

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Neuroscience II
Course number	MDCN3422
Faculty	
Department	
Course type	Major Needs
Course level	3
Credit hours (theoretical)	4
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

- 1 - Neurochemistry and Neuropharmacology: Explore the chemical basis of neural communication and the effects of drugs on the nervous system
- 2 - Neurological Disorders: Study the pathology, diagnosis, and treatment of various neurological disorders such as Alzheimers disease, Parkinsons disease, stroke, epilepsy, and multiple sclerosis.
- 3 - Neural Plasticity and Learning: Understand how the brain changes structurally and functionally in response to experiences and learning.
- 4 - Ethical Considerations in Neuroscience: Discuss the ethical implications of neuroscience research and clinical practice
- 5 - Learn about the electrical and chemical signaling mechanisms within the nervous system.
- 6 - Study the anatomy of the brain, spinal cord, and peripheral nervous system

Intended Learning Outcomes

Knowledge and Understanding	<ul style="list-style-type: none"> * Identify and describe the structural anatomy of the diencephalon, brainstem and reticular formation * Describe the vegetative and hormonal functions of the central nervous system * Describe and Understand the pathophysiological mechanisms of sleep and epilepsy in parallel with the pharmacology of sedatives and that of the antiepileptic drugs * Describe the anatomy of the limbic system and Understand the physiological mechanisms underlying behavior, motivation, and emotions * Describe the neural circuits implicated in speech, learning, and memory and correlating them with the pathology and pharmacology of the neurodegenerative diseases of the CNS * Know the biochemical structure of myelin and Understand the immunological basis of demyelinating disorders of the nervous system * Comprehend the neurobiology of mental disorders in order to Understand the mechanistic actions of the different antidepressant and antipsychotic medications * Describe the anatomy and physiology of the peripheral nervous system and integrate them
Intellectual Skills	<ul style="list-style-type: none"> * Integrate the basic anatomical & physiological facts of nervous system with clinical data * Correlate functional alterations of common pathological conditions and diseases of nervous system with clinical data. * Correlate the Role of Hypothalamus in: Endocrine Regulation, Thermoregulation and Food & Water Intake * Use problem solving skills in a variety of practical and clinical situations related to nervous system
Professional Skills	<ul style="list-style-type: none"> * Compare the structure of Hypothalamus and Thalamus * Analyze the CSF * Analyze Motivation and Behavior. * Test for disorders of the Motor Cortex (Convulsions & Epilepsy) * Test for Brain complex functions of the cognition: (Attention, Recognition, and Planning) * Comment about the role of Dopamine, Glutamate and GABA in Parkinson Disease * Comment on observed demonstrations on the effect of some drugs on nervous system functions and comment on the graph
General Skill	<ul style="list-style-type: none"> * Respect superiors, colleagues and any other members of the health profession * Communicate ideas and arguments effectively * Be prepared for the lifelong learning needs of the medical profession Nervous System * Work constructively and cooperatively within a team. * Practice self and peer evaluation & Manage time effectively in Nervous System.

Course Contents

- 1 - Anatomy of the Hypothalamus and Thalamus
- 2 - The Role of Hypothalamus in: - Endocrine Regulation - Thermoregulation - Food & Water Intake
- 3 - Drugs used for Regulation of Temperature and Food Intake
- 4 - Disorders of the Motor Cortex (Convulsions & Epilepsy)
- 5 - The Role of Glutamate and GABA in the Epileptic process Experimental Results
- 6 - Treatment of Epilepsy. (Anti-Epileptic Drugs)
- 7 - Basal Ganglia and the Regulation of Motor Activity
- 8 - Role of Dopamine, Glutamate and GABA in Parkinsons Disease. Experimental Results
- 9 - Degenerative Disorders of the Basal Ganglia
- 10 - Treatment of Parkinsons Disease
- 11 - Complex Functions of the Brain Cognition: (Attention, Recognition, Planning)
- 12 - Memory: Short Term and Long Term
- 13 - Brain Stem and Reticular Formation
- 14 - Sleep and Wakefulness
- 15 - Sedatives and Hypnotics
- 16 - The Process of Learning (Understanding & Speaking)
- 17 - Anatomy of Limbic system
- 18 - Physiology of Emotions
- 19 - CNS Stimulants & Drugs of Abuse
- 20 - Motivation and Behavior
- 21 - Treatment of Dementia & Drugs for Schizophrenia
- 22 - Prions and slow viruses Rabies and Arboviruses
- 23 - Sphingolipids & Myelin metabolism
- 24 - Demyelinating diseases of the CNS
- 25 - Drugs for Depression
- 26 - Immunological Diseases of the CNS
- 27 - Encephalitis
- 28 - Physiology of Peripheral Nervous System
- 29 - Immunological diseases of the PNS
- 30 - Polio Virus and Enteroviruses Toxoplasmosis, Malaria, Hydatid Disease
- 31 - Peripheral Neuropathy & Tumors of the PNS

Teaching and Learning Methods

- 1 - Lectures, where professors or experts in the field deliver presentations on various topics
- 2 - laboratory sessions where students engage in hands-on activities.
- 3 - Small group discussions or tutorials are used to encourage active participation and critical thinking
- 4 - multimedia resources, such as videos, interactive online modules, and virtual reality applications
- 5 - Case Studies: Case studies present students with real or hypothetical neurological cases, challenging them to analyze and diagnose the conditions based on their knowledge
- 6 - Problem-Based Learning (PBL)

Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
Paper One Exam		40 %
Paper Two Exam		40%
Practical Sessions		20 %

Books and References

Recommended books	Clinical anatomy by systems, R.S. Snell, (latest edition)
	Grants Atlas of Anatomy or any other reasonable colored atlas of Human Anatomy
	Neuroscience 6th Edition by Dale Purves , George J. Augustine , David Fitzpatrick
	Biochemistry – Chapme, Harvey and Ferrier, LIPPINCOTT, WILLIAMS & WILKINS, (latest edition)
	Pharmacology, Lippincott's Illustrated Review, (latest edition)
	Basic Histology, by L.Carlos Junqueira, Jose Carneiro, Robert O. Kelley, (latest edition)
	Basic Pathology, Kumar, W.B. Saunders, (latest edition)
	Review of Medical Microbiology and Immunology, Levinson, W. (latest edition)
	Roitt's Essential Immunology, thirteenth Edition by Ivan M. Roitt , Peter J. Delves, D. Butron and S. J. Martin 2017.