Faisalabad Medical University

BLOCK J

4th Year MBBS

Approval Statement

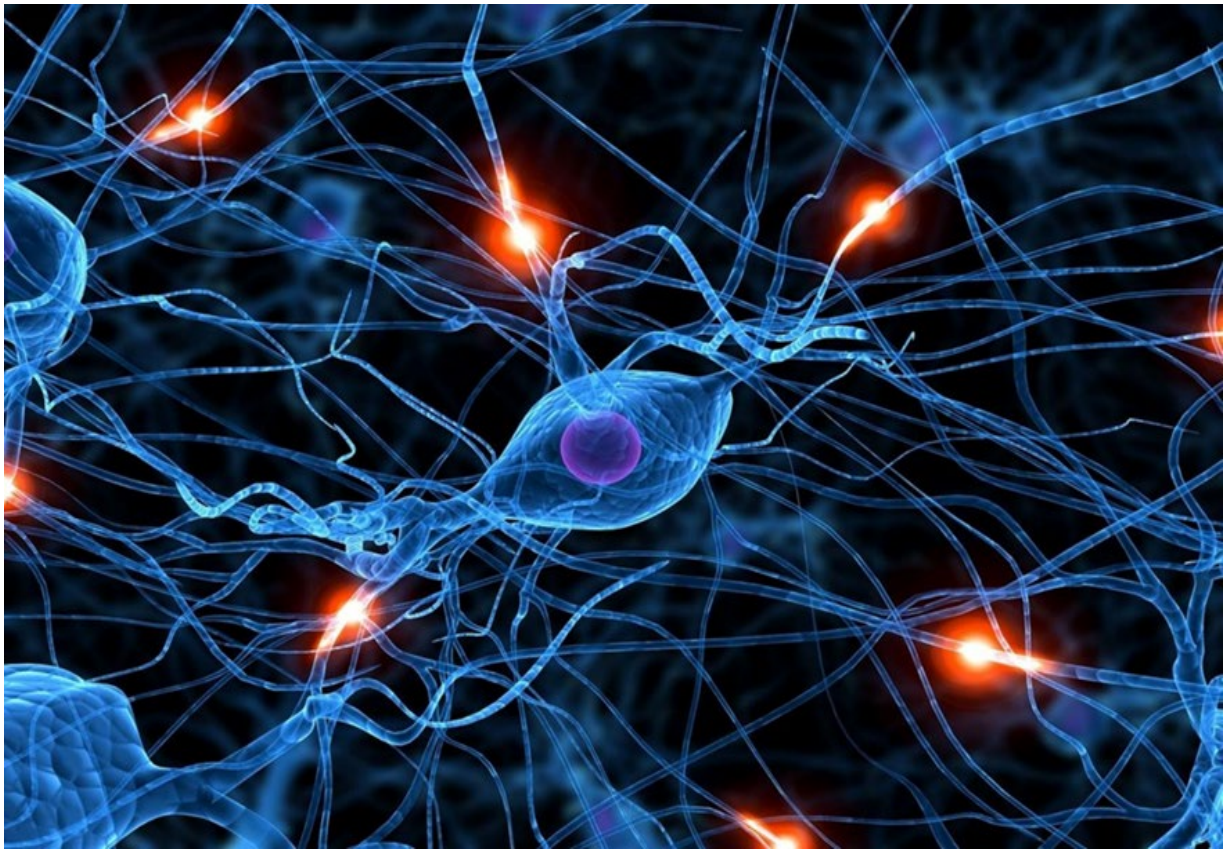
Study Guide – Block J

The undersigned subject heads, hereby approve the study guides for undergraduate MBBS students, having thoroughly reviewed and validated the content for accuracy, relevance, and alignment with the curriculum. We confirm that the study guides have undergone rigorous evaluation and have met the standards set by PMDC and our institution.

By signing below, we endorse these study guides as a valuable resource for our students, ensuring they receive comprehensive and high-quality educational materials to support their academic success.

Head of Department	**Name of Department**	**Signature**
Prof. Dr. Humaira Gulnaz (Chairperson curriculum committee)	Anatomy	
Prof. Dr. Aamir Shaukat	General Medicine	
Prof. Dr. Imtiaz Dogar	Psychiatry	
Prof.Dr. Nazir Hussain	Neurosurgery	
Prof. Dr. Rana Dawood Ahmad Khan	Orthopedics	
Prof. Dr. Attiya Anwar	Pharmacology	
Prof. Dr. Fakeha Rehman	Pathology	
Dr. Saadia Zafar	Pediatrics	
Dr. Noreen Maqbool Bokhari	Community Medicine	
Dr. Mubeen Inam Pal	Forensic Medicine	
Dr. Humaira Ahmad	Anesthesia	
Dr. Ayesha Ayub	HPERD	

MODULE-NEUROSCIENCES II



Module Committee

Chairperson Curriculum Committee	Prof. Dr. Humaira Gulnaz	Professor & Head of Anatomy Department	
Curriculum Coordinator	Dr. Ayesha Ayub	In-charge Health Professions Education & Research Department	
Block & Module Coordinator	Dr. Anam Azam Randhawa	Senior Demonstrator Community Medicine Department	
Academic Team Members			
All Departments Involved	**Focal Person Name**	**Designation And Sign**	**Sign**
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Pathology	Dr. Tahira Sattar	APWMO Pathology Department	
Forensic Medicine	Dr. Zuneera Misbah	APWMO Forensic Medicine Department	
Pharmacology	Dr. Akfish	Assistant Professor, Pharmacology Department	
Medicine	Dr. Zaheer Ahmad	Senior Registrar Medicine Department	
Pediatric Medicine	Dr. Sumaira Hassan	Senior Registrar Pediatric Medicine Department	
Anesthesia	Dr. Zunaira Ayesha	Senior Registrar Anesthesia Department	

Psychiatry	Dr Kaynat Riaz	PGR Psychiatry Department	
Neurosurgery	Dr Anum Wahab	Senior Registrar Neurosurgery Department	
Orthopedics	Dr. Tabish Saleem	Senior Registrar Orthopedic Surgery Department	
PRIME	Dr Sinha	SR Psychiatry	

Introduction of Module

The Neurosciences Module, designed for 4th year MBBS students at Faisalabad Medical University (FMU), represents a comprehensive educational program structured by the Health Professions Education & Research Department (HPERD). FMU envisions becoming a global leader in health sciences education and research, delivering efficient and compassionate healthcare. The curriculum aims to produce professional competence through innovation and learning, aligned with HPERD's mission of developing leaders in health professions education. The module is organized into key themes, including " Disturbed sleep, Disturbed Mood & Behavior Disturbed sleep, Disturbed mood & behavior, Right-sided weakness and inability to speak, Loss of consciousness and Fits, Tremors, Headache, Paraplegia and Numbness and tingling, " covering essential aspects of community medicine, pathology, pharmacology, medicine, psychiatry and forensic medicine over specific durations. Learning outcomes target a deep understanding of the subjects. The curriculum allocates time for each subject to ensure balanced education, with assessments designed to evaluate both theoretical knowledge and practical competencies. The comprehensive approach prepares students for advanced medical studies and professional practice, ensuring they are well-equipped to meet healthcare challenges.

Rationale

The Neurosciences Module aims to merge essential medical sciences with practical skills, preparing students for clinical practice complexities. It offers comprehensive education, covering crucial medical topics to ensure well-rounded professionals. The curriculum integrates theoretical knowledge with practical skills through assessments and exercises, focusing on both technical and softer skills like prescription writing. Critical thinking and problem-solving are emphasized, as students analyze medical conditions to develop appropriate interventions. This module provides a solid foundation for advanced medical studies, aligning with FMU's mission to promote professional competence and innovation, addressing local healthcare issues while integrating global knowledge.

Teaching Hours Allocation

Sr. No	Subject	Hours Needed
1	Pathology	17
2	Pharmacology	33
3	Forensic medicine	18
4	Community medicine	31
5	Medicine	11
6	Psychiatry	10
7	Pediatrics	3
8	Neurosurgery	2
9	Orthopedics	1
10	Anesthesia	4
11	Family medicine	1
12	PRIME	3
13	*Research	8**
	Total	134

** Two hours per week for research project in the whole academic session*

***These are NOT included in total hours as these are not used in developing assessment blueprints.*

List of Themes

Sr. No	Themes	Duration Days
1	Altered Consciousness	4
2	Disturbed mood & behavior	6
3	Right-sided weakness and inability to Speak	2
4	Loss of consciousness and Fits	5
5	Tremors	2
6	Headache	2
7	Motor Weakness/Paralysis	3
	Total	24

General Learning Objectives

By the end of Module,4th year MBBS students will be able to:

1. Describe anxiety disorders and their pharmacological management.
2. Explain the concepts of Mood disorders and their pharmacological management.
3. Explain psychotic disorders and their pharmacological management.
4. Describe the different types of epidemiological study designs and sampling techniques
5. Explain normal distribution curves, measures of central tendencies and distribution.
6. Define and explain key statistical terms and tests such as parametric and non-parametric and apply these for statistical data analysis.
7. Describe the pathophysiology and management of Dementias.
8. Elaborate the pathophysiology, clinical features, management, and prevention of cerebra vascular diseases.
9. Classify epilepsy and describe the pharmacological management of epilepsy in children and adults.
10. Describe the types and protocols of anesthesia and explain the drugs used as anesthetics.
11. Explain the pathology and clinical features of cerebellar diseases.
12. Elaborate the clinical features and pharmacological management of Parkinson`s disease, Motor neuron disease and Friedrich`s ataxia.
13. Describe the pathology and management of head injury.
14. Describe the pathogenesis, clinical features, and management of common CNS infections.
15. Classify brain, spinal cord, and peripheral nerves tumors, and describe their clinical features and management.
16. Explain the pathophysiology, clinical features, investigations and management of Multiple sclerosis, transverse myelitis, and Guillain Barre syndrome.
17. Classify peripheral neuropathies and elaborate their etiologies and clinical presentations.
18. Explain the clinical features and forensic approach to a patient with neurotoxic poisons.
19. Explain the forensic aspects of insanity and head injury.

Specific Learning Objectives

Theme-1 Altered Consciousness						
Sr. #	**Subject**	**Topic**	**Learning objectives**	**Teaching Strategies**	**Duration (Hour)**	**Assessment**
1	**Pharmacology**	Introduction to the Pharmacology of CNS	• Describe basic terms like neurotransmitters, neuromodulator/neurotropic factors, withdrawal symptoms (abstinence syndrome), cross-tolerance, reverse tolerance (sensitization) and cross-Dependence • Enlist the principal neurotransmitters and their receptors in the CNS • Describe voltage-gated, ligand-gated (ionotropic), ion channels and metabotropic receptors on the neuronal membrane	Interactive Lecture	1	MCQs
		Sedative-hypnotics (Benzodiazepines)	• Classify broadly the Sedative-Hypnotics • Classify and describe the pharmacokinetics, mechanism of action, pharmacological effects, clinical uses, drug interactions and adverse effects of Benzodiazepines • Describe the tolerance and dependence on Benzodiazepines • Name the antidote (competitive antagonist) to Benzodiazepines	Interactive Lecture	1	MCQ

		Barbiturates Buspirone Ramelteon	• Classify barbiturates • Describe the mechanism of action and clinical uses of barbiturates • Describe the difference regarding the mechanism of action of Barbiturates in comparison to Benzodiazepines • Describe mechanism of action and clinical uses of Buspirone and Ramelteon • Discuss the merits and demerits of Buspirone and Ramelteon in comparison to Benzodiazepines	Interactive Lecture	1	MCQ
		CNS stimulants Respiratory analeptics	• Classify CNS stimulants • Describe the mechanism of action, clinical uses and adverse effects of Respiratory analeptics • Describe the mechanism of action, clinical uses and adverse effects of Methyl Xanthine	SGD	2	MCQ
		Alcohols	• Describe alcoholism • Describe the pharmacokinetics, mechanism of action, pharmacological effects and clinical uses of Ethanol	Interactive Lecture	1	MCQs

			• Describe Disulfiram-like reaction with example of drugs causing it • Describe the management of Ethanol intoxication, Ethanol withdrawal symptoms • Describe briefly Methanol poisoning			
		Opioids	• Differentiate between Opioids and Opiates • Describe the term "narcotic" • Describe the source of Opium • Enlist the "brain's own Morphine" (endogenous Opioids) • Describe opioid receptor subtypes, their function and their endogenous peptide affinities. • Classify Opioids	Interactive Lecture	1	MCQs
		Opioids agonist and opioid with mixed receptor action	• Describe opioid agonist with features peculiar to specific agent (Phenanthrenes, phenylpiperidine, phenylheptylamines) • Enlist Opioids with partial agonist activity • Describe the	Interactive lecture	1	MCQs

			pharmacokinetics, mechanism of action, pharmacological effects, clinical uses, adverse effects and drug interaction • Describe the use of opioids as palliative care in terminal illness • Describe opioid rotation			
		The opioid antagonist & opioid dependence	• Enlist Opioids with antagonist activity • Describe the pharmacokinetics, mechanism of action, pharmacological effects, clinical uses, adverse effects and drug interaction • Role of naloxone in opioid toxicity, and other drug abuse • Describe the treatment of Opioid over dosage and dependence • Describe the mechanism of action and clinical use of Tramadol	Interactive lecture	1	MCQs
		Drugs of abuse	• Describe substance abuse, drug dependence, addiction	Interactive lecture	1	MCQ

			and habituation • Describe the Dopamine hypothesis of addiction • Enlist the non-addictive drugs of abuse • Describe "Club drugs" • Describe the drug treatment of Nicotine, Alcohol, Cannabis and Opioid abuse • Describe the drugs of abuse in sports with examples			
2	**Forensic Medicine**	Neurotoxins 1 (Morphine)	• Define and classify neurotoxins • Describe and enlist Somniferous poison. • Describe the mechanism of action, different signs, symptoms and autopsy appearance in a typical case of Morphine poisoning. • Describe fatal dose, treatment, diagnosis and medico-legal importance of Morphine poisoning.	Interactive Lecture	1	MCQs
		Neurotoxins 2 (Opium and Heroin)	• Describe the mechanism of action, different signs, symptoms and autopsy appearance in a typical case of Opium	Interactive Lecture	1	MCQs

			and Heroin poisoning. • Describe fatal dose, treatment, diagnosis and medico-legal importance of Opium and Heroin poisoning.			
		Inebriant Poisons (Alcohol)	• Describe and enlist Inebriant poison. • Describe mechanism of action, different signs, symptoms, and autopsy appearance in a typical case of Inebriant poisoning. • Describe fatal dose, treatment, and diagnosis and medico-legal importance for the Inebriant poisons.	Interactive Lecture	1	MCQs
		Sedative & Hypnotics (Barbiturates)	• Describe and enlist sedative and hypnotics • Describe mechanism of action, different sign, symptoms, and autopsy appearance in a typical case of Sedative and hypnotics. • Describe fatal dose, treatment, and diagnosis for the Sedative and hypnotics. • Describe medico-legal importance for the Sedative	Interactive Lecture	1	MCQs

			and hypnotics.			
		Stimulants and hallucinogens	• Describe and enlist stimulants and hallucinogens. • Describe mechanism of action, sign, symptoms and autopsy appearance in a typical case of stimulants and hallucinogens poisoning. • Describe fatal dose, treatment, and diagnosis and medico-legal importance of stimulants and hallucinogens.	Interactive Lecture	1	MCQs
		Drug Dependence	• Describe Drug dependence according to the WHO Criteria. • Discuss the various laws related to drugs.	Interactive Lecture	1	MCQ
3	**Community Medicine**	Epidemiology 1	• Define epidemiology • Explain the basic concepts of epidemiology • Explain Epidemiological Approaches • Discuss the uses and application of epidemiology	Interactive Lecture	1	MCQs
		Epidemiology 2	• Discuss role of epidemiologist in public health • Define epidemic and its types • Elaborate difference between epidemic and outbreak • Discuss the purposes and steps of epidemic	Interactive Lecture	1	MCQs

			investigating. • Define Surveillance and explain its types for epidemic detection			
		Epidemiology 3	• Discuss the epidemiological tools of measurement • Calculate Rate, ratio and proportion • Elaborate the concept of Three basic components of Epidemiology • Explain and discuss calculation of basic measurements in Epidemiology regarding disease occurrence ○ Incidence rates ○ Prevalence rates ○ Affects (disability rates) ○ Severity (fatality rates & mortality rates) ○ Survival (survival rates)	Interactive Lecture	1	MCQs+OSPE
		Study designs 1 (Descriptive Studies)	• Classify epidemiological study designs • Elaborate descriptive study designs • Discuss application of descriptive study designs • Develop scenarios for application of descriptive studies in medical field	Interactive Lecture	1	MCQ

		Study designs 2 (Cohort)	• Define and classify analytical study designs • Define and explain cohort and case-control studies • Explain Steps and application of Cohort and case-control studies • Discuss scenarios for application of cohort and case-control studies in medical filed	Interactive Lecture	1	MCQs
		Study designs 3 (Case-Control)	• Define and explain case-control studies • Explain steps and application of case-control studies • Discuss scenarios for application of case-control studies in medical filed	Interactive Lecture	1	MCQs
		Study designs 4 (Experimental Studies)	• Define and classify experimental study designs • Explain the steps and applications of experimental study designs • Discuss scenarios for application RCTS and community trials • Elaborate the differences between RCTS and Qazi-Experimental studies	Interactive Lecture	1	MCQs
		Measures of Morbidity and Mortality and Screening	• Calculate the measures of morbidity and mortality • Define screening and describe its types. • Explain Wilson's criteria for screening • Explain Sensitivity and specificity and predictive values of a screening test	SGD	2	MCQs+OSPE

			• Calculate Sensitivity, specificity and predictive values of a screening test • Calculate and interpret the Yield of a screening test • Discuss screening bias in different scenarios			

Theme-2 Disturbed Mood & Behavior						
Sr. #	**Subject**	**Topic**	**Learning objectives**	**Teaching Strategies**	**Duration (Hour)**	**Assessment**
1	**Psychiatry**	Classification and Psychopathology	• Understand classification systems (ICD, DSM) • Define common psychopathological terms	Interactive Lecture	1	MCQs
		Sleep-wake cycle disorders and eating disorders	• Discuss classification, clinical features, and management strategies for sleep wake cycle disorders and eating disorders.	Interactive Lecture	1	MCQs
		Dementia and Delirium	• Recognize symptoms, diagnostic criteria, differential diagnosis, and management principles of Dementia and Delirium	Interactive Lecture	1	MCQs
		Schizophrenia and other psychotic disorders	• Recognize symptoms, diagnostic criteria, and management principles of Schizophrenia and other psychotic disorders	Interactive Lecture	1	MCQs
		Mood disorders	• Classify depression and bipolar disorder, outline diagnosis and management	Interactive Lecture	1	MCQs

			of Mood disorders			
		OCD and Conversion disorders	• Describe features, differential diagnosis, and treatment approaches of OCD and Conversion disorders	Interactive Lecture	1	MCQs
		Substance use disorders	• Identify common substances, clinical features, complications and treatment of substance use disorders	Interactive Lecture	1	MCQs
		Personality disorders, Suicide & deliberate self-harm	• Explain types, diagnostic features and general management of Personality disorders • Define, risk factors, prevention, and management of Suicide and deliberate self-harm.	Interactive Lecture	1	MCQs
		Physical treatments and non-pharmacological interventions	• Describe ECT, rTMS, psychotherapy, and other non-drug treatments	Interactive Lecture	1	MCQs

2	**General Medicine**	Alzheimer`s disease and Dementias	• Explain the pathophysiology, clinical features and management of Alzheimer`s disease • Describe the reversible and irreversible causes of Dementia	Interactive Lecture	1	MCQs
3	**Pharmacology**	Antidepressants (SSRIs & SNRI)	• Describe the Monoamine hypothesis of depression • Classify antidepressants • Describe the pharmacokinetics, mechanism of action, clinical uses, adverse effects and drug interactions of SSRIs and SNRI	Interactive Lecture	1	MCQs
		TCAs (Tricyclic Antidepressants)	• Enlist TCAs • Describe the mechanism of action, clinical uses, adverse effects and drug interactions of TCAs	Interactive Lecture	1	MCQs
		MAOIs (Monoamine Oxidase Inhibitors)	• Enlist MAOIs • Describe the pharmacokinetics mechanism of action, clinical use, adverse effects and drug interactions of MAOIs • Describe Serotonin syndrome • Describe Hypertensive	SGD	2	MCQs

			Cheese reaction • Describe the procedure of switching-over from one category of antidepressants to another one • Describe "Augmentation" of antidepressant therapy • Describe the atypical drugs (atomoxetine, maprotiline, bupropion) used for treatment of depression			
		Antipsychotics (Anti-schizophrenic drugs)	• Describe the Dopamine hypothesis of Schizophrenia • Classify Antipsychotics • Describe the advantages of atypical antipsychotics over the Typical (Classical/Traditional/Old) agents • Describe the mechanism of action, pharmacological effects, clinical uses, drug interactions and adverse effects of Antipsychotics • Explain the drug treatment of extrapyramidal syndrome	Interactive Lecture	1	MCQs
		Mood-stabilizing drugs	• Describe the concept of "mood-stabilization" in	Interactive Lecture	1	MCQs

			Bipolar affective disorder (Manic Depressive illness) • Enlist Mood-stabilizing drugs • Discuss the role of valproic acid and carbamazepine in bipolar affective disorder • Describe the pharmacokinetics, mechanism of action, clinical uses, adverse effects and drug interactions of Lithium Carbonate			
4	**Forensic medicine**	Insanity and relationship to criminal charges	• Discuss general presumptions and exceptions in law in relation to insanity • Describe different verdicts of plea of insanity	Interactive Lecture	1	MCQs
		Forensic Psychiatry	• Define and describe Forensic • Psychiatry. • Describe different terms used in Forensic Psychiatry: ○ Delirium ○ Delusion ○ Hallucination ○ Illusion	Interactive Lecture	1	MCQs

			○ Lucid Interval ○ Neurosis ○ Psychopath ○ Psychosis			
		Mental health act	• Describe procedure of admission and discharge of mentally ill patient based on mental health act • Describe procedure of handling a wandering lunatic	Interactive Lecture	1	MCQs
		Will (Civil and criminal responsibility of mentally ill patients)	• Define testamentary capacity • Enlist conditions required for a valid Will • Describe the role of a doctor in taking a Will from a sick person • Explain the concept of civil and criminal responsibility of mentally ill patients	Interactive Lecture	1	MCQs
5	**Community medicine**	Mental health 1	• Define mental health • Describe classification of mental health illnesses • Discuss global perspectives and epidemiology of mental health disorders	Interactive Lecture	1	MCQs
		Mental health 2	• Discuss risk factors leading to mental health problems in community • Explain warning signs of	Interactive Lecture	1	MCQs

			mental illnesses • Discuss prevention and control of mental health disorders • Describe the different mental health services			
		Mental Health 3	• Define and explain drug addiction and drug dependence • Enlist commonly used drugs of dependence • Explain clinical presentation of drug dependence vs addiction. • Discuss harmful effects of drug dependence and addiction • Explain preventive and control measures	Interactive Lecture	1	MCQs
		Introduction to Biostatistics (Data and variables)	• Describe the significance of biostatistics in health and epidemiology • Define, classify and explain types of data. • Define, classify and explain different variables	Interactive Lecture	1	MCQs
		Sampling	• Define sampling. • Elaborate the types of probability and non-probability sampling. • Demonstrate and employ	SGD	2	MCQs+OSPE

			sampling techniques in different scenarios.			
		Biases in epidemiological studies	• Define Bias • Discuss different types of biases • Discuss how bias can be prevented under different scenarios	Interactive Lecture	1	MCQs
6	**PRIME**	Dealing with patients	• Demonstrate the ability to deal with difficult patients such as psychiatrics and aggressive.	Group discussion /Role play	1hr	Continuous Formative + MCQs
		Conflict resolution	• Explain the pre-requisites for conflict resolution as a leader • Show the ability to solve problems regarding difficult patients/attendants	Group discussion /Role play		Continuous Formative + MCQs

Skill Lab

Sr.#	Subject	Topic	Learning objectives	Duration (Hours)	Teaching Strategy	Assessment
1	**Forensic Medicine**	Will	• Taking Testamentary capacity	2	Practical work	OSPE

Theme-3 Right-sided weakness and inability to speak						
Sr.#	**Subject**	**Topic**	**Learning objectives**	**Teaching Strategies**	**Duration (Hour)**	**Assessment**
1	**Pathology**	Hypoxia, ischemia, and infarction Intracranial hemorrhage	• Define hypoxia, ischemia, and infarction, and describe its morphology and consequences in the context of CNS involvement • Describe the etiology, risk factors and morphology of intracranial hemorrhage	SGD	2	MCQs
		Strokes & Subarachnoid hemorrhage (SAH)	• Describe the etiology, risk factors, morphology, and histological features of strokes • Explain the etiology, risk factors, morphology and histological features of SAH	Interactive Lecture	1	MCQs
2	**General Medicine**	Stroke	• Explain the types of strokes • Describe the clinical features, radiological features, and	Interactive Lecture	1	MCQs

			management of a patient with intracerebral bleed • Describe the clinical features, radiological features, and management of a patient with stroke due to an infarction			
3	**Community Medicine**	Non-communicable diseases: Strokes	• Discuss the epidemiological determinants of stroke in community • Discuss the prevention and rehabilitation of strokes	Interactive Lecture	1	MCQ
		Measures of Central tendency & dispersion	• Classify measures of central tendency & dispersion • Calculate measures of central Tendency & dispersion • Interpret and signify the results • Describe the advantages and disadvantages of different measures • Explain the use of different measures in specific circumstances	SGD	2	MCQ+OSPE
		Normal distribution	• Define and describe normal distribution • Calculate and graphically represent normal distribution • Explain its use & significance in relation to data • Calculate and depict	Interactive Lecture	1	MCQ+OSPE

			percentile and interquartile range • Explain use and significance of these in different situations			
		Confidence Interval and types of errors	• Describe and calculate confidence level and interval • Explain their use and significance in different situations • Explain and calculate P value, critical region, rejection region, α β errors • Describe their use and significance in different situations	Interactive Lecture	1	MCQ+OSPE
4	**Neurosurgery**	Stroke and Subarachnoid hemorrhage	• Describe the neurosurgical management of stroke and Subarachnoid hemorrhage	Interactive Lecture	1	MCQs
5	**Forensic Medicine**	Head Injury	• Describe head injury in relation to scalp and skull injuries. • Classify different varieties of skull fractures • Explain commonest site of skull fracture. • Describe mechanism of cerebral injury including coup and counter coup mechanism.	Interactive Lecture	1	MCQ

			• Describe intracranial hemorrhages and their types in detail as per medicolegal point of view. • Describe the medicolegal aspects of Punch-drunk syndrome			
6	**PRIME**	Emotional Intelligence	• Describe & display appropriate emotional and social intelligence	Group discussion /Role play	1hr	Formative + MCQs

Skill Lab

Sr. #	Subject	Topic	Learning objectives	Duration (Hours)	Teaching Strategy	Assessment
1	**Community medicine**	Data presentation & Interpretation of statistical Data	• Identify and interpret the different data presentation charts • Interpret the normal distribution curve, skewed distribution, bi and poly-modal distribution and standard normal curves. • Construct various shapes of frequency distribution	2	Practical work	OSPE

Theme-4 Loss of consciousness and fits						
Sr.#	**Subject**	**Topic**	**Learning objectives**	**Teaching Strategies**	**Duration (Hour)**	**Assessment**
1	**General Medicine**	Seizures	• Define seizures • Differentiate between a seizure and syncope • Classify epilepsy • Explain the pathophysiology, clinical features, risk factors, investigations and treatment of ○ Tonic-Clonic epilepsy ○ Absence seizures ○ psychomotor epilepsy • Explain the management of a patient with status epilepticus	Interactive Lecture	1	MCQs
		Meningitis	• Explain the etiology, pathogenesis, clinical presentation, investigations and management of ○ Acute pyogenic meningitis ○ Tuberculous meningitis	Interactive Lecture	1	MCQs
2	**Pediatric Medicine**	Meningitis /TBM	• Explain the etiology, pathogenesis, clinical presentation, investigations and management of ○ Acute pyogenic meningitis ○ Tuberculous meningitis in children and Neonates	Interactive Lecture	1	MCQs
3	**Pathology**	Infections of the CNS	• Explain the etiology, morphology and histological features of ○ Acute pyogenic meningitis	SGD	2	MCQs

			○ Viral encephalitis ○ Brain abscess • Cerebral Toxoplasmosis			
4	**Anesthesia**	Introduction to Anesthesia and monitoring of patients during Anesthesia	• Define anesthesia • Describe different types of anesthesia • Discuss importance of anesthesia • Illustrate future of anesthesia • Describe standards of monitoring during anesthesia (ASA guidelines) • Explain non-invasive and invasive monitoring	Interactive Lecture	1	MCQs
		Pre-operative Anesthesia evaluation and risk assessment	• Define importance of pre-operative evaluation • Describe the steps of history taking in pre-operative evaluation. • Discuss ASA classification. • Formulation of anesthesia plan, ensuring patient safety.	Interactive Lecture	1	MCQs
		General anesthesia	• Define General anesthesia • Discuss different airway devices. • Describe the inhalational and intravenous agents • Describe the methods of induction of general anesthesia • Explain DAS guidelines • Outlines benefits of General Anesthesia • Enlist complications of anesthesia at induction, intraoperatively and post operatively	Interactive Lecture	1	MCQs
		Regional Anesthesia and Neuroaxis blocks	• Explain types of regional anesthesia ○ Spinal block ○ Epidural block ○ Caudal block ○ Combined spinal/ Epidural	Interactive Lecture	1	MCQs

			• Discuss indications and limitations • Describe following terms ○ Nerve block ○ Single shot ○ Continuous infusion ○ Local infiltration			
5	**Pharmacology**	Anti-seizure drugs (Anti-epileptics)	• Classify anti-seizure drugs according to their spectrum of activity. • Enlist the "Broad-spectrum" anti-epileptics (Valproate and Lamotrigine) • Describe the mechanism of action, clinical uses and adverse effects of Lamotrigine and Topiramate	Interactive lecture	1	MCQs
		Drugs for treatment of partial seizures	• Describe the mechanism of action, clinical uses, adverse effects and drug interactions of ○ Carbamazepine ○ Phenytoin ○ Gabapentin ○ Pregabalin • Describe the pharmacokinetics of Phenytoin with reference to the phenomenon of zero-order kinetics	Interactive lecture	1	MCQs
		Drugs for treatment of generalized seizures	• Describe the mechanism of action, clinical uses, adverse effects and drug interactions of ○ Valproate	Interactive lecture	1	MCQs

			○ Ethosuximide • Describe briefly the historic role of phenobarbitone in the management of epilepsy • Name the benzodiazepines used in the management of epilepsy			
		Antiepileptics during pregnancy and status epilepticus	• Describe the use of antiepileptics during pregnancy • Describe drug interaction of antiepileptics with oral contraceptive pills • Describe the management of status epilepticus	SGD	2	MCQs
		General anesthetics	• Describe the stages of general anesthesia • Describe balanced anesthesia • Describe the putative targets of general anesthetic action.	Interactive Lecture	1	MCQs
		Inhaled anesthetics	• Describe the pharmacokinetics, mechanism of action, pharmacological effects and adverse effects of Inhaled anesthetics • Discuss the clinical significance of Blood: Gas partition coefficient of Inhaled anesthetics • Define MAC_{50} (minimum Alveolar Concentration- 50%) and describe its significance • Describe second gas effect and diffusion hypoxia • Describe Malignant hyperthermia and its management • Describe the properties of an ideal inhaled anesthetic	Interactive Lecture	1	MCQs
		IV anesthetics	• Describe the mechanism of action, clinical use and adverse effects of Intravenous anesthetics	Interactive lecture	1	MCQs

			• Describe re-distribution of Thiopentone • Define neuroleptanalgesia and neurolept anesthesia • Describe TIVA (Total Intravenous Anesthesia) technique			
		Dissociative anesthesia and Obstetric analgesia	• Describe dissociative anesthesia • Name the anesthetic agent that causes dissociative anesthesia • Describe Pre-anesthetic medications • Describe the drugs for obstetric analgesia	SGD	2	MCQs
6	**Forensic medicine**	Deliriant Poisons - Dhatura	• Describe and enlist Deliriant poisons. • Describe mechanism of action different signs, symptoms and autopsy appearance in a typical case of Dhatura poisoning. • Describe fatal dose, treatment, diagnosis and medico-legal importance of Dhatura poisoning.	Interactive Lecture	1	MCQs
		Deliriant poisons - Cannabis indica	• Describe mechanism of action of the Cannabis indica. • Describe different sign, symptoms and autopsy appearance in a typical case of Cannabis indica poisoning. • Describe fatal dose, treatment, diagnosis and medico-legal importance of Cannabis indica poisoning.	Interactive Lecture	1	MCQs
7	**Family Medicine**	Rabies	• Explain the etiology, clinical presentation of a patient with Rabies • Describe the types of wounds	Interactive Lecture	1	MCQs

			inflicted by rabid dog bite • Explain the types of active and passive immunization for Rabies post-exposure prophylaxis • Describe the indications of Rabies vaccine and immunoglobulins			
8	**Community Medicine**	Z test	• Explain and calculate 'z' score and test • Describe use of z score in different statistical settings • Calculate 'z' test for a set of data and explain its application in hypothesis testing	Interactive Lecture	1	MCQs
		Parametric and non-parametric tests	• Describe the different types of parametric tests • Describe the different types of non-parametric tests • Explain the application of parametric and non-parametric tests.	Interactive Lecture	1	MCQs

Skill Lab

Sr. #	Subject	Topic	Learning objectives	Duration (Hours)	Teaching Strategy	Assessment
1	**Pathology**	CSF	• Describe the chemical, cytological • composition of CSF • Estimate the following analysis of CSF: Chemistry Cytology Gram stain Microbiology	2	Practical work	OSPE

Theme-5 Tremors						
Sr. #	**Subject**	**Topic**	**Learning objectives**	**Teaching Strategies**	**Duration (Hour)**	**Assessment**
1	**Pathology**	Neurodegenerative disorders: Alzheimer`s disease Parkinson`s disease	• Describe the etiology, risk factors, morphology and histological features of Alzheimer`s disease • Describe the etiology, risk factors, morphology and histological features of Parkinson`s disease	Interactive Lecture	1	MCQs
		Huntington's Disease and Spinocerebellar ataxias	• Describe the etiology, risk factors, morphology and histological features of o Huntington`s disease o Spinocerebellar ataxias	SGD	2	MCQs
2	**Pharmacology**	Drugs for Parkinsonism (levodopa, Carbidopa)	• Classify drugs for Parkinsonism • Describe the pharmacokinetics, mechanism of action, adverse effects, contraindications and drug interactions of Levodopa • Discuss the rationale of combining Carbidopa with	Interactive Lecture	1	MCQs

			Levodopa • Describe the on-off phenomenon, end-of-dose, Akinesia and "drug holidays" for Levodopa • Describe the mechanism of action and clinical use of Apomorphine			
		Bromocriptine, Selegiline	• Describe the mechanism of action, clinical uses and adverse effects of o Bromocriptine o Selegiline • Describe the differentiating point regarding the use of Selegiline as antiparkinsonian drug and its use as an antidepressant drug	Interactive lecture	1	MCQs
		Drug-induced Parkinsonism	• Enlist the drugs causing Parkinsonism-like symptoms • Enlist the drugs used in the management of drug-induced Parkinsonism • Describe the rationale of avoiding Levodopa in drug- induced Parkinsonism	Interactive lecture	1	MCQs
3	**Pediatrics**	Cerebellar ataxias / Friedreich's Ataxia	• Describe the clinical features and management of Friedreich's Ataxia	Interactive Lecture	1	MCQs
4	**Community Medicine**	"t" test & Chi square test	• Describe and calculate 't' test • Explain uses and	Interactive lecture	1	MCQs

			application of different types of T-tests • Calculate degree of freedom • Calculate 'x^{2}' test • Explain its use in different statistical settings and in hypothesis testing			
		Correlation & Regression	• Calculate Correlation & Regression • Interpret and apply to statistical settings	Interactive lecture	1	MCQs

Theme-6 Headache						
Sr.#	**Subject**	**Topic**	**Learning objectives**	**Teaching Strategies**	**Duration (Hour)**	**Assessment**
1	**Pathology**	Tumors of CNS	• Describe classification of brain tumors based on ○ primary and secondary origin ○ benign and malignant • Describe the classification, gross and microscopic morphologic features of ○ Gliomas ○ Embryonal neoplasms of brain ○ Meningioma. • Enlist brain neoplasms other than gliomas, meningioma and embryonal cell neoplasms • Enlist the metastatic brain neoplasms	SGD	2	MCQs
2	**Pharmacology**	Drugs for Migraine and Cluster headaches	• Classify drugs used for the treatment and prophylaxis of Migraine and Cluster headaches • Describe the mechanism of action, clinical use and	Interactive Lecture	1	MCQ

			adverse effects of Sumatriptan • Enlist Ergot alkaloids • Describe the mechanism of action, clinical use, pharmacological effects and adverse effects of Ergot alkaloids • Enlist the drugs used for acute attack of migraine			
4	**Community Medicine**	Practical Problems in biostatistics	• Identify possible practical problems encountered in the application of biostatistics. • Discuss solutions to these problems	Interactive lecture	1	MCQs
		SPSS	• Construct data for demographic variables • Use SPSS for data analysis	SGD	2	Formative assessment
		Referencing	• Use Endnote for reference Management • Explain how to Compile, analyze and write a dissertation	Interactive lecture	1	Formative assessment
5	**Psychiatry**	Forensic and Child Psychiatry	• Highlight basics of child psychiatry and forensic aspects of psychiatry	Interactive Lecture	1	MCQs

Skill Lab

Sr. #	Subject	Topic	Learning objectives	Duration (Hours)	Teaching Strategy	Assessment
1	**Pathology**	Histopathological specimens of brain tumors	• Identify the gross structure and microscopic features of: Meningioma Glioma/Astrocytoma	2	Practical work	OSPE
2	**Pharmacology**	Prescription Formulation	• Formulate a prescription for a patient with o Newly diagnosed depression o Tonic-Clonic and Petit-mal epilepsy o Migraine headache	2	Practical Work	OSPE

Theme-7 Motor Weakness & Paralysis						
Sr.#	**Subject**	**Topic**	**Learning objectives**	**Teaching Strategies**	**Duration (Hour)**	**Assessment**
1	**Pathology**	Multiple sclerosis and other demyelinating disorders of CNS	• Explain the pathogenesis, morphology and histological features of multiple sclerosis • Describe the morphology of ○ Acute demyelinating encephalomyelitis ○ Acute necrotizing hemorrhagic encephalitis	Interactive Lecture	1	MCQs
		Peripheral nerve injury & demyelinating neuropathies	• Describe the patterns and types of neuronal injury • Describe the pathophysiology and morphological features of Guillain Barre Syndrome • Explain the pathophysiology of Chronic demyelinating polyneuropathies	Interactive Lecture	1	MCQs
		Myasthenia Gravis & Tumors of Peripheral nerve	• Describe the pathophysiology and morphology of Myasthenia Gravis • Enlist the tumors of peripheral Nerves • Describe the etiology, morphology and histological	Interactive Lecture	1	MCQs

			features of ○ Schwannoma ○ neurofibromatosis			
2	**Forensic Medicine**	Neurotoxins Nux vomica	• Describe and enlist spinal poison. • Describe mechanism of action for the spinal poison. • Describe different signs, symptoms and autopsy appearance in a typical case of spinal poisoning. • Describe fatal dose, treatment, diagnosis and medico-legal importance for spinal poisoning.	Interactive Lecture	1	MCQs
3	**General Medicine**	Motor Neuron Disease	• Describe the etiology, risk factors and clinical features of Motor Neuron Disease • Describe the types, clinical presentation and management of Motor neuron disease	Interactive Lecture	1	MCQ
		Multiple sclerosis	• Explain the pathophysiology, clinical features and management of Multiple sclerosis	Interactive Lecture	1	MCQs
		Transverse myelitis	• Describe the etiology, pathophysiology, clinical features and management of Transverse myelitis	Interactive Lecture	1	MCQ

		Caries spine	• Explain the pathophysiology, clinical features, investigations and management of Caries spine	Interactive Lecture	1	MCQ
		Guillain Barre syndrome	• Explain the pathophysiology, clinical features and management of Guillain Barre syndrome	Interactive Lecture	1	MCQ
		Neuropathies	• Describe the causes, types, distribution and clinical features of different neuropathies	Interactive Lecture	1	MCQ
		MG	• Explain the pathophysiology, clinical features and management of Myasthenia Gravis	Interactive Lecture	1	MCQ
4	**Pharmacology**	Local anesthetics (Lignocaine and others)	• Classify the Local anesthetics used for ○ surface anesthesia ○ infiltration anesthesia ○ nerve block ○ spinal anesthesia ○ epidural anesthesia • Describe EMLA (Eutectic Mixture of Local Anesthetics) and its clinical use • Describe the pharmacokinetics, mechanism of action, pharmacological effects,	Interactive Lecture	1	MCQs

			adverse effects and clinical uses of Local anesthetics • Describe the major advantages of adding Adrenaline to Lignocaine for infiltration anesthesia • Calculate the quantity of Adrenaline/ml in the traditionally used combinations of Adrenaline and Lignocaine			
5	**Orthopedics**	Peripheral nerve injury & Traumatic paraplegia	• Describe the types and management of peripheral nerve injury • Explain entrapment neuropathies • Describe the risk factors, clinical features and management of Carpal tunnel syndrome • Describe the general management of a patient with traumatic paraplegia	Interactive Lecture	1	MCQs
6	**Neurosurgery**	Spinal cord tumors	• Describe the types, clinical features and surgical management of spinal cord Tumors	Interactive Lecture	1	MCQs
7	**Pediatrics**	Hereditary neuropathies	• Describe the types of hereditary neuropathies • Discuss the clinical features of hereditary neuropathies	Interactive Lecture	1	MCQs

			• Describe the management of hereditary neuropathies			

Skill Lab

Sr. #	Subject	Topic	Learning objectives	Duration (Hours)	Teaching Strategy	Assessment
1	**Forensic Medicine**	Inebriant, spinal, deliriant and Sedative poisons	• Recognition of • Opium • Heroin • Dhatura • Cannabis indica • Nux vomica • Examination of a case of Alcohol poisoning	2	Practical work	OSPE

Assessment Plan – 4th Year MBBS

The 4th Year will be assessed in 5 blocks.

1. **Block-J** (Neurosciences-II module) will be assessed in paper-J.
2. **Block-K** (GIT and Hepatobiliary-II modules) will be assessed in paper-K.
3. **Block-L** (Renal-II, Endocrine and reproduction modules) will be assessed in paper-L.
4. **Block-M-1** (ENT module) will be assessed in paper M-1.
5. **Block-M-2** (Eye module) will be assessed in paper M-2.
6. Each **written paper** consists of 120 MCQs except for ENT and Eye papers which include 90 MCQs each.
7. **Internal assessment** will be added to final marks in FMU as shown in the table below.
8. In **OSPE** For ENT (M-1 module) and Eye (M-2 module), the marks allocated for each OSCE station will be 5, while the rest of the modules are allotted 6 marks per OSCE station.
9. Practical assessment will be in the form of OSPE/OSCE which will also include embedded viva stations.

Internal Assessment Pattern

Theory		
Sr. No	**Criteria**	**Numbers**
1	Attendance (>90%=3,80-89%=2,70-79%=1,<70%=0)	3
2	Creative work/assignments/Task	2
3	Continuous Assessment throughout block (Formative assessments, Viva Voce, departmental activities)	2
4	Block examination theory	3
5	Pre prof Examination of block	4
Total		**14**

OSPE		
Sr. No	**Criteria**	**Numbers**
1	Attendance (>90%=3,80-89%=2,70-79%=1,<70%=0)	3
2	Log Book/practical copy	4
3	Discipline, Responsibility and team work	1
4	Block examination OSPE	2
Total		**10**

Paper-J (Neurosciences-II)	
MCQs	
Subject	**Total MCQs**
Pharmacology	20
Pathology	22
Forensic medicine	18
Community medicine	27
PRIME	2
Medicine	11
Psychiatry	9
Neurosurgery	2
Paediatrics	5
Anaesthesia	3
Family medicine	1
Total	**120**

Table-2: OSPE/OSCE

Subject	Viva stations	Total OSPE/OSCE stations	Total stations
Pharmacology	2	3	5
Pathology	2	2	4
Forensic medicine	2	2	4
Community medicine	2	3	5
Medicine Allied (Neurology/Psychiatry)	X	1	1
Medicine Allied (Gastroenterology/Dermatology)	x	1	1
Total	**8**	**12**	**20**

Learning Resources

S#	Subjects	Resources
1.	Pathology	1. Robbins & Cotran, Pathologic Basis of Disease,9 th edition. Rapid Review Pathology,4 th edition by Edward F. Goljan MD
2.	Community Medicine	1. Preventive and Social Medicine by K Park 2. Community Medicine by M. llyas 3. Basic Statistics for the Health Sciences by Jan W Kuzma Textbook of Community Medicine and Public Health, 2018. Saira Afzal, Sabeena Jala
3.	Pharmacology	1. Lippincot Illustrated Pharmacology Basic and Clinical Pharmacology by Katzung
4.	Psychiatry	1. Oxford textbook of psychiatry by Michael G. Gelder, 2nd Edition 2. Handbook of Behavioral Sciences, by Mowadat H. Rana 3. Drugs used in Psychiatry, by Prof. Muhammad Iqbal Afridi Kaplan Series, Behavioral Sciences, Psychiatry
5.	Medicine	1. Davidson's Principles and Practice of Medicine 2.Kumar and Clark's Clinical Medicine, Edited by Parveen Kumar, 9th Edition
6.	Pediatrics	1.Nelson Textbook of Pediatrics, 19th Edition 2.Textbook of Pediatrics by PPA, preface written by S. M. Haneef Clinical Pediatrics by Lakshmana swamy Aruchamy, 3rd Edition
7,	Neurosurgery	1.Bailey & Love's Short Practice of Surgery, 26th Edition 2.Essential Surgical practice by Alfred cushaieri B hanna 5th edition
8.	Forensic medicine	1.Principles and rectus of forensic medicine 2nd edition by Naseeb R Awan 2.Textbook of medical jurisprudence by Parekh 8th edition
9.	Anesthesia	1.Morgan and Mikhail's Clinical Anesthesiology, Seventh Edition 2. Clinical Anesthesia by Barash, Cullen, and Stoelting
10.	Ortho	1.Essential Orthopaedics by J. Maheshwari and Mhaskar 2. Turek's Orthopaedics Principles and Their Applications by Anil K. Jain