

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Neuroscience (2)
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.