DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
PROGRAMME: B. TECH (Minor in Cognitive Science)
COURSE TITLE: Cognitive Neuroscience

Course Category: Minor Degree **Internal: 50 Marks**
Course Code: HSMCS 303 **Theory 50 Marks**
Credits 3 (L-03, T-00) **Total: 100 Marks**
Semester: 6th **Time: 3 Hrs.**

Course Objectives

This course provides an introductory overview of contemporary cognitive neuroscience methods and pivotal discoveries. It comprehensively explores foundational concepts, including sensory perception, memory, emotion, and consciousness.

Instructions for Examiner

The number of questions to be set will be five, at least one from each unit. The examinees will be required to attempt all five questions. All questions shall carry equal marks.

Unit I: History and Methods

A Historical Perspective, Instruments of neuroscience, EEG, PET, MRI, fMRI. Structure and function of the nervous System. Cognitive psychology and behavioral methods. Studying the damaged brain, Methods to perturb neural function, Structural analysis of the brain.

Unit II: Sensation and Perception

Sensation, Early perceptual processing, Shared processing fromacquisition to anatomy. Audition, Neural pathways of audition. Vision, Neural pathways of vision, Cortical visual areas. From Sensation to Perception, Where perception are formed? Individual differences in perception, Multimodal perception.

Unit III: Emotion and Memory

What is emotion, Neural systems involved in emotion processing, Limbic system. Emerging concepts of emotional networks, Categorizing emotions,Amygdala, Influence of emotion on learning. Anatomy of memory, Amnesia, Brain surgery and memory loss. Mechanisms of memory, Short-term forms of memory, Long-term forms of memory.

Unit IV: Consciousness

Conscious versus unconscious processing, Extent of subconscious processing, Gaining access to consciousness sentience, Neurons, Neuronal groups, and conscious experience, Isconsciousness a uniquely human experience?

Course Outcomes

By course completion, students will proficiently identify neural substrates associated with diverse cognitive functions and discern their impacts on social cognition and consciousness.

Suggested Readings

1. M.S. Gazzaniga, R.B. Ivry, and G.R. Mangun (2019). *Cognitive Neuroscience: The Biology of the Mind*. W.W. Norton. ISBN:9780393603170.
2. Epstein, R. A., Patai, E. Z., Julian, J. B., & Spiers, H. J. (2017). *The cognitive map in humans: spatial navigation and beyond*. Nature neuroscience, *20*(11), 1504-1513.
3. Gazzaniga, M. S. (2004). *The cognitive neurosciences*. MIT press.
4. Baars, B., & Gage, N. M. (2013). *Fundamentals of cognitive neuroscience: a beginner's guide*. Academic Press.