SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

(Established under section 3 of the UGC Act, 1956)
Re-accredited by NAAC with 'A++' Grade | Awarded Category – I by UGC
Founder: Prof. Dr. S. B. Mujumdar, M. Sc., Ph. D. (Awarded Padma Bhushan and Padma Shri by President of India)

Course Name: Cognitive Systems
Course Code: TE7548
Faculty: Engineering
Course Credit: 3
Course Level: 4
Sub-Committee (Specialization): Artificial Intelligence and Machine Learning
Learning Objectives:

Students will be able to

Identify key concepts in cognitive systems and its relevance in AI field.
Explore and correlate different theories in cognitive science domain.
Identify knowledge representation and modelling techniques in cognitive science.
Illustrate real-time applications with respect to cognitive science.

Books Recommended:

Book	Author	Publisher
Cognitive linguistics: an introduction	Evans, Vyvyan and Melanie Green	Routledge, 2006
The MIT Encyclopedia of the Cognitive Sciences (MITECS)	Wilson, Robert A., & Keil, Frank C. (eds.)	MIT Press, 2001

Course Outline:

Sr. No.	Topic	Actual Teaching Hours	Contact Hours Equivalence
1	**Introduction to Cognitive Systems: Basics, introduction to computational theories of human cognition, drawing on formal models from classic and contemporary artificial intelligence approaches to cognition, philosophy of cognition, fundamental issues in human knowledge representation, inductive learning and reasoning, forms of knowledge, the inductive principles, computation of cognitive functioning in Machines, Human-robotics interaction, difference between AI and Cognitive systems, Computational intelligence techniques, cognitive linguistics.**	15	15
2	**Cognitive science :Concept Learning and Categorization, Reasoning about Natural Kinds, Learning Causal Relations, The Structure and Formation of Intuitive Theories of Physical, Biological and Social Systems, The Acquisition of Natural Language (syntax and semantics), Theory of Mind: How we Understand the Behavior and Mental States of Other People**	12	12
3	**Formal modeling: Bayesian Inference and Hierarchical Bayesian Models, Frameworks for Knowledge Representation: First-order Logic, Formal Grammars, Associative Networks, Taxonomic Hierarchies, Relational Schemas, Probabilistic and Causal Graphical Models, Relational Probabilistic Models, Controlling Complexity: Minimum Description Length, Bayesian Occam's Razor, Nonparametric Bayesian Models Inductive Logic Programming, Sampling Algorithms for Inference in Complex Probabilistic Models**	10	10
4	**Applications: Speech recognition, sentiment analysis, face detection, risk assessment, and fraud detection.**	8	8
	Total	45	45

Pre Requisites:

Probability or statistics

Evaluation:

A) Continuous Assessment (30 marks)

1. Essential

a) Quizzes b) Assignments c) Tests

Pedagogy:

Hands on Lab exercises

Online demos

Project-based learning

Expert:

Dr. Shraddha Phansalkar,HOD, CS/IT department,SIT