

Cognition and Cognitive System

1.1 Course Number: CS368

1.2 Contact Hours: 3-0-0 Credits: 9

1.3 Semester-offered: 3rd Year-Even

1.4 Prerequisite: NA

1.5 Syllabus Committee Member: Dr. Sushum Biswas, Dr. Daya Sagar Gupta & Dr. Gargi Srivastava

2. **Objective:** - The course enables the students learn the design of computer simulation and mathematical models of human cognition and perception.

3. **Course Content:**

Unit-wise distribution of content and number of lectures

Unit	Topics	Sub-topic	Lectures
1	Introduction	Human Brain: Introduction, cognitive faculties: memory, attention, vision and language, What is cognition, introduction about approaches to cognition, theories of mind: mind - body dualism, materialist theory of mind, identity theory of mind, computational theory of mind.	8
2	Consciousness and Free Will	First person approach , third person approach, Chalmers view of consciousness, problem of third person approach, Pattern-Information duality, Sloman view, free will as continuous dimension, design distinctions for agent modeling.	8
3	AI Debates I	Is AI possible? Pro: Roger Penrose, moravec, Herbert Simon. Artificial mind via symbolic AI, Turing test of AI. Against: Dreyfus five stages of learning, Searle's chinese room thought experiment, Degrees of understanding, godel's incompleteness theorem	8
4	AI Debates II	Connectionist Model, Objectives of Connectionist model, Feldman's hundred step rules, Brain vs computer model of mind, Lloyd's cautions, Fodor's attack, Chamblers' defense, Rule based AI.	8
5	Cognitive Architectures	ACT-R, CLARION, SOAR, Reinforcement Learning, Distributed Cognition, Learning and Memory Architectures	8
		Total	40

4. **Readings**

4.1 Textbook:

1. *Artificial Mind by Stan Franklin*
2. *Research Papers*

4.2 Reference books:

1. *Siegelbaum, Steven A., and A. J. Hudspeth. Principles of neural science. Eds. Eric R. Kandel, James H. Schwartz, and Thomas M. Jessell. Vol. 4. New York: McGraw-hill, 2000.*

- 5 **Outcome of the Course:** Students will get the understanding of how human cognition works as per the explanations till date. Students will get new side of AI development(Using cognitive architectures). Students will get to know the challenges which have been accomplished and which is yet to be addressed to make true AI systems.