocked.					
CEREBRAL BLOOD FLOW **At the end of this lecture 2nd year MBBS students will be able to:** Describe arterial & venous vascular disorders and their clinical manifestations.	**Physiology**	45 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
TRAUMA TO BRAIN AND SPINAL CORD **At the end of this lecture 2nd year MBBS students will be able to:** • List Bone Fragmentation / Skull Fractures. • Explain about Diffuse Axonal Injury (DAI), Diffuse Neuronal Injury (DNI), Diffuse Vascular Injury (DVI). • Discuss Intracranial Hemorrhages/Hematomas, & Brain Swelling (Cerebral Edema). • Discuss Penetrating Wounds / Firearm Wounds & Contusion of the Spinal Cord, Railway Spine (Concussion of the spinal cord).	**Forensic Medicine**	60 minutes	Dr. Jan e Alam	Lecture	Lecture hall – 2, Ground floor, Block-A.

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CEREBROVASCULAR DISEASES **At the end of this lecture 2nd year MBBS students will be able to:** • Define **Stroke** • Classify Stroke • Describe the Types of Stroke along with their etiopathogenesis & Clinical Manifestations.	**Pathology**	60 minutes	Dr. Nasima Iqbal	Lecture	Lecture hall – 2, Ground floor, Block-A.
CEREBROVASCULAR ACCIDENT-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Define the terms stroke, Cerebrovascular Accidents (CVA) & Transient Ischemic Attack (TIA) • Discuss the causes and risk factors for cerebrovascular diseases • Identify the signs & symptoms related to stroke.	**Medicine**	60 minutes	Dr. Anita	Lecture	Lecture hall – 2, Ground floor, Block-A.
CEREBROVASCULAR ACCIDENT-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Distinguish ischemic stroke (cerebral infarct) from hemorrhagic stroke (intracerebral hemorrhage) in terms of etiology and pathology	**Medicine**	45 minutes	Dr. Sumayya	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Discuss clinical findings associated with stroke of different arterial territories (anterior and posterior circulation).					
VASCULAR NEUROSURGICAL SCIENCE: **<u>At the end of this lecture 2nd year MBBS students will be able to:</u>** • Recall the blood supply of brain. • Discuss circle of Willis and sites of aneurysm. • Describe clinical features of subarachnoid hemorrhage on the basis of history and examination. • Discuss intracerebral hemorrhage and its clinical features.	**Surgery**	60 minutes	Dr. Sidrah	Lecture	Lecture hall – 2, Ground floor, Block-A.
METABOLISM OF FASTING STATE-1 **<u>At the end of this lecture 2nd year MBBS students will be able to:</u>** • Define fasting state and starvation state • Identify the factors involved in maintenance of fasting state. • List the conditions due to which fasting or starvation state can occur. • Describe the metabolic changes in carbohydrate and fat metabolism occurring in liver and adipose tissue in fasting state.	**Biochemistry**	60 minutes	Dr. Benish	Lecture	Lecture hall – 2, Ground floor, Block-A.

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AUTONOMIC NERVOUS SYSTEM-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the organization of the autonomic nervous system. • Describe the autonomic ganglia. • Explain the function of autonomic nervous system.	**Anatomy**	60 minutes	Dr. Mubashra	Lecture	Lecture hall – 2, Ground floor, Block-A.
AUTONOMIC NERVOUS SYSTEM-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the significant autonomic innervations. • Discuss some significant physiological reflexes involving the nervous system.	**Anatomy**	45 minutes	Dr. Uzma	Lecture	Lecture hall – 2, Ground floor, Block-A.
SYMPATHETIC AND PARASYMPATHETIC NERVOUS SYSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • Illustrate important anatomical, differences between the sympathetic and parasympathetic parts.	**Anatomy**	60 minutes	Dr. Hina	Lecture	Lecture hall – 2, Ground floor, Block-A.

• Explain the function of sympathetic nervous system. • Explain the function of parasympathetic nervous system.					
SYMPATHETIC NERVOUS SYSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • Explain the fight-or-flight response. • Discuss the hormones being secreted from the adrenal glands during the fight-or-flight response. • Discuss the common signs and symptoms of sympathetic nervous system problems.	**Physiology**	60 minutes	Dr. Saba Abrar	Lecture	Lecture hall – 2, Ground floor, Block-A.
PARASYMPATHETIC NERVOUS SYSTEM **At the end of this lecture 2nd year MBBS students will be able to:** • List of the components of parasympathetic nervous system. • Discuss the cranial nerves having parasympathetic activity. • Describe the parasympathetic ganglia in the head and neck, their locations and target organs.	**Physiology**	60 minutes	Dr. Ruqayya	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Describe the sacral parasympathetic outflow and its target organs with demonstration of examples.					
OVERVIEW OF PHARMACOLOGY OF AUTONOMIC NERVOUS SYSTEM. **At the end of this lecture 2nd year MBBS students will be able to:** Discuss and understand the mechanistic pharmacology of Autonomic nervous system.	**Pharmacology**	60 minutes	Dr. Hina	Lecture	Lecture hall – 2, Ground floor, Block-A.
METABOLISM OF FASTING STATE-2 **At the end of this lecture 2nd year MBBS students will be able to:** • Describe the metabolic changes in carbohydrate, protein & fat occurring in skeletal muscle in fasting state. • Describe the metabolic changes in carbohydrate and fat metabolism occurring in brain in fasting state. • Identify the role of kidneys in fasting state.	**Biochemistry**	60 minutes	Dr. Benish	Lecture	Lecture hall – 2, Ground floor, Block-A.
SCHOOL HEALTH-1 **At the end of this lecture 2nd year MBBS students will be able to:** • Define School Health. • Discuss the components of coordinated school health program.	**Community Medicine**	60 minutes	Dr. Nazia Jameel	Lecture	Lecture hall – 2, Ground floor, Block-A.

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SCHOOL HEALTH-II **At the end of this lecture 2nd year MBBS students will be able to:** • Discuss the responsibilities of school health services team members • List the functions of school health services (levels of prevention)	**Community Medicine**	45 minutes	Dr. Nazia Jameel	Lecture	Lecture hall – 2, Ground floor, Block-A.
EQUALITY, JUSTICE AND EQUITY **At the end of this lecture 2nd year MBBS students will be able to:** • Define the principle of justice in bioethics. • Discuss importance of justice in health care profession. • Discuss difference between equality and equity.	**Bioethics**	60 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.
NEGATIVE THOUGHTS/ANGER AND ETHICAL ISSUE **At the end of this lecture 2nd year MBBS students will be able to:** • Recognize the types of negative thinking.	**Bioethics**	60 minutes	Dr. Mubashara	Lecture	Lecture hall – 2, Ground floor, Block-A.

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• Define anger. • Discuss the management of anger. • Explain ethical issue related to researcher and research participants.					
RESEARCH TOPIC SELECTION **At the end of this lecture 2nd year MBBS students will be able to:** • Define the criteria for topic selection. • Explain the rationale of selecting a new topic.	**Research**	45 minutes	Miss Maria	Lecture	Lecture hall – 2, Ground floor, Block-A.
RESEARCH PROJECT & ITS COMPONENTS **At the end of this lecture 2nd year MBBS students will be able to:** • Define research synopsis. • List the components of a research project. • Describe the sections of a research project.	**Research**	45 minutes	Miss Maria	Lecture	Lecture hall – 2, Ground floor, Block-A.
QUESTIONNAIRE DEVELOPMENT **At the end of this lecture 2nd year MBBS students will be able to:** • Define a research questionnaire. • Explain the development of a research questionnaire.	**Research**	45 minutes	Miss Maria	Lecture	Lecture hall – 2, Ground floor, Block-A.

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INFORMED CONSENT & ITS SIGNIFICANCE **At the end of this lecture 2nd year MBBS students will be able to:** • Define informed consent. • Summarize the ways of establishing informed consent. • Explain the content of an informed consent form.	**Research**	60 minutes	Miss Maria	Lecture	Lecture Hall-2, ground floor, Block-A

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REFERENCE BOOKS AND OTHER READING RESOURCES:

Gross Anatomy	BD Chaurasia's Handbook of GENERAL ANATOMY Netter Atlas of HumanAnatomy Snell's Clinical Anatomy by Regions Gray's Anatomy for Students.
Embryology	Langman's Medical Embryology The Developing Human by Keith L.Moore
Histology	Histology by Laiq Hussain Siddiqui
Physiology	Guyton and Hall. Textbook of Medical Physiology, 13th Edition. Ganong's Review of Medical Physiology, 24th Edition. Essentials of Medical Physiology by K.Sembulingam
Biochemistry	Textbook of Medical Biochemistry M.N.Chatterjee and Rana Shinde Textbook of Biochemistry for Medical Students Damodaran M Vasudevan and S. Sreekumari Harper's Illustrated Biochemistry
Pathology	Robin`s BasicPathology-10thEdition
Pharmacology	Essential - Bertram G. Katzung. Basic and Clinical Pharmacology, 14th Edition. 2017. - Katzung and Trevor's pharmacology Examination and Board Review 11th Edition 2015. Recommended - Lippincott's illustrated review of Pharmacology. 6th Edition. 2015.
Pakistan Studies	1. Burki, Shahid Javed. State & Society in Pakistan, The Macmillan Press Ltd 1980. 2. Akbar, S. Zaidi. Issue in Pakistan's Economy. Karachi: Oxford University Press, 2000. 3. . SM. Burke and Lawrence Ziring. Pakistan's Foreign policy: An Historical analysis. Karachi: Oxford University Press, 1993. 4. Mehmood, Safdar. Pakistan Political Roots & Development. Lahore, 1994.

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	5. Wilcox, Wayne.The Emergence of Bangladesh., Washington: American Enterprise, Institute of Public Policy Research, 1972. 6. Mehmood, Safdar. Pakistan KayyunToota, Lahore: Idara-e-Saqafat- e-Islamia, Club Road, nd. 7. Amin, Tahir. Ethno - National Movement in Pakistan, Islamabad: Institute of Policy Studies, Islamabad. 8. Ziring, Lawrence. Enigma of Political Development. Kent England: WmDawson& sons Ltd, 1980. 9. Zahid, Ansar. History & Culture of Sindh. Karachi: Royal Book Company, 1980. 10. Afzal, M Rafique. Political Parties in Pakistan, Vol. I, II & III. Islamabad: National Institute of Historical and cultural Research, 1998.
Community Medicine	Ilyas M, Public Health and Community Medicine, 7th Edition, Karachi, Pakistan, Time Publisher, 2007. Maxcy-Rosenau-Last, public Health and Preventive Medicine, 13th Edition, USA, Prentice-Hall International Inc, 1992. K.Park, Preventive and Social Medicine, 20th Edition, Jabalpur (India), M/s BanarsidasBhanot, Publisher, 2009.
General Medicine	Davidson`s Principles and Practice of Medicine-22nd Edition
Clinical Examination	Talley and O'Connor's Clinical Examination-6th Edition
General Surgery	Bailey And Love Short Practice Of Surgery, 27th Edition Last's anatomy 12th edition Snell's anatomy by regions 10thedition
Research	Introduction to Research in Health Sciences- Stephen Polgar, Shane A. Thomas. Biomedical Research Proposal Writing- Syed Sharaf Ali Shah, ZarfshanTahir, Rozina Karmaliani. Epidemiology - Leon Gordis; Fifth Edition.

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PEARLs	https://www.mededportal.org/publication/10610/
Paediatrics	Nelson Textbook of Pediatric 21st edition. Textbook of Paediatrics (PPA) Fifth edition. Basis of Pediatrics (Pervez Akbar Khan) 10th edition

ASSESSMENT METHODS:

THEORY:

❖ **Essay Questions- Short Essay Questions (SEQs)** are used to assess objectives covered in each module.

- 6 SEQs are given (no choice).
- Time duration 90 minutes.
- Students write the answer in the provided answer sheet.

❖ **Multiple Choice Questions (MCQs)** are used to assess objectives covered in each module.

- An MCQ has a statement or clinical scenario followed by four options (likely answer).
- Students after reading the statement/scenario select ONE, the most appropriate response from the given list of options.
- Correct answer carries one mark, and incorrect 'zero mark'. There is no negative marking.
- Students mark their responses on specified computer-based/OMR sheet designed for BMC, BMU.

❖**OSPE/OSCE: Objective Structured Practical/Clinical Examination:**

- Each student will be assessed on the same content and have same time to complete the task.
- Comprise of 05 stations.

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- Each station may assess a variety of clinical tasks; these tasks may include history taking, physical examination, skills and application of skills and knowledge.
- Stations are observed, unobserved, interactive and rest stations.
- Observed and interactive stations will be assessed by internal or external examiners.
- Unobserved will be static stations in which there may be an X-ray, Labs reports, pictures, Biochemical estimation tests graph construction tasks or clinical scenarios with related questions for students to answer.
- Rest station is a station where there is no task given and in this time student can organize his/her thoughts.

INTERNAL EVALUATION:

- Students will be assessed to determine achievement of module objectives through the following:
- **Module Examination:** will be scheduled on completion of each module. The method of examination comprises theory exam which includes MCQs and OSPE (Objective Structured Practical Examination).

➢ **Formative Assessment of students combined**: Quiz, viva, practical, assignment, small group activities such as CBL, online assessment, and Practical journal work.

➢ Marks and attendance of modular examination and formative assessment respectively will constitute 20% weightage which will be added to the marksheet of Second Professional Annual Examination.

FORMATIVE ASSESSMENT:

- Individual departments or group pf departments may hold quiz or short answer questions to help students assess their own learning.
- The marks obtained are not included in the internal evaluation.

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More than 75% attendance is needed to sit for the modular and final examinations