EDO UNIVERSITY IYAMHO
Department of Physiology
PHS 301 Neurophysiology

Instructor: *Dr. Akhabue K. Okojie*, email:Okojie.akhabue@edouniversity.edu.ng
Lectures: Monday (8-10am) and Wednesday 10am ï 12noon), LT2, phone: (+2348063762090)
Office hours: Monday-Friday, 10am - 3.00pm,
Office: Room 37, 1st Floor, College of Medicine Building, New Jerusalem.

General overview of lecture: Neurophysiology is the scientific study of the brain and nervous system, whose ultimate goal is to understand higher brain function at a variety of levels. This course will provide students with current knowledge about brain structure and function from both a basic research and a clinical perspective, and to allow them to use this knowledge in completing independent or small-group term papers.

Prerequisite: The students are expected to have a strong background in general principles of physiology, cell physiology and excitable tissues.

Learning outcomes: At the completion of this course, students are expected to:

1. To better understand the theoretical foundations of neuroscience
2. Define the molecular, cellular, and tissue-level organization of the central and peripheral nervous system
3. Understand the properties of cells that make up the nervous system including the propagation of electrical signals used for cellular communication
4. Relate the properties of individual cells to their function in organized neural circuits and systems
5. Understand how the interaction of cells and neural circuits leads to higher level activities such as cognition and behavior
6. Communicate effectively orally and in writing
7. Develop an understanding and appreciation of the interdisciplinary nature of neuroscience
8. Apply and integrate their knowledge of neuroscience to other areas of their studies and to their everyday life

Assignments: We expect to have four (4) homework assignments throughout the course in addition to a Mid-Term Test and a Final Exam. Term papers are given at the beginning of the class and submission will be on the due date, including oral presentation of the term paper. Home works in the form of individual assignments, and group assignments are organized and structured as preparation for the midterm and final exam, and are meant to be a studying material for both exams.

Grading: We will assign 20% of this class grade to homeworks, 10% for the mid-term test and 70% for the final exam. The Final exam is comprehensive.

Textbook: The recommended textbook for this course are as stated:

Title: *Ganong's Review of Medical Physiology*
Editors: K.E. Barrett, S.M. Barman, S. Biotano, and H.L. Brooks
Publisher: McGraw Hill
24th Edition
ISBN: 978-0-07-178004-9
Year: 2012

Title: *Essentials of Medical Physiology*
Authors: K. Sembulingam and PremaSembulingam
Publisher: Jaypee
6th edition
ISBN-978-93-5025-936-8
Year: 2012

Title: *Medical Biochemistry*
Editors: John W Baynes and Marek H Dominiczak
Publisher: Mosby Elsevier
3rd Edition
ISBN: 978-0-323-05371-6
Year: 2009

Courseware: - PHS 301 - Neurophysiology

The following documents outline the courseware for the course CSC 301- Neurophysiology. Much of this material is taken from recommended text books.

1. Introduction to Nervous System
    i. Neuron
    ii. Neuroglia
    iii. Review of Resting membrane and Action Potential
2. Synaptic &Junctional Transmission
    i. Functional Anatomy
    ii. Electrical Events in Postsynaptic Neurons
    iii. Inhibition & Facilitation at Synapses
    iv. Neuromuscular Transmission
    v. Denervation Supersensitivity
3. Neurotransmitters & Neuromodulators
    i. Chemical Transmission of Synaptic Activity
    ii. Small-Molecule Transmitters
    iii. Large-Molecule Transmitters: Neuropeptides
    iv. Other Chemical Transmitters
4. Somatosensory Neurotransmission: Touch, Pain, and Temperature

i. Sense Receptors & Sense Organs
ii. Generation of Impulses in Cutaneous Receptors
iii. Sensory Coding
iv. Pain
v. Somatosensory Pathways
vi. Modulation of Pain Transmission

5. Reþex and Voluntary Control of Posture & Movement
   i. General Properties of Reflexes
   ii. Monosynaptic Reflexes: The Stretch Reflex
   iii. Inverse Stretch Reflex
   iv. Polysynaptic Reflexes: The Withdrawal Reflex
   v. Spinal Integration of Reflexes
   vi. General Principles of Central Organization of Motor Pathways
   vii. Motor Cortex & Voluntary Movement
   viii. Control of Axial & Distal Muscles
   ix. Brain Stem Pathways Involved in Posture and Voluntary Movement
   x. Posture-Regulating Systems
   xi. Basal Ganglia
   xii. Cerebellum
6. Electrical Activity of The Brain, Sleepï Wake States, & Circadian Rhythms
   i. Thalamus, Cerebral Cortex, & Reticular Formation
   ii. Evoked Cortical Potentials
   iii. Physiologic Basis of the Electroencephalogram
   iv. Sleep-Wake Cycle: Alpha, Beta, & Gamma Rhythms
   v. Clinical Uses of the EEG
   vi. Circadian Rhythms & the Sleep-Wake Cycle
7. Learning, Memory, Language, & Speech
   i. Learning & Memory
   ii. Language & Speech