

Cognitive Computing	3	0	2	Artificial Intelligence and Machine learning
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**Course Objective::** Define cognitive computing and elucidate its core components. Investigate machine learning techniques applied in cognitive systems. Learn computer vision for cognitive systems, speech recognition, and audio processing, and learn how to integrate sensor data for enhanced cognitive capabilities.

S. NO	Course Outcomes (CO)
CO1	Understand the concepts of Cognitive models and their architectures.
CO2	Apply and analyze various machine learning algorithms in cognitive computing.
CO3	Examine and integrate sensor data in Cognitive computing.
CO4	Demonstrate the cognitive computing concepts to practical scenarios.

S. NO	Contents	Contact Hours
UNIT 1	Introduction to Cognitive Computing: Definition and Evolution of Cognitive Computing KeyComponents: AI, Machine Learning, Natural Language Processing Historical Perspectives and Milestones in Cognitive Computing Cognitive Models and Architectures: Overview of Cognitive Architectures Connectionist Models: Neural Networks and Deep Learning Symbolic Models: Rule-Based Systems and Expert Systems	8
UNIT 2	Cognitive Computing Algorithms: Machine Learning for Cognitive Systems ReinforcementLearning in Cognitive Computing Evolutionary Algorithms and Swarm Intelligence Natural Language Processing (NLP) in Cognitive Computing: Basics of Natural Language Processing NLP for Understanding and Generating Human-Like Text Sentiment Analysis andLanguage Models	6
UNIT 3	Perception and Sensing: Computer Vision in Cognitive Computing Speech Recognition and Audio processing Integrating Sensor Data for Cognitive Systems	6
UNIT 4	Human-Computer Interaction (HCI) in Cognitive Computing: Principles of HCI Designing User Interfaces for Cognitive Systems Multimodal Interaction: Combining Voice, Gesture, and Touch	7

<b>UNIT 5</b>	Cognitive Applications in Industry: Healthcare and Cognitive Computing Finance and Cognitive Analytics Smart Cities and Cognitive Technologies Ethical and Social Implications of Cognitive Computing: Privacy Concerns in Cognitive Systems Bias and Fairness in Cognitive Algorithms Ethical Design and Responsible AI	<b>9</b>
	<b>TOTAL</b>	<b>42</b>

<b>REFERENCES</b>		
<b>S.No.</b>	<b>Name of Books/Authors/Publishers</b>	<b>Year of Publication / Reprint</b>
<b>1</b>	Michael Negnevitsky , “Cognitive Computing: A Practical Guide”, Pearson	2019
<b>2</b>	Vint Cerf and Peter Fingar, “Cognitive Computing: A Brief Guide for Game Changers” Meghan Kiffer Pr	2015
<b>3</b>	Shahram Ebadollahi, Kathleen McKeown and Ronnie Mitra, “Cognitive Computing and the Future of Health Care”, IBM Redbooks	2016

<b>B.Tech. Information Technology</b>				
<b>Course code: Course Title</b>	<b>Course Structure</b>			<b>Pre-Requisite</b>
	<b>I</b>	<b>T</b>	<b>P</b>	Electronics, sensors, deep