

Learning objectives
Neurosciences-2 Module
Year-4 (MBBS)
Total Weeks- 8
Central Curriculum Committee, Khyber Medical University

Themes

S. No	Theme	Topics / region covered	Duration in days
1	Disturbed sleep	Psychiatry: Anxiety disorders	5
2	Disturbed mood & behavior	Psychiatry: Depression and Psychosis	5
3	Right-sided weakness and inability to speak	Cerebral cortex and stroke syndrome	3
4	Loss of consciousness and Fits	Anaesthesia and Epilepsy	5
5	Tremors	Cerebellum and Extrapyramidal system	2
6	Headache	CNS infections, head injury, hydrocephalus, and tumors	5
7	Paraplegia	Spinal Cord	2
8	Numbness and tingling	Peripheral nerves	3
9	Psychomotor skills	Practical work	

General learning outcomes

At the end of this module, the year 4 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 pathophysiology and management of Dementias
- 5) Elaborate the pathophysiology, clinical features, management, and prevention of cerebrovascular diseases
- 6) Classify epilepsy and describe the pharmacological management of epilepsy in children and adults
- 7) Describe the types and protocols of anaesthesia and explain the drugs used as anaesthetics
- 8) Explain the pathology and clinical features of cerebellar diseases
- 9) Elaborate the clinical features and pharmacological management of Parkinson's disease
- 10) Explain the clinical features and management of Motor neuron disease and Friedrich's ataxia
- 11) Describe the pathology and management of head injury
- 12) Describe the pathogenesis, clinical features, and management of common CNS infections
- 13) Classify brain, spinal cord and peripheral nerves tumors, and describe their clinical features and management
- 14) Explain the pathophysiology, clinical features, investigations and management of Multiple sclerosis, transverse myelitis and Guillain Barre syndrome
- 15) Classify peripheral neuropathies and elaborate their etiologies and clinical presentations
- 16) Explain the clinical features and forensic approach to a patient with neurotoxic poisons.
- 17) Explain the forensic aspects of insanity and head injury.

Specific Learning Objectives

Subject	Topic	S. N o	Learning Objectives <i>At the end of this module, the students of year 4 MBBS will be able to:</i>
Theme-1: Disturbed sleep			
Psychiatry	Sleep disorders	1	Describe the types of sleep disorders
		2	Explain the pharmacological and non-pharmacological management of sleep disorders
		3	Describe the ways of improving healthy sleep
	Non-organic insomnia	4	Define non-organic insomnia
		5	Explain the management of non-organic insomnia
	Sleep wake cycle disorders	6	Describe the concept of sleep-wake cycle disorder
		7	Describe the pharmacological and non-pharmacological management of sleep-

			wake wake cycle disorder
Pharmacology	Introduction to the Pharmacology of CNS	8	Describe basic terms like neurotransmitters, neuromodulator/neurotropic factors, withdrawal symptoms (abstinence syndrome), cross-tolerance, reverse tolerance (sensitization) and cross-dependence
		9	Describe the blood-brain barrier and its clinical significance
		10	Enlist the principal neurotransmitters and their receptors in the CNS
		11	Describe voltage-gated, ligand-gated (ionotropic), ion channels and metabotropic receptors on the neuronal membrane
		12	Classify the drugs acting on the CNS

	Sedative-hypnotics (Minor tranquilizers)	13	Classify broadly the Sedative-Hypnotics
	Benzodiazepines	14	Classify Benzodiazepines
		15	Describe the pharmacokinetics of Benzodiazepines
		16	Describe the mechanism of action of Benzodiazepines
		17	Describe the pharmacological effects of Benzodiazepines
		18	Describe the clinical uses of Benzodiazepines
		19	Describe the adverse effects of Benzodiazepines
		20	Describe the tolerance and dependence on Benzodiazepines
		21	Describe the drug interactions of Benzodiazepines
		22	Name the antidote (competitive antagonist) to Benzodiazepines

		23	Enlist the inverse agonists to Benzodiazepines
	Barbiturates	24	Classify barbiturates
		25	Describe the mechanism of action and clinical uses of barbiturates
		26	Describe the difference regarding the mechanism of action of Barbiturates in comparison to Benzodiazepines
	Buspirone	27	Describe the mechanism of action and clinical use of Buspirone
		28	Describe the merits and demerits of Buspirone in comparison to Benzodiazepines
	Ramelteon	29	Describe the mechanism of action and clinical use of Ramelteon
	CNS stimulants	30	Classify CNS stimulants
	Psychomotor stimulants (Amphetamine, Methylphenidate)	31	Describe the mechanism of action,

			clinical uses, and adverse effects of Psychomotor stimulants
	Respiratory analeptics (Doxapram, Nikethamide)	32	Describe the mechanism of action, clinical uses and adverse effects of Respiratory analeptics
	Methyl xanthine/Theophylline, Caffeine, Theobromine)	33	Describe the mechanism of action, clinical uses and adverse effects of Methyl xanthine
	Sibutramine	34	Describe the mechanism of action and clinical use of Sibutramine
Forensic Medicine	Classification of neurotoxins	35	Define and classify neurotoxins
	Cerebral Poisons- Somniferous Poisons <ul style="list-style-type: none"> • Morphine • Opium • Heroin 	36	Describe and enlist Somniferous poison.
		37	Describe the mechanism of action for the Somniferous poison.
		38	Describe different signs, symptoms and autopsy appearance in

			a typical of Somniferous poisons.
		39	Describe fatal dose, treatment, and diagnosis for the Somniferous poisons.
		40	Describe medico-legal importance for the Somniferous poisons.
	Inebriant Poisons <ul style="list-style-type: none"> • Ethyl Alcohol • Methyl Alcohol 	41	Describe and enlist Inebriant poison.
		42	Describe mechanism of action for the Inebriant poison.
		43	Describe different sign, symptoms and autopsy appearance in a typical of Inebriant poisons.
		44	Describe fatal dose, treatment, and diagnosis for the Inebriant poisons.
		45	Describe medico-legal importance for the Inebriant poisons.
	Sedative & Hypnotics <ul style="list-style-type: none"> • Chloral hydrate • Barbiturates 	46	Describe and enlist sedative and hypnotics

		47	Describe mechanism of action for the Sedative and hypnotics.
		48	Describe different sign, symptoms and autopsy appearance in a typical of Sedative and hypnotics.
		49	Describe fatal dose, treatment, and diagnosis for the Sedative and hypnotics.
		50	Describe medico-legal importance for the Sedative and hypnotics.
	<p>Fuels, stimulants and hallucinogens</p> <ul style="list-style-type: none"> • Agrochemical poisons • Kerosene • Hallucinogens- LSD • Stimulants- Amphetamines 	51	Describe and enlist fuels, stimulants and hallucinogens.
		52	Describe mechanism of action of fuels, stimulants and hallucinogens.
		53	Describe different sign, symptoms and autopsy appearance in

			a typical case of fuels, stimulants and hallucinogens poisoning.
		54	Describe fatal dose, treatment, and diagnosis of fuels, stimulants and hallucinogens.
		55	Describe medico-legal importance of fuels, stimulants and hallucinogens.
	Drug Dependence	56	Describe Drug dependence and its psychological effects.
		57	Describe drug abuse and outline the procedure to investigate a case due to narcotics.
PRIME/MEDICAL EDUCATION	Emotional intelligence (EI)	58	Explain the concept of EI
		59	Differentiate between EQ and IQ
		60	Describe & Display appropriate emotional and social intelligence
Community medicine/epidemiology	Epidemiology	61	Define epidemiology

		62	Explain the basic concepts of epidemiology
	Study design	63	Classify and elaborate study designs
	Screening	64	Explain the screening in epidemiology
	Measures of mortality and morbidity	65	Explain the measures of morbidity and mortality
Theme 2: Disturbed mood & behavior			
Psychiatry (mood and anxiety disorders)	Depressive disorders	66	Classify depressive disorders
		67	Describe the etiology, clinical features and management protocols of different depressive disorders
	Atypical depression and seasonal affective disorder	68	Describe the clinical presentation of atypical depression
		69	Recognize the symptoms of atypical depression
		70	Describe the management of atypical depression and seasonal affective disorders

	Bipolar affective disorders	71	Describe the clinical features and management protocols of Bipolar affective disorders
	Suicide	72	Describe the preventive measures of suicide
	Anxiety disorders	73	Classify anxiety disorders
		74	Differentiate between medical and psychiatric causes of anxiety
		75	Differentiate between anxiety and phobia
		76	Describe the pharmacological and non-pharmacological management of different anxiety disorders including relaxation techniques and breathing exercises
	Dissociative disorders	77	Explain the different behavioral and neurological presentations of dissociative disorders

		78	Describe the pharmacological and non-pharmacological management of dissociative disorders
	Stress related disorders	79	Classify stress related disorders
		80	Explain the concept of stress in stress related disorders
		81	Explain the pharmacological and non-pharmacological management of stress related disorders
	Somatoform disorders	82	Classify somatoform disorders
		83	Describe the concept of medically unexplained symptoms
		84	Counsel a patient with medically unexplained symptoms
Psychiatry (Psychotic illnesses)	Personality disorders	85	Classify personality disorders
		86	Describe the clinical features, diagnostic criteria and

			management of personality disorder
	Psychotic disorders	87	Differentiate between organic and non-organic psychosis
		88	Explain the concept of psychosis
		89	Classify psychotic disorders
	Schizophrenias	90	Describe the clinical features, diagnostic criteria and management of Schizophrenias
		91	Explain the role of psychotherapy and Electroconvulsive therapy in Schizophrenias
		92	Describe the rehabilitations strategies with patients of Schizophrenias
	Delusional disorders	93	Describe the types and management of delusional disorders
		94	Describe the ways of differentiating delusional disorders from Schizophrenias

	Substance abuse disorders	95	Describe the concept of drug dependence
		96	Classify of drug abuse
		97	Describe the principles of management of substance abuse
		98	Explain the concept of harm reduction
General Medicine	Alzheimer`s disease and Dementias	99	Explain the pathophysiology, clinical features and management of Alzheimer`s disease
		100	Describe the reversible and irreversible causes of Dementia
Pharmacology	Depression	101	Describe the Monoamine hypothesis of depression
	Antidepressants	102	Classify antidepressants
	SSRIs (Selective Serotonin Reuptake Inhibitors)	103	Enlist SSRIs
		104	Enlist the most selective SSRIs
		105	Describe the pharmacokinetics, mechanism of action, clinical uses, adverse

			effects and drug interactions of SSRIs
	TCA's (Tricyclic Antidepressants)	10 6	Enlist TCA's
		10 7	Describe the mechanism of action, clinical uses, adverse effects and drug interactions of TCA's
	MAOIs (Monoamine Oxidase Inhibitors)	10 8	Enlist MAOIs
		10 9	Describe the pharmacokinetics, mechanism of action, clinical use, adverse effects and drug interactions of MAOIs
		11 0	Describe Serotonin syndrome
		11 1	Describe Hypertensive Cheese reaction
		11 2	Describe St John's Wort
		11 3	Describe the procedure of switching-over from one category of antidepressants to another one
		11 4	Describe "Augmentation" of

			antidepressant therapy
		11 5	Describe Electroconvulsive Therapy (ECT) for depression
	Psychoses (Schizophrenia and others)	11 6	Describe the Dopamine hypothesis of Schizophrenia
	Antipsychotics (Anti-schizophrenic drugs)	11 7	Classify Antipsychotics
		11 8	Describe the advantages of Atypical antipsychotics over the Typical (Classical/Traditional/Old) agents
		11 9	Describe the mechanism of action of Antipsychotics
		12 0	Describe the pharmacological effects of Antipsychotics
		12 1	Describe the clinical uses of Antipsychotics
		12 2	Describe the drug interactions of Antipsychotics

		12 3	Describe the adverse effects of Antipsychotics
		12 4	Explain the drug treatment of extrapyramidal syndrome
	Bipolar affective disorder (Manic Depressive illness)	12 5	Describe the concept of “mood-stabilization” in Bipolar affective disorder (Manic Depressive illness)
	Mood-stabilizing drugs	12 6	Enlist Mood-stabilizing drugs
	Lithium carbonate	12 7	Describe the pharmacokinetics, mechanism of action, clinical uses, adverse effects and drug interactions of Lithium carbonate
	Alcohols	12 8	Describe alcoholism
		12 9	Describe the pharmacokinetics of Ethanol
		13 0	Describe the mechanism of action of Ethanol

		13 1	Describe the pharmacological effects of Ethanol
		13 2	Describe the clinical uses of Ethanol
		13 3	Describe the adverse effects of Ethanol
		13 4	Describe Disulfiram-like reaction with example of drugs causing it
		13 5	Describe the management of Ethanol intoxication
		13 6	Describe the management of Ethanol withdrawal symptoms
		13 7	Describe the treatment of alcoholism
		13 8	Describe briefly Methanol poisoning
		13 9	Describe the antidote for Methanol poisoning
	Opioids (Morphine, Diamorphine, Codeine, Pethidine, Methadone, Pentazocine, Buprenorphine, Dextromethorphan)	14 0	Differentiate between Opioids and Opiates

		14 1	Describe the term "narcotic"
		14 2	Describe the source of Opium
		14 3	Enlist the "brain's own Morphine" (endogenous Opioids)
		14 4	Classify Opioids
		14 5	Enlist Opioids with mixed agonist- antagonist properties
		14 6	Enlist Opioids with partial agonist activity
		14 7	Describe the pharmacokinetics, mechanism of action, pharmacological effects, clinical uses, adverse effects and drug interactions of Opioids
		14 8	Describe the use of opioids as palliative care in terminal illness
		14 9	Describe opioid rotation
		15 0	Describe the treatment of Opioid over dosage

		15 1	Describe the Opioid antagonists (antidotes)
		15 2	Describe Opioid dependence
		15 3	Describe the management of Opioid dependence
		15 4	Describe the contraindications of Opioids
		15 5	Enlist the drugs used for pain in opioid addicts
	Tramadol	15 6	Describe the mechanism of action and clinical use of Tramadol
	Drugs of abuse	15 7	Describe substance abuse, drug dependence, addiction and habituation
		15 8	Describe the Dopamine hypothesis of addiction
		15 9	Enlist the drugs causing addiction
		16 0	Enlist the non-addictive drugs of abuse

		16 1	Describe "Club drugs"
		16 2	Enlist the drugs having high-risk of addiction (scored 5 on the list of relative-risk of addiction)
		16 3	Enlist the drugs having moderate-risk of addiction (scored 4 on the list of relative-risk of addiction)
		16 4	Describe the drug treatment of Nicotine, Alcohol, Cannabis and Opioid abuse
		16 5	Describe the drug abuse in sports with examples
Forensic Medicine	Insanity and relationship to criminal charges	16 6	Define insanity.
		16 7	Classify insanity and explain its sub-types
		16 8	Describe relationship of insanity with criminal charges.
		16 9	Describe different pleas and its legal exception based on unsoundness of mind.

		17 0	Describe McNaghten rules, Durham`s rule and Impulse along with its application and criticism.
		17 1	Differentiate between true and feigned insanity
	Forensic Psychiatry	17 2	Define and describe Forensic Psychiatry.
		17 3	Describe different terms used in Forensic Psychiatry: <ul style="list-style-type: none"> a) Affect b) Confabulation c) Delirium d) Delusion e) Fague f) Hallucination g) Illusion h) Intelligent Quotient i) Lucid Interval j) Neurosis k) Psychopath l) Psychosis m) Stupor n) Twilight states
	Mental health act	17 4	Define mental disorders based on mental health act

		17 5	Describe procedure of admission and discharge of mentally ill patient based on mental health act
		17 6	Describe procedure of handling a wandering lunatic
	Will	17 7	Define testamentary capacity
		17 8	Enlist conditions required for a valid Will
		17 9	Describe the role of a doctor in taking a Will from a sick person
	Civil and criminal responsibility of mentally ill patients	18 0	Explain the concept of civil and criminal responsibility of mentally ill patients
Community medicine	Mental health	18 1	Describe classification of mental health illnesses
		18 2	Define mental health
		18 3	Discuss global perspectives and epidemiology of mental health disorders

		18 4	Discuss risk factors leading to mental health problems
		18 5	Discuss prevention and control of mental health disorders
	Drug abuse and Alcoholism	18 6	Describe the global distribution and increase addiction to drug abuse and alcoholism
		18 7	Discuss causes of drug abuse and alcoholism
		18 8	Discuss the effects of alcoholism on mental health
		18 9	Describe preventive and control measures of drug abuse and Alcoholism
PRIME/MEDICAL EDUCATION	Conflict resolution	19 0	Explain the prerequisites for conflict resolution as a leader
		19 1	Show the ability to solve problems regarding difficult patients/attendant.
Community medicine/biostati stics	Biostatistics: Introduction	19 2	Describe the significance of

			biostatistics in health and epidemiology
	Data and variable types	19 3	Define and classify variables
	Sampling	19 4	Define sampling
		19 5	Discuss types of sampling
	Biases in epidemiological studies	19 6	Define Bias
		19 7	Discuss different types of biases
			Discuss how bias can be prevented
Theme-3: Right sided weakness and inability to speak			
Pathology	Hypoxia, ischemia and infarction	19 8	Define hypoxia, ischemia and infarction, and describe its morphology and consequences in the context of CNS involvement
	Intracranial hemorrhage	19 9	Describe the etiology, risk factors and morphology of intracranial hemorrhage
	Strokes syndromes	20 0	Describe the etiology, risk factors, morphology, and

			clinical and radiological features of stroke
	Subarachnoid hemorrhage (SAH)	20 1	Explain the etiology, risk factors and clinical features of SAH
General Medicine	Stroke	20 2	Describe the risk factors of stroke
		20 3	Explain the types of strokes
		20 4	Describe the clinical features, radiological features, and management of a patient with intracerebral bleed
		20 5	Describe the clinical features, radiological features, and management of a patient with stroke due to an infarction
Community medicine	Non-communicable diseases: Strokes	20 6	Discuss the epidemiological determinants of stroke in community
		20 7	Discuss the prevention and rehabilitation of strokes
Neurosurgery	Stroke	20 8	Describe the neurosurgical

			management of stroke and Subarachnoid hemorrhage
Community medicine/biostatistics	Measures of central tendency	209	Classify measures of central tendency
		210	Calculate measures of central tendency
		211	Interpret and signify the results
		212	Describe the advantages and disadvantages of different measures
	Measures of dispersion	213	Classify measures of dispersion
		214	Calculate measures of dispersion
		215	Interpret the results of measures of dispersion
		216	Explain the advantages and disadvantages of measures of dispersion
		217	Explain the use of different measures in specific circumstances
	Normal distribution	218	Define normal distribution

		21 9	Describe normal distribution
		22 0	Calculate and graphically represent normal distribution
		22 1	Explain its use & significance in relation to data
		22 2	Describe percentile and interquartile range
		22 3	Calculate and depict percentile and interquartile range
		22 4	Explain use and significance of these in different situations
	Confidence Interval, Confidence level, Standard error	22 5	Define confidence level and interval
		22 6	Describe confidence level and interval
		22 7	Calculate confidence level and interval
		22 8	Explain their use and significance in different situations
	P value, critical region, rejection region, alpha beta errors	22 9	Define P value, critical region, rejection region, α β errors
		23 0	Describe P value, critical region,

			rejection region, α β errors
		23 1	Calculate P value, critical region, rejection region, α β errors
		23 2	Describe their use and significance in different situations
Theme-4: Loss of consciousness and Fits			
General Medicine	Seizures	23 3	Define seizures
		23 4	Differentiate between a seizure and syncope
		23 5	Classify epilepsy
		23 6	Explain the pathophysiology, clinical features, risk factors, investigations and treatment of Tonic-Clonic epilepsy
		23 7	Explain the pathophysiology, clinical features, investigations and treatment of absence seizures
		23 8	Explain the pathophysiology, clinical features,

			investigations and treatment of psychomotor epilepsy
		23 9	Explain the management of a patient with status epilepticus
Pediatrics	Epilepsy	24 0	Explain the pathophysiology, clinical features, risk factors, investigations and treatment of Tonic-Clonic epilepsy in children
		24 1	Explain febrile convulsions and its management
		24 2	Describe Infantile spasm and its management
Anesthesia	Introduction to the subject	24 3	Define anesthesia
		24 4	Describe different types of anesthesia
	General anesthesia	24 5	Describe the methods of induction of anesthesia
	Neuroaxis block	24 6	Describe the following terms: <ul style="list-style-type: none"> • Spinal block • Epidural block

			<ul style="list-style-type: none"> • Caudal block • Combined spinal /Epidural
	Regional anesthesia	24 7	<p>Describe the following terms:</p> <ul style="list-style-type: none"> • Nerve block • Single shot • Continuous infusion • Local infiltration
	Preoperative evaluation and risk assessment	24 8	Explain the purpose of preoperative evaluation
		24 9	Perform risk assessment of patient undergoing general anesthesia
		25 0	Describe the steps of history taking in preoperative evaluation for anesthesia
		25 1	Describe the plans of general and regional anaesthesia techniques
		25 2	Describe the ASA classification for pre-

			operative risk assessment
	Monitoring in anesthesia	25 3 25 4	Describe the non-invasive and invasive techniques of patients` monitoring for the following parameters during general anaesthesia <u>Non-invasive:</u> a. Oxygenation b. Hemodynamics c. Temperature d. Electrical activity e. Neuromuscular activity f. Circulation <u>Invasive:</u> a. Oxygenation b. Hemodynamics c. Temperature d. Cardiac output e. Central venous pressure f. Circulation
Pharmacology	Anti-seizure drugs (Anti-epileptics)	25 5	Classify anti-seizure drugs

		25 6	Enlist the “Broad-spectrum” anti-epileptics (Valproate and Lamotrigine)
	Carbamazepine	25 7	Describe the mechanism of action, clinical uses, adverse effects and drug interactions of Carbamazepine
	Phenytoin	25 8	Describe the pharmacokinetics of Phenytoin with reference to the phenomenon of zero-order kinetics
		25 9	Describe the mechanism of action, clinical uses, adverse effects and drug interactions of Phenytoin
	Valproate	26 0	Describe the mechanism of action, clinical uses, adverse effects and drug interactions of Valproate
	Ethosuximide	26 1	Describe the mechanism of action, clinical uses and

			adverse effects of Ethosuximide
	Phenobarbitone	26 2	Describe briefly the historic role of phenobarbitone in the management of epilepsy
	Benzodiazepines	26 3	Name the benzodiazepines used in the management of epilepsy
	Lamotrigine, Topiramate and others	26 4	Name the new antiepileptic drugs
		26 5	Describe the mechanism of action, clinical uses and adverse effects of Lamotrigine and Topiramate
		26 6	Describe the use of antiepileptics during pregnancy
		26 7	Describe drug interaction of antiepileptics with oral contraceptive pills
	Status epilepticus	26 8	Describe the management of status epilepticus
	General anesthetics	26 9	Describe the stages of general anesthesia

		27 0	Describe balanced anesthesia
		27 1	Classify General anesthetics
	Inhaled anesthetics (N ₂ O, Halothane, Isoflurane, Sevoflurane, Desflurane)	27 2	Describe the pharmacokinetics of Inhaled anesthetics
		27 3	Discuss the clinical significance of Blood: Gas partition coefficient of Inhaled anesthetics
		27 4	Describe the mechanism of action of Inhaled anesthetics
		27 5	Define MAC ₅₀ (minimum Alveolar Concentration- 50%)
		27 6	Describe the significance of MAC ₅₀
		27 7	Describe the pharmacological effects of Inhaled anesthetics
		27 8	Describe the adverse effects of Inhaled anesthetics
		27 9	Describe second gas effect
		28 0	Describe diffusion hypoxia

		28 1	Describe Malignant hyperthermia and its management
		28 2	Describe the properties of an ideal inhaled anesthetics
	IV anesthetics (Thiopentone, Propofol, Etomidate, Ketamine, Midazolam, Fentanyl)	28 3	Describe the mechanism of action, clinical use and adverse effects of Intravenous anesthetics
		28 4	Describe re-distribution of Thiopentone
		28 5	Define neuroleptanalgesia and neuroleptanaesthesia
		28 6	Describe dissociative anesthesia
		28 7	Name the anesthetic agent that causes dissociative anesthesia
		28 8	Describe TIVA (Total Intravenous Anesthesia) technique
	Pre-anesthetic medications	28 9	Describe Pre-anesthetic medications

		29 0	Describe the drugs used as Pre-anesthetic medications
	Obstetric analgesia	29 1	Describe the drugs for obstetric analgesia
Forensic medicine	Deliriant Poisons <ul style="list-style-type: none"> • Dhatura • Hyocyamus nigra Cannabis indica	29 2	Describe and enlist Deliriant poisons.
		29 3	Describe mechanism of action of the Deliriant poisons.
		29 4	Describe different sign, symptoms and autopsy appearance in a typical of Deliriant poisons.
		29 5	Describe fatal dose, treatment, and diagnosis of the Deliriant poisons.
		29 6	Describe medico-legal importance of the Deliriant poisons.
Community medicine/biostatistics	Z test & it's application, Types / shapes of frequency distribution	29 7	Define & Describe 'z' test
		29 8	Describe its use in different statistical settings

		29 9	Calculate 'z' test
		30 0	Explain its application in hypothesis testing
		30 1	Interpret and apply to clinical settings
		30 2	Discuss various shapes of frequency distribution
		30 3	Describe the applications of parametric and non-parametric tests
Theme-5: Tremors			
Pathology	Neurodegenerative disorders: <ul style="list-style-type: none"> • Alzheimer`s disease • Parkinson`s disease • Huntington`s Disease and Spinocerebellar ataxias Motor Neuron disease	30 4	<ul style="list-style-type: none"> • Describe the etiology, risk factors, morphology and clinical features of Alzheimer`s disease • Describe the etiology, risk factors, morphology and clinical features of Parkinson`s disease

			<ul style="list-style-type: none"> Describe the etiology, risk factors, morphology and clinical features of Huntington`s disease Describe the clinical features of spinocerebellar ataxias <p>Describe the etiology, risk factors, morphology and clinical features of Motor Neuron Disease</p>
General Medicine	Parkinson`s disease	30 5	Describe the etiology, risk factors, clinical features and management of Parkinson`s disease
		30 6	Describe the types, clinical presentation and management of Motor neuron disease
Pharmacology	Drugs for Parkinsonism	30 7	Classify drugs for Parkinsonism
	Levodopa (with Carbidopa)	30 8	Describe the pharmacokinetics,

			mechanism of action, adverse effects, contraindications and drug interactions of Levodopa
		309	Discuss the rationale of combining Carbidopa (or Benserazide) with Levodopa
		310	Describe the on-off phenomenon
		311	Describe the end-of-dose akinesia
		312	Describe “drug holidays” for Levodopa
	Bromocriptine	313	Describe the mechanism of action, clinical uses and adverse effects of Bromocriptine
	Selegiline	314	Describe the mechanism of action and clinical uses of Selegiline
		315	Describe the differentiating point regarding the use of Selegiline as antiparkinsonian drug

			and its use as an antidepressant drug
	Apomorphine	31 6	Describe the mechanism of action and clinical use of Apomorphine
	Drug-induced Parkinsonism	31 8	Enlist the drugs causing Parkinsonism-like symptoms
		31 9	Enlist the drugs used in the management of drug-induced Parkinsonism
		31 0	Describe the rationale of avoiding Levodopa in drug-induced Parkinsonism
Pediatrics	Cerebellar ataxias	31 1	Describe the clinical features and management of Friedreich's Ataxia
Community medicine/biostatistics	"t" test & its application	31 2	Define & Describe 't' test
		31 3	Explain its use in different statistical settings
		31 4	Calculate 't' test

		31 5	Describe its application in hypothesis testing
		31 6	Interpret and apply to clinical settings
		31 7	Calculate degree of freedom
	Chi square test & its application	31 8	Describe 'x ² ' test
		31 9	Describe its use in different statistical settings
		32 0	Calculate 'x ² ' test
		32 1	Explain its application in hypothesis testing
		32 2	Interpret and apply to clinical settings
	Correlation, regression	32 3	Describe Correlation & Regression
		32 4	Interpret and apply to clinical settings
	Practical Problems in biostatistics	32 5	Discuss practical problems encountered in the application of biostatistics and SPSS
Theme-6: Headache			
Pathology	Meningitis	326	Explain the etiology, clinical features, investigations and

			complications of acute pyogenic meningitis
		327	Explain the etiology, clinical features, investigations and complications of Tuberculous meningitis
	Encephalitis	328	Explain the etiology, clinical features, investigations and complications of viral encephalitis
	Brain abscess	329	Explain the etiology, clinical features, investigations and complications of brain abscess
	Cerebral Toxoplasmosis	330	Explain the etiology, clinical features, investigations and complications of Cerebral Toxoplasmosis
	Tumors of CNS	331	Describe the classification of brain tumors on the basis of primary and secondary origin and benign and malignant

	<ul style="list-style-type: none"> • Gliomas • Embryonal neoplasms • Meningioma <p>Other neoplasms</p>	332	<ul style="list-style-type: none"> • Describe the classification, gross and microscopic morphology and clinical features of Gliomas • Describe the classification, gross and microscopic morphology and clinical features of embryonal neoplasms of brain • Describe the gross and microscopic morphology and clinical features of Meningioma • Enlist brain neoplasms other than gliomas, meningioma
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			<p>and embryonal cell neoplasms</p> <ul style="list-style-type: none"> • Enlist the metastatic brain neoplasms
Pharmacology	Migraine and Cluster headaches	333	Classify drugs used for the treatment of Migraine and Cluster headaches
		334	Enlist the drugs used for the prophylaxis of Migraine and Cluster headaches
	Triptans (Sumatriptan and others)	335	Describe the mechanism of action, clinical use and adverse effects of Sumatriptan
	Ergot alkaloids	336	Enlist Ergot alkaloids
		337	Describe the pharmacological effects of Ergot alkaloids
	Ergotamine	338	Describe the mechanism of action, clinical use and adverse effects of Ergotamine

	Neuralgias (Neuropathic pain)	339	Describe the drug treatment of neuralgias (Trigeminal, post-herpetic and others)
Forensic Medicine	Head Injury	340	Describe head injury in relation to scalp and skull injuries.
		341	Classify different varieties of skull fractures.
		342	Explain commonest site of skull fracture.
		343	Describe mechanism of cerebral injury including coup and counter coup mechanism.
		344	Describe injuries to cranial content and its medicolegal importance.
		345	Describe intracranial hemorrhages and its types in detail as per medicolegal point of view.
		346	Describe the medicolegal aspects of Punch drunk syndrome

General Medicine	Meningitis	347	Explain the etiology, pathogenesis, clinical presentation, investigations and management of Acute pyogenic meningitis
		348	Explain the etiology, pathogenesis, clinical presentation, investigations and management of Tuberculous meningitis
	Encephalitis	349	Explain the etiology, pathogenesis, clinical presentation, investigations and management of viral encephalitis
Community medicine	Rabies	350	Explain the etiology, clinical presentation of a patient with Rabies
		351	Describe post-exposure prophylaxis of Rabies
Family medicine	Rabies prophylaxis	352	Describe the types of wounds inflicted by rabid dog bite
		353	Explain the types of active and passive immunisation for

			Rabies post-exposure prophylaxis
		354	Describe the indications of Rabies vaccine and immunoglobulins
Pediatrics	Meningitis	355	Explain the etiology, pathogenesis, clinical presentation, investigations and management of Acute pyogenic meningitis in children and neonates
	TBM	356	Explain the etiology, pathogenesis, clinical presentation, investigations and management of Acute pyogenic meningitis in children
Psychiatry	Chronic daily headache	357	Differentiate between neurological and psychological headache (chronic tension headache)
		358	Identify the red signs in patients with headache
		359	Describe the principles of management of

			acute and chronic headaches
PRIME/RESEARCH	Data analysis	360	Use MS Excel for data analysis
		361	Use SPSS for data analysis
		362	Use Endnote for reference management
		363	Compile, analyze and write a dissertation
Theme-7: Paraplegia			
Pathology	Multiple sclerosis and other demyelinating disorders of CNS	364	Explain the pathogenesis, morphology and clinical features of multiple sclerosis
		365	Describe the morphology of the following: <ul style="list-style-type: none"> • Acute demyelinating encephalomyelitis • Acute necrotizing hemorrhagic encephalitis
Forensic Medicine	Neurotoxins: Spinal Poisons	366	Describe and enlist spinal poison.

		36 7	Describe mechanism of action for the spinal poison.
		36 8	Describe different sign, symptoms and autopsy appearance in a typical case of spinal poisons.
		36 9	Describe fatal dose, treatment, and diagnosis for the spinal poisons.
		37 0	Describe medico-legal importance for the spinal poisons.
		37 1	Describe vertebral and spinal injuries
	Snake bite neurotoxins	37 2	Describe different sign, symptoms and autopsy appearance in a typical case of snake bite poisons.
	Botulism toxins	37 3	Describe different sign, symptoms and autopsy appearance in a typical case of botulism
General Medicine	Multiple sclerosis	37 4	Explain the pathophysiology, clinical features and

			management of Multiple sclerosis
	Transverse myelitis	37 5	Describe the etiology, pathophysiology, clinical features and management of Transverse myelitis
	Caries spine	37 6	Explain the pathophysiology, clinical features, investigations and management of Caries spine
Orthopedics	Traumatic paraplegia	37 7	Describe the general management of a patient with traumatic paraplegia
Neurosurgery	Traumatic paraplegia	37 8	Describe the general management of a patient with traumatic paraplegia
		37 9	Describe the types, clinical features and surgical management of spinal tumors
Theme-8: Numbness and tingling			
Pathology	Patterns and types of peripheral nerves injury	38 0	Describe the patterns and types of neuronal injury
	Acute and chronic demyelinating neuropathies	38 1	Describe the pathophysiology and

			clinical features of Guillain Barre syndrome
		38 2	Explain the pathophysiology of Chronic demyelinating polyneuropathies
	Myasthenia Gravis	38 3	<ul style="list-style-type: none"> Describe the pathophysiology and clinical features of Myasthenia Gravis
	Tumors of Peripheral nerves	38 4	Enlist the tumors of peripheral nerves
		38 5	Describe the clinical features, of Neurofibromatosis
Pharmacology	Local anesthetics (Lignocaine and others)	38 6	Classify Local anesthetics
		38 7	Enlist the Local anaesthetics used for surface anaesthesia
		38 8	Enlist the Local anesthetics used for infiltration anesthesia, nerve block, spinal anesthesia and epidural anesthesia

		38 9	Describe EMLA (Eutectic Mixture of Local Anesthetics) and its clinical use
		39 0	Describe the pharmacokinetics of Local anesthetics
		39 1	Describe the mechanism of action of Local anesthetics
		39 2	Describe the pharmacological effects of Local anesthetics on nerves
		39 3	Describe the differential blockade of peripheral nerves by Local anesthetics
		39 4	Describe the pharmacological effects of Local anaesthetics on other excitable membranes
		39 5	Describe the clinical uses of Local anaesthetics
		39 6	Describe the major advantages of adding Adrenaline to Lignocaine for

			infiltration anaesthesia
		39 7	Calculate the quantity of Adrenaline/ml in the traditionally used combinations of Adrenaline and Lignocaine (i.e. 1:200,000 & 1: 80,000)
		39 8	Describe the adverse effects of Local anaesthetics
Forensic Medicine	Neurotoxins: Peripheral poison	39 9	Describe and enumerate peripheral poisons.
		40 0	Describe mechanism of action for the peripheral poisons.
		40 1	Describe different sign, symptoms and autopsy appearance in a typical of peripheral poisons.
		40 2	Describe fatal dose, treatment, and diagnosis for the peripheral poisons.
		40 3	Describe medico-legal importance for the peripheral poisons.

General Medicine	Guillain Barre syndrome	40 4	Explain the pathophysiology, clinical features and management of Guillain Barre syndrome
	Neuropathies	40 5	Describe the causes, types, distribution and clinical features of different neuropathies
	Myasthenia Gravis	40 6	Explain the pathophysiology, clinical features and management of Myasthenia Gravis
		40 7	Describe the clinical features, types and management of Neurofibromatosis
Pediatrics	Hereditary neuropathies	40 8	Describe the types, clinical features and management of hereditary neuropathies
Orthopedics	Peripheral nerve injury	40 9	Describe the types and management of peripheral nerve injury
		41 0	Explain entrapment neuropathies

		41 1	Describe the risk factors, clinical features and management of Carpal tunnel syndrome
Practical Work			
Pathology	CSF	41 2	<ol style="list-style-type: none"> 1. Describe the chemical, cytological composition of CSF 2. Estimate the following analysis of CSF: <ul style="list-style-type: none"> • Chemistry • Cytology • Gram stain • Microbiology
	Histopathological specimens of brain tumors	41 3	Identify the gross structure and microscopic features of: <ul style="list-style-type: none"> • Meningioma • Glioma/Astrocytoma
Pharmacology	Depression	41 4	Formulate a prescription for a newly diagnosed case of depression

	Epilepsy	41 5	Formulate prescriptions for patients with Tonic-Clonic and Petit-mal epilepsy
	Migraine headache	41 6	Formulate prescription for a patient with migraine headache
Forensic medicine	Somniferous poisons	41 7	Recognition of Opium and Heroin
	Inebriant poisons	41 8	Recognition of Ethyl Alcohol and its examination
	Fuel	41 9	Recognition of Kerosene oil
	Deliriant	42 0	Recognition of Dhatura and Cannabis
	Spinal poison	42 1	Recognition of Nux Vomica seeds
Community medicine	Data presentation <ul style="list-style-type: none"> • pie chart • histogram • bar chart and its types • venn diagram • scatter plot 	42 2	Identify and interpret the charts
	Application and Interpretation of statistical data	42 3	Apply a statistical test on a given scenario
	Data interpretation	42 4	Interpret the normal distribution curve, skewed distribution, bi and poly-modal distribution & Standard Normal Curve

Approximate hours distribution of different disciplines

S. No	Subject	Hours (approximate)
1	Pathology	24
2	Pharmacology	22
3	Forensic medicine	20
4	Community medicine	36
5	General medicine	12
6	Psychiatry	10
7	Pediatrics	5
8	Neurosurgery	2
9	Orthopedics	1
10	Anaesthesia	4
11	PRIME/MEDICAL EDUCATION	2
12	PRIME/RESEARCH*	16**
12	Family medicine	1
	TOTAL	139

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

**the final marks of research events are NOT included in total hours as these are not used in developing assessment blueprints.