Course Title : Artificial Intelligence			
Course Code : P18CS553	Semester : 5	L :T:P : 2:2:0	Credits: 3
Contact Period: Lecture: 52 Hrs, Exam: 3 Hrs		Weightage: CIE:50%, SEE:50%	

Course Content
Unit-1
Introduction -The Foundations of Artificial Intelligence, The History of Artificial Intelligence, The State of the Art;
Intelligent Agents -Agents and Environments,Good Behavior: The Concept of Rationality, The Nature of Environments, The Structure of Agents;
Solving problem by searching -Problem-Solving Agents, Searching for Solutions, Uninformed Search Strategies, Informed (Heuristic) Search Strategies, Heuristic Functions;
Adversarial Search-Alpha – Beta Pruning.
Self Study Component**:** Solving problem by searching - Example Problems

12 Hours

Unit-2
Logical Agents - Knowledge-Based Agents, The Wumpus World, Logic, Propositional Logic: A Very Simple Logic;
First-Order Logic - Syntax and Semantics of First-Order Logic, Using First-Order Logic, Knowledge Engineering in First-Order Logic;
Inference in First-Order Logic - Unification and Lifting, Forward Chaining, Backward Chaining, Resolution.
Self-Study Component: Inference in First-Order Logic **-** Propositional vs. First-Order Inference.
10 Hours

Unit-3
Quantifying Uncertainty - Acting under Uncertainty, Basic Probability Notation, Inference Using Full Joint Distributions, Independence, Bayes' Rule and Its Use;
Probabilistic Reasoning - Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks, Efficient Representation of Conditional Distributions, Exact Inference in Bayesian Networks, Approximate Inference in Bayesian Networks, Relational and First-Order Probability Models;
Probabilistic Reasoning over Time – Hidden Markov Models
Self-Study Component: Probabilistic Reasoning –Other Approaches to Uncertain Reasoning

10 Hours

Unit-4
Learning from Examples – Forms of Learning, Supervised Learning, Learning Decision Trees, Evaluating and Choosing the Best Hypothesis, The Theory of Learning, Regression and Classification with Linear Models, Artificial Neural Networks, Nonparametric Models, Support Vector Machines, Ensemble Learning.
Self-Study Component: Learning from Examples – Practical Machine Learning

10 Hours

Unit-5
Knowledge in Learning – A Logical Formulation of Learning, Knowledge in Learning, Explanation-Based Learning, Learning Using Relevance Information, Inductive Logic Programming;

Learning Probabilistic Models – Statistical Learning, Learning with Complete Data, Learning with Hidden Variables: The EM Algorithm;

Reinforcement Learning-Passive Reinforcement Learning, Active Reinforcement Learning, Generalization in Reinforcement Learning, Policy Search.

Self-Study Component: Reinforcement Learning **-** Applications of Reinforcement Learning

10 Hours

Text Book :
1. Artificial Intelligence : A Modern Approach, Stuart Russell and Peter Norvig, Prentice Hall, 3rd edition, 2009

Reference Book :
1. Artificial Intelligence : Structures and Strategies for complex problem solving, George F Luger, Pearson Addison Wesley, 6th edition 2008.
2. Demonstrate Natural Language Processing and its application in Natural Language Communication

Course outcomes: At the end of the course the student will be able to:
1. Define Artificial intelligence and identify problems for AI. Characterize the search techniques to solve problems and recognize the scope of classical search techniques
2. Define knowledge and its role in AI. Demonstrate the use of Logic in solving AI problems.
3. Demonstrate handling of uncertain knowledge and reasoning in probability theory.
4. Explain Learning methods in AI
5. Explain Knowledge Learning, probabilistic models and reinforcement learning in AI

Course Articulation Matrix(CAM)														
Course Outcomes (CO's)	**Program Outcomes(PO's)**												**PSO's**	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
CO – 1	2	2	2	1										2
CO – 2	2	2	2	2										1
CO – 3	2	2	2	2										2
CO – 4	2	2	2	1										2
CO – 5	2	2	2	2										2