

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

Course Category: Minor Degree

Course Code: HSMCS 301

Credits 3 (L-03, T-00)

Semester: 5th

Course Objectives

This course is aimed at introducing the students to the fundamentals of cognitive science, i.e. the study of the mind. The course begins with the origins of the field and goes on to familiarize students with its interdisciplinary perspectives on how the mind is organized and processes information.

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 of Cognitive Science

The prehistory of cognitive science, Reaction against behaviorism in psychology, Theory of computation and the idea of an algorithm. Information-processing models in psychology, Cognitive systems as functional systems, Extending computational modeling to the brain.

Unit II: Integration Challenge

Cognitive science: An interdisciplinary endeavor, Levels of explanation. The contrast between psychology and neuroscience, How psychology is organized? How neuroscience is organized? The integration challenge. Neural activity and the BOLD signal.

Unit III: Information Processing Model of Mind

Physical symbol systems and the language of thought, Physical symbol system hypothesis, From physical symbol systems to the language of thought. The computer model of the mind and the relation between syntax and semantics, The Chinese room argument. Neurally inspired models of information processing and cognitive processes.

Unit IV: Cognitive Process

How are cognitive systems organized? Architectures for intelligent agents, Modularity and cognitive science. Strategies for brain mapping, Structure, and function in the brain, Exploring anatomical connectivity. Studying cognitive functioning: Techniques from neuroscience, From data to maps: Problems and pitfalls

Course Outcomes

At the end of the course, students will be able to gain a deeper understanding of the core concepts and principles of Cognitive Science.

Suggested Readings

1. Bermúdez, J. L. (2014). *Cognitive science: An introduction to the science of the mind*. Cambridge University Press.
2. Butz, M. V., & Kutter, E. F. (2016). *How the mind comes into being: Introducing cognitive science from a functional and computational perspective*. Oxford University Press.
3. Grossberg, S. (2021). *Conscious mind, resonant brain: how each brain makes a mind?* Oxford University Press.
4. Thagard, P. (2005). *Mind: Introduction to cognitive science*. MIT press.