Artificial Intelligence

CS-3011

Lecture & Tutorial:	3 Hrs/Week	**Internal Assessment Marks:**	50
		End Term Marks:	50
Practical:	0	**Credits:**	3

Course Objectives:

CO1: To have a basic idea of Artificial Intelligence (AI) by broadly understanding its definitions, foundations, history of its developments and current state of the art real world applications.

CO2: To have the knowledge of AI from a rational agent approach by understanding the PEAS specifications of the task environments, types of environments and types of agent structures.

CO3: To gain understanding of search-based problem-solving agents by knowing the importance of various search strategies, both uninformed and informed.

CO4: To gain idea of local search algorithms, optimization problems, sensor-less problems and exploration problems

CO5: To understand Adversarial Search and Constraint Satisfaction Problems (CSP)

CO6: To gain idea of hybrid logical agents, Propositional Logic, First-Order Logic, Forward Chaining and Backward Chaining and Planning problems.

Module no. & Name	Topic/Coverage	No. of lectures	Lecture Serial no.
1. Introduction	1. What is AI? 2. The foundations of AI 3. The history of AI 4. The State of the Art 5. ***Tutorial - 1***	4	1-4
2. Intelligent Agents	1. Agents & Environments 2.The good behavior: The concept of rationality 3.The nature of Environments 4.The Structure of Agents 5. ***Tutorial - 2*** & **Activity-1**	6	5-10
3. Solving Problems by Searching	1. Problem Solving Agents 2. Example Problems 3. Searching for Solutions 4. Uninformed Search Strategies 5. Avoiding repeated states 6. Searching with partial information 7. ***Tutorial - 3*** & **Activity-2**	8	11-18
4. Informed Search & Exploration	1. Informed Search Strategies 2. Heuristic functions 3. ***Tutorial - 4***	5	19-23
	MID SEMESTER EXAM		

	3. Local search algorithms & optimization problems 4. Local search in continuous spaces 5.Online search agents & unknown environments 6.***Tutorial - 5*** & **Activity-3**	5	24-28
5. Constraint Satisfaction Problems	1. Constraint Satisfaction Problems (Backtracking searching for CSPs etc.) 2. ***Tutorial - 6***	3	29-31
6. Adversarial Search	1. Adversarial Search (Games, Optimal decision in games etc.) 2. ***Tutorial - 7*** & **Activity-4**	4	32-35
7. Logical Agents	1. Logical Agents (Knowledge-based agents, the Wumpus World etc.) 2. ***Tutorial - 8***	5	36-40
8. First-Order Logic and its Inference	1. First-order Logic and its inference (Syntax and semantics of First-Order Logic, Propositional vs First-Order Inference etc.) 2. ***Tutorial - 9***	4	41-44
9. Planning	1. Planning (The planning problem, Planning with state-space approach etc.) 2. ***Tutorial – 10*** & **Activity-5**	3	45-47
	END SEMESTER EXAM		

Text Books:

1. Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig, Pearson Education

Reference Books:

1. Artificial Intelligence, Rich, Knight and Nair, Tata McGraw Hill.
2. Principles of Artificial Intelligence, Nils J. Nilsson, Elsevier, 1980.

Evaluation Scheme:

Activities:[Quiz, Assignment]	30 Marks
Mid Semester:	20 Marks
End Semester:	50 Marks
Total	100 Marks