

ESSENTIALS OF NEUROSCIENCE COURSE 2023

SEPTEMBER 2 & 3, 2023

REHMAN MEDICAL
INSTITUTE, PESHAWAR



DR. SYED ATHER ENAM, SI
MD, PHD, FRCSI, FRCSC, FRCSG, FACS
PROFESSOR OF NEUROSURGERY
SCIENTIFIC DIRECTOR
JUMA RESEARCH LABORATORIES
AGA KHAN UNIVERSITY, KARACHI
FOUNDING PRESIDENT, PASBAN

ESSENTIALS OF NEUROSCIENCE COURSE 2023

COURSE OUTLINE

DAY 1

REGISTRATIONS		7:00 - 7:15	15 MINUTES
INTRODUCTION		7:15 - 7:40	25 MINUTES
MODULE 1: NEURON TO NERVOUS SYSTEM	LECTURE I-A: OVERALL DESIGN OF THE NERVOUS SYSTEM GENERAL LAYOUT OF THE HUMAN NERVOUS SYSTEM, SURFACE ANATOMY OF BRAIN AND FUNCTION, FIBER TRACTS, SPINAL CORD, SPINAL REFLEX, AND BRAINSTEM.	7:40 - 8:40	60 MINUTES
	BREATHER	8:40 - 8:45	5 MINUTES
	LECTURE I-B: NERVOUS SYSTEM AT THE CELLULAR LEVEL NEURON, GLIA, MYELIN, CELL MEMBRANE, NEURAL AND GLIAL CYTOSKELETON, AXOPLASMIC TRANSPORT, HISTOLOGY OF CEREBRAL CORTEX	8:45 - 9:45	60 MINUTES
	QUIZ I	9:45 - 9:50	5 MINUTES
	Q/A AND DISCUSSION	9:50 - 10:00	10 MINUTES
TEA BREAK		10:00 - 10:20	20 MINUTES
MODULE 2: THE CHATting NEURONS	LECTURE II-A: ELECTRICAL PROPERTIES OF NEURONS RESTING MEMBRANE POTENTIAL, ION CHANNELS AND TRANSPORTERS, NERNST EQUATION AND GOLDMAN-HODGKIN-KATZ VOLTAGE EQUATION, ACTION POTENTIAL AND MYELIN	10:20 - 11:20	60 MINUTES
	BREATHER	11:20 - 11:25	5 MINUTES
	LECTURE II-B: SYNAPTIC TRANSMISSION CELLULAR COMMUNICATION, ELECTRICAL AND CHEMICAL SYNAPSES, NEUROTRANSMITTERS, NEUROPEPTIDES, SYNAPTIC VESICLES AND RELEASE, METABOTROPIC AND IONOTROPIC RECEPTORS, SECOND MESSENGER SYSTEM	11:25 - 12:25	60 MINUTES
	QUIZ II	12:25 - 12:30	5 MINUTES
	Q/A AND DISCUSSION	12:30 - 12:40	10 MINUTES

DAY 1 (CONT.)

LUNCH & NAMAZ BREAK		12:40 - 13:40	60 MINUTES
MODULE 3: DEEP IN THE BRAIN	LECTURE III-A: BASAL GANGLIA AND THALAMUS BASAL GANGLIA AND COMPONENTS, MOTOR CONTROL BY BASAL GANGLIA, ANATOMY AND FUNCTION OF THALAMUS, BASAL GANGLIA AND THALAMUS IN DISEASE	13:40 - 14:40	60 MINUTES
	BREATHER	14:40 - 14:45	5 MINUTES
	LECTURE III-B: CEREBELLUM AND RETICULAR ACTIVATING SYSTEM ANATOMY OF CEREBELLUM, DEEP CEREBELLAR NUCLEI, CEREBELLAR CIRCUIT, RETICULAR ACTIVATING SYSTEM ANATOMY AND FUNCTION, CIRCADIAN RHYTHM, VESTIBULOCOCHLEAR SYSTEM	14:45 - 15:45	60 MINUTES
	QUIZ III	15:45 - 15:50	5 MINUTES
	Q/A AND DISCUSSION	15:50 - 16:00	10 MINUTES
TEA BREAK		16:00 - 16:20	20 MINUTES
MODULE 4: UNDERSTANDING MEMORY, BEHAVIOUR, AND EMOTIONS	LECTURE IV-A: NEUROBIOLOGY OF MEMORY TYPES OF MEMORY, DEMENTIA, HABITUATION AND SENSITIZATION, LONG TERM POTENTIATION AND DEPRESSION, MOLECULAR CORRELATES OF MEMORY, DENDRITIC SPINES, SYNAPTIC PLASTICITY	16:20 - 17:20	60 MINUTES
	BREATHER	17:20 - 17:25	5 MINUTES
	LECTURE IV-B: NEUROBIOLOGY OF BEHAVIOR AND EMOTIONS LIMBIC SYSTEM, TYPES OF EMOTION, AMYGDALA, NEUROPHYSIOLOGY OF PAIN, NEUROTRANSMITTERS OF EMOTION, HYPOTHALAMUS OLFATORY AND GUSTATORY, PAIN	17:25 - 18:25	60 MINUTES
	QUIZ IV	18:25 - 18:30	5 MINUTES
	Q/A AND DISCUSSION	18:30 - 18:40	10 MINUTES

DAY 2

RECAP OF DAY 1

8:00 - 8:30

30 MINUTES

MODULE 5: THE AMAZING STORY OF BRAIN DEVELOPMENT

LECTURE V-A: CNS DEVELOPMENT I

NEURAL TUBE FORMATION, CONGENITAL ABNORMALITIES, HOMEBOX GENES, EMBRYONIC INDUCTION, NEURONAL MIGRATION, NEUROTROPHIC FACTORS

8:30 - 9:30

60 MINUTES

BREATHER

9:30 - 9:35

5 MINUTES

LECTURE V-B: EVOLUTION OF HUMAN BRAIN

SINGLE CELL TO MULTICELLULAR ORGANISM, SIMPLE NERVOUS SYSTEM, GROWTH OF BRAIN, COMPARISON OF BRAIN OF MAMMALS, PRIMATES AND GENUS HOMO.

9:35 - 10:35

60 MINUTES

QUIZ V

10:35 - 10:40

5 MINUTES

Q/A AND DISCUSSION

10:40 - 10:50

10 MINUTES

TEA BREAK

10:50 - 11:10

20 MINUTES

MODULE 6: WHAT IS SPECIAL ABOUT THE HUMAN BRAIN

LECTURE VI-A: COGNITION AND COMMUNICATION

NEURAL BASIS OF LANGUAGE, APHASIAS, VISUAL SYSTEM, FROM IMAGE ON THE RETINA TO SIMPLE PERCEPTION AND COGNITION, ASSOCIATION CORTEX AND COGNITION.

11:10 - 12:10

60 MINUTES

BREATHER

12:10 - 12:15

5 MINUTES

LECTURE VI-B: AWARENESS AND CONSCIOUSNESS

NEUROANATOMY OF ATTENTION AND PLANNING, NEURAL BASIS OF INTELLIGENCE, THOUGHTS ABOUT AWARENESS AND CONSCIOUSNESS.

12:15 - 13:15

60 MINUTES

QUIZ VI

13:15 - 13:20

5 MINUTES

Q/A AND DISCUSSION

13:20 - 13:30

10 MINUTES

CLOSING CEREMONY

13:30 - 13:45

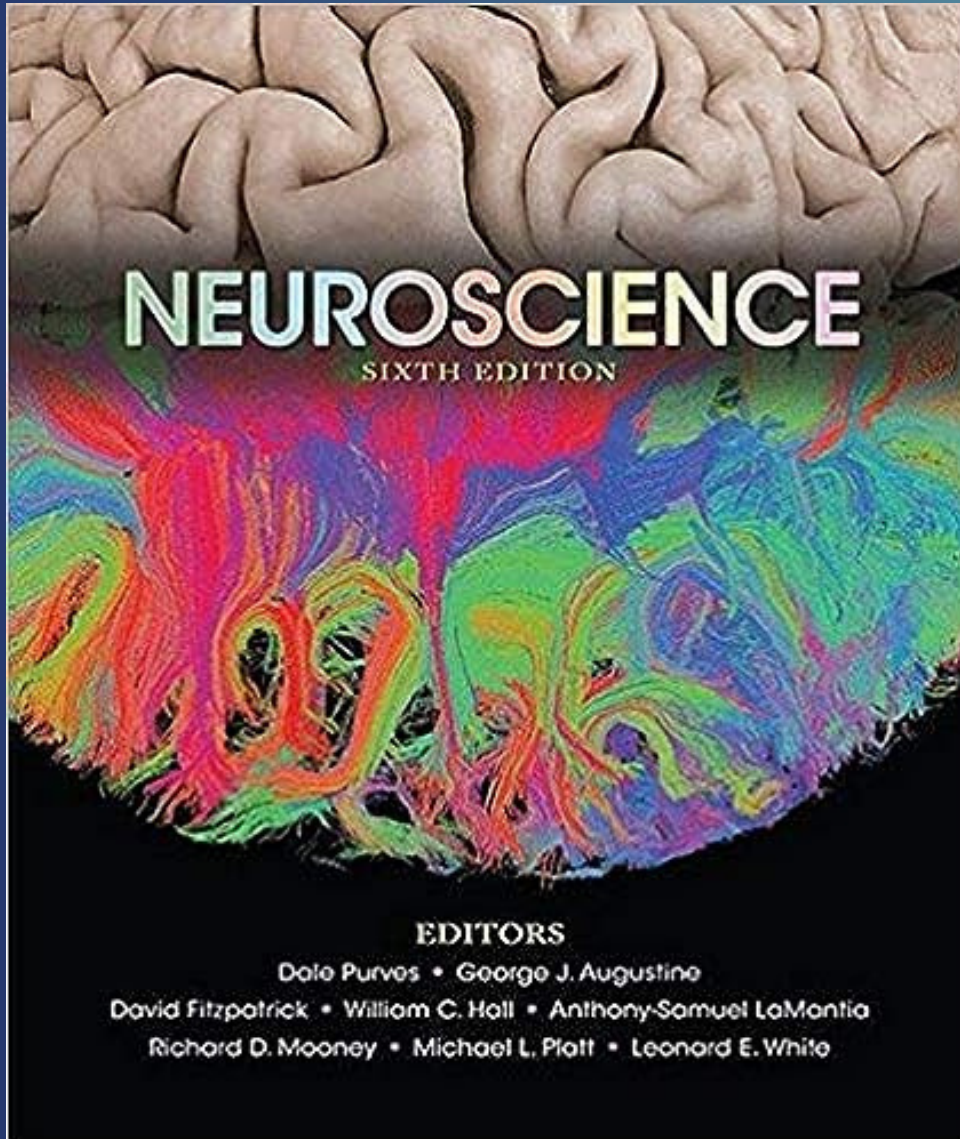
15 MINUTES

LUNCH AND NAMAZ

13:45 - 15:00

75 MINUTES

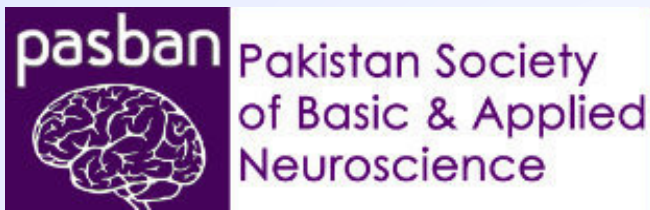
BOOK REFERENCE FOR THE COURSE



Neuroscience 6th Edition.

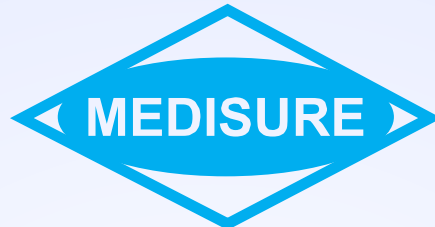
Edited by Dale Purves, George J. Augustine, David Fitzpatrick, William C. Hall, Anthony-Samuel LaMantia, Richard D. Mooney, Michael L. Platt, and Leonard E. White, Oxford University Press, October 2017, ISBN: 9781605353807

WE ARE GRATEFUL TO OUR COLLABORATORS FOR THEIR SUPPORT!



AN AFFILIATE OF THE
NATIONAL CENTRE FOR BIG DATA
& CLOUD COMPUTING AT CECOS & RMI

SPECIAL THANKS TO OUR PARTNERS FOR THEIR GENEROUS CONTRIBUTION!



For the health of humanity



Citanew
(Escitalopram) 5mg, 10mg, 20mg Tabs
10mg/ml Drops

Zeegap
Pregabalin
20mg, 50mg, 75mg, 100mg
& 150mg Capsules

LERACE
Levetiracetam
250, 500, 750mg & 1000mg 40 Tablets,
200mg Tablets, 500mg/5ml & 1000mg
500mg/5ml Oral Solution

