

CSE11112	Introduction to Artificial Intelligence	L	T	P	C
Version 1.0	Contact Hours 45	3	0	0	3
Pre-requisite/Exposure	Fundamentals of computer science, Operating system				
Co-requisite	NIL				

Course Objectives:

- To provide the most fundamental knowledge of AI.
- To make a computer that can learn, plan, and solve problems autonomously.
- To give the students a perspective on the main research topics in AI i.e. problem solving, reasoning, planning, etc.
- To enable students to acquire knowledge on some basic search algorithms for problem solving; knowledge representation and reasoning; pattern recognition; fuzzy logic; and neural networks.

Course Outcomes:

On the completion of this course the student will be able to CO1: Define Artificial Intelligence and its approach.

CO2: Describe propositional logic and inference engine. **CO3:** Execute Planning with state-space search.

CO4: Construct Bayesian networks and other temporal models. **CO5:** Explain the types of Learning.

Course Description:

Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. The main research topics in AI include: problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming, machine learning, and so on. Of course, these topics are closely related with each other. For example, the knowledge acquired through learning can be used both for problem solving and for reasoning. In fact, the skill for problem solving itself should be acquired through learning. Also, methods for problem solving are useful both for reasoning and planning. Further, both natural language understanding and computer vision can be solved using methods developed in the field of pattern recognition. In this course, we will study the most fundamental knowledge for understanding AI. We will introduce some basic search algorithms for problem solving; knowledge representation and reasoning; pattern recognition; fuzzy logic; and neural networks.

Course Content:

Units	Lecture Hours
Unit-I: Introduction: Introduction, Agents, Problem formulation, Forward and backward chaining, Unification, Resolution.	10
Unit-II: Search in State Space and Planning: Uninformed search strategies, Heuristics, Informed search strategies, Satisfying constraints. Planning with state-space search, Partial-order planning, planning graphs, Planning and acting in the real world, Forward and backward chaining, Unification, Resolution.	8
Unit-III: Knowledge Representation & Reasoning: Introduction & Overview, Logical agents, Propositional logic, Inference rules, First-order logic, Inferences in first order logic, Ontology Engineering, knowledge representation	9
Unit-IV: Uncertainty Quantifying Uncertainty, Probabilistic Reasoning, Probabilistic Reasoning over Time ,Probabilistic Programming,Making Simple Decisions, Making Complex Decisions ,Multiagent Decision Making	9
Unit-V: Various wings of AI: Introduction to various wings of AI Neurophysiology, cognitive science, pattern recognition, machine learning,machine vision, linguistics, data science, robotics, bioinformatics, speech processing, generative systems.	9

Relationship between Course Outcomes (COs) and Program Outcomes (POs):

Course Code	Course Name	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CSE11	Introduc	CO111	3	3	3	2	2	1	1	-	1	-	-	1	3	3	2
112	tion to	12.1															
	Artificial	CO111	1	3	3	3	2	3	1	-	2	-	-	1	3	1	2
	Intellige	12.2															
	nce	CO111	3	2	3	2	1	3	2	-	1	-	-	2	3	3	1
		12.3															
		CO111	3	3	3	3	3	3	2	-	3	-	-	1	3	1	2
		12.4															
		CO111	3	1	3	3	3	1	2	-	1	-	-	3	3	3	1
		12.5															
		CO111	2.	2.	3.	2.	2.	2.	1.	-	1.	-	-	1.6	3.0	2.2	1.6
		12	6	4	0	6	2	2	6		6						