

Branch Name:	Bachelor of Science (Information Technology)
Program Code:	ET110
Semester/Year:	Semester - V/ Third Year
Subject Title:	Introduction to Artificial Intelligence
Subject Code:	1ET1100501
Pre-requisite:	Logic, Calculus, Linear Algebra, and Statistics

Course Objective:

- To gain a basic idea of AI and AI related problem solving, inference, perception, knowledge representation, and learning.
- To know about the Heuristic search techniques and about knowledge representation in AI.
- To know about Predicate Logic and about Reasoning in AI.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
03	01	02	05	70	30	30	20	150

Subject Contents

Sr. No	Topic	Total Hours	Weight (%)
1	Introduction to Artificial Intelligence: The AI Problems, AI Techniques, Underlying Assumption, Level of the Model, Criteria of Success, Some General References.	2	10
2	State Space Search: Problems, Problem Spaces, and Search: Defining the Problem as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – Issues in the Design of Search Programs. Heuristic Search Techniques : Generate and Test – Hill Climbing – Best-First Search – Problem Reduction – Constraint Satisfaction – Means-ends Analysis. Knowledge Representation Issues: Representations and Mappings – Approaches to Knowledge Representation – Issues in Knowledge Representation – The Frame Problem.	10	30
3	Using Predicate Logic: Representing Simple Facts in Logic – Representing Instance and ISA Relationships – Computable Functions and Predicates – Resolution – Natural Deduction - Representing Knowledge Using Rules: Procedural Versus Declarative Knowledge – Logic Programming – Forward Versus	10	25

	Backward Reasoning – Matching – Control Knowledge.		
4	Symbolic Reasoning Under Uncertainty: Introduction to Non-monotonic Reasoning – Logics for Non-monotonic Reasoning – Implementation Issues – Augmenting a Problem-solver – Implementation Depth First Search – Implementation Breadth First Search. Statistical Reasoning: Probability and Baye's Theorem – Certainty Factors and Rule- based Systems – Bayesian Networks – Dempster-Shafer Theory – Fuzzy Logic	8	20
5	Semantic Nets- Frames: Conceptual Dependency – Scripts – CYC. - Syntactic Semantic Spectrum of Representation – Logic and Slot-and-Filler Structures – Other Representational Techniques.	8	15

List of Reference Books:

1. Kevin Night, Elaine Rich, and Nair B., “Artificial Intelligence”, McGraw Hill, 2017
2. M. Tim Jones, - Artificial Intelligence: A Systems Approach (Computer Science), Jones and Bartlett Publishers Inc.; First Edition, 2008.
3. Nils J. Nilsson, - The Quest for Artificial Intelligence, Cambridge University Press, 2009.
4. Gerhard Welss, - Multi Agents Systems, Second Edition, 2013
5. David L. Poole and Alan K. Mackworth, - Artificial Intelligence: Foundations of Computational Agents, Cambridge University Press, 2010.
6. Dan W. Patterson, “Introduction to AI and ES”, PearsonEducation, 2007

List of Suggested titles of Experiments:

1. Write a program to implement the Hill Climbing problem.
2. Write a program to implement the Towers of Hanoi problem.
3. Write a program to implement the Missionaries and Cannibals problem.
4. Write a program to implement the 8 queen's problem.
5. Write a program to implement the A* Algorithm.
6. Write a program to implement the Breadth first algorithm.
7. Write a program to implement the Depth first algorithm.
8. Write a program to implement the predicate logic.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	To understand the basic idea of artificial intelligence and its application areas.	1 Remembering 2. Understanding
CLO2	To apply basic principles of AI in solutions that requires problem solving, inference, perception, knowledge representation, and learning.	2 Understanding 3 Applying
CLO3	To demonstrate awareness and a fundamental understanding of various applications of AI techniques.	2 Understanding 3 Applying
CLO4	To understand about Logic programming and about Reasoning related to AI.	2 Understanding 3 Applying 5 Evaluate
CLO5	To know about the different representational techniques in AI.	2. Understanding 3 Applying

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	PSO 4
CLO1	H	H	H	M	M	M							L	M	H	M
CLO2	H	H	M	H	M	M							H	M	L	M
CLO3	M	H	L	M	M	M							M	M	L	M
CLO4	H	M	M	L	M	L							M	M	L	M
CLO5	H	M	H	M	H	M							H	M	L	H

H: High, M: Medium, L: Low