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:

1. To provide the most fundamental knowledge of AI.
2. To make a computer that can learn, plan, and solve problems autonomously.
3. To give the students a perspective on the main research topics in AI i.e. problem solving, reasoning, planning, etc.
4. To enable students to acquire knowledge on some basic search algorithms for problem solving; knowledgerepresentation 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 areuseful 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 fundamentalknowledge 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:

Unit-I	10 Lecture Hours
Introduction: Introduction, Agents, Problem formulation, Forward and backward chaining, Unification, Resolution.	
Unit-II	**8 Lecture Hours**
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.	
Unit-III	**9 Lecture Hours**
Knowledge Representation & Reasoning: Introduction & Overview, Logical agents, Propositional logic, Inference rules, First-order logic, Inferences in first order logic, Ontology Engineering, knowledge representation	
Unit-IV	**9 Lecture Hours**
Uncertainty Quantifying Uncertainty, Probabilistic Reasoning, Probabilistic Reasoning over Time ,Probabilistic Programming, Making Simple Decisions, Making Complex Decisions ,Multiagent Decision Making	
Unit-V	**9 Lecture Hours**
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.	
Text Books: 1.Artificial Intelligence – A Modern Approach, Second Edition, S. Russel and P. Norvig Pearson Education, 2003. 2.Machine Learning, 1st Edition, Tom M. Mitchell, McGraw-Hill Series. In Computer Science 3.Neural Networks and Learning Machines, 3rd Edition, Simon O. Haykin, Prentice Hall 4.Introduction to Machine Learning, 2nd Edition, Ethem Alpaydın, The MIT Press **Reference Books:** 1.Computational Intelligence: a logical approach", David Poole, Alan Mack worth, Randy Goebel, First edition; Oxford University Press, 2004 2.Artificial Intelligence: Structures and Strategies for complex problem solving", Fourth Edition, G. Luger, Pearson Education, 2002. 3.Minsky, Marvin. "Society of Mind: a response to four reviews." Artificial Intelligence 48.3 (1991): 371-396.	

Modes of Evaluation: Quiz/Assignment/Presentation/Extempore/ Written Examination

Examination Scheme:

Components	Mid Term	Class Assessment	End Term
Weightage (%)	20	30	50

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

Mapping between COs and POs		
Course Outcomes (COs)		Mapped Program Outcomes
CO1	**Define** Artificial Intelligence and its approach.	PO1, PO2, PSO1
CO2	**Describe** propositional logic and inference engine.	PO2, PO3, PO4, PSO1
CO3	**Execute** Planning with state-space search.	PO1, PO2, PO4, PSO2
CO4	**Construct** Bayesian networks and other temporal models.	PO2, PO3, PO4, PO5, PO6, PSO3
CO5	**Explain** the types of Learning.	PO3, PO5, PSO3

Course Code	Course Title	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
		Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Adequate strong skills in learning new programming environments, analyse and design algorithms for efficient computer-based systems of varying	The ability to understand the evolutionary changes in computing, apply standard practices and strategies in software project development using open-	Ability to analyse the impact of Computer Science and Engineering solutions in the societal and human context, design, model, develop, test and manage
CSE 11112	Introduction to Artificial Intelligence	2	3	2	3	2	1	-	-	-	-	-	-	2	1	1