Course code: Course Title	Course Structure			Pre-Requisite
	L	T	P	Discrete mathematics, Programming, Probability & Graph Theory
SE323: Artificial Intelligence	3	0	2	

Course Objective: To introduce basic Knowledge representation, problem solving, and learning methods of Artificial Intelligence and understand the role of knowledge representation, problem solving, and learning in intelligent system engineering.

S. NO	Course Outcomes (CO)
CO1	Understand the foundation and scope of Artificial Intelligence (AI).
CO2	Apply problem-solving methods, heuristic search techniques, and evolutionary algorithms to address AI-related challenges.
CO3	Explore and implement game playing algorithms, predicate logic and its applications to understand knowledge representation.
CO4	Implement reasoning techniques and neural network based systems.
CO5	Analyze AI applications such as expert systems, natural language processing, robotics, and computer vision using appropriate AI techniques.

S. NO	Contents	Contact Hours
UNIT 1	**Introduction**: AI Problems, Task Domains of AI, AI Techniques: search knowledge, abstraction. Introduction to Intelligent program and Intelligent agents. Problem Solving: Basic Problem solving Method: state space search, problem characteristics, Production systems characteristics, issues in design of Intelligent search algorithm.	6
UNIT 2	**Heuristic search Techniques**: Hill climbing techniques, Best First search, A* Search, Problem Reduction: AO* Search, Constraint Satisfaction, Means-End Analysis. **Game Playing**: Game Tree, Searching procedure Minimax, alpha-beta pruning.	7
UNIT 3	**Knowledge Representation**: Knowledge Representation issues. Knowledge Representation using Predicate Logic: Unification, resolution. **Rule based Systems:** Forward versus backward reasoning, conflict resolution. **Structured Knowledge Representation**: Semantic Nets, Frames, conceptual dependency, scripts.	7
UNIT 4	**Programming Languages**: Fundamental and concepts of Programming languages like Prolog or Lisp. Relationship of languages with Knowledge representation and inferences.	6
UNIT 5	**Reasoning**: Handling uncertainty Non-Monotonic Reasoning, Probabilistic reasoning, use of certainty factors, fuzzy logic. Learning Concept of learning, learning automation, genetic algorithm, learning by inductions, neural nets.	8
UNIT 6	**Applications:** Expert Systems: Architecture, Domain Knowledge, Knowledge Acquisition, Case Studies: MYCIN, RI, Natural language Processing: Syntactic, Semantic and Pragmatic Analysis, Robotics etc.	8

	TOTAL	42

REFERENCES		
S.No.	**Name of Books/Authors/Publishers**	**Year of Publication / Reprint**
1	Elaine Rich, Kevin Knight, Shivashankar B. Nair, "Artificial Intelligence", McGraw Hill Education, 3rd Edition.	**2017**
2	Nils J. Nilsson, "Principles of Artificial Intelligence", Reprint edition, Morgan Kaufmann Publishers In.	**1993**
3	LiMin Fu, "Neural Networks in Computer Intelligence", McGraw Hill Education, 1st Edition.	**2003**
4	George Luger, "Artificial Intelligence: Structures and Strategies for Complex Problem Solving", Pearson, 6th Edition.	**2008**
5	Michael Negnevitsky, "Artificial Intelligence: A Guide to Intelligent Systems", Pearson Education, 3rd Edition.	**2020**
6	Dan W. Patterson, "Introduction to Artificial Intelligence and Expert Systems", Pearson Education India, 1st Edition.	**2015**