

Course Code	PCA20D07J	Course Name	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	Course Category	D	Discipline Elective Course	L	T	P	C
							3	0	2	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)
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CLR-1 :	Gain knowledge about Artificial Intelligence(AI) and Heuristic search technique	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	Gain knowledge about Knowledge representations and Predicate logic																		
CLR-3 :	Understand Machine Learning and concept learning, Develop a Learning System																		
CLR-4 :	Understand and Apply real time problem using Artificial Intelligence Understand and Apply Machine Learning in Gaming development																		
CLR-5 :	Practice the Machine Learning Models																		
CLR-6 :	Understand the Decision tree and , Neural Network and Genetic algorithm																		

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Disciplinary Knowledge	Critical Thinking	Problem Solving	Analytical Reasoning	Research Skills	Team Work	Scientific Reasoning	Reflective Thinking	Self-Directed Learning	Multicultural Competence	Ethical Reasoning	Community Engagement	ICT Skills	Leadership Skills	Life Long Learning
CLO-1 :	Gain knowledge about Artificial Intelligence and Heuristic search technique	2	85	80	L	H	H	H	H	M	-	H	M	H	-	H	-	-	-
CLO-2 :	Gain knowledge about Knowledge representations and Predicate logic	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-3 :	Understand Machine Learning and concept learning, Develop a Learning System	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-4 :	Understand and Apply real time problem using Artificial Intelligence Understand and Apply Machine Learning in Gaming development	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-5 :	Understand the Decision tree and , Neural Network and Genetic algorithm	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-6 :	Practice the Machine Learning Models	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-

Duration(hour)	15	15	15	15	15
S-1	SLO-1	Definitions	Knowledge representations	Learning	Learning with Trees
S-2	SLO-1	History of Artificial Intelligence	Representation and Mapping	Types of Machine Learning	Basic Decision tree algorithm
S-3	SLO-1	AI Problems and AI Techniques	Approaches in Knowledge representations	Supervised Learning	Hypothesis space search

	SLO-2	Demonstration of water Jug problem	Explanations of different types of Knowledge	Perspectives and Issues in Machine Learning	Decision tree and Inductive Bias	Application of Neural Network using ppt
S-4 to S-5	SLO-1	Lab 1 : Simple AI Techniques implementation	Lab : 4 Knowledge implementation	Lab : 7 Concept Learning task	Lab : 10 Decision tree implementation	Lab : 13 Neural Network model implementation
S-6	SLO-1	Production System Characteristics	Predicate logic	Concept Learning as a search	Unsupervised Learning	Perceptron and Multi-layer perceptron
S-7	SLO-1	Game Planning	First order Predicate Logic (FOPL)	Reinforcement Learning	Clustering techniques	Convergence and local minima
S-8	SLO-1	Heuristic Search Techniques	Representing Knowledge using Rules	Importance of Reinforcement Learning	K- Means algorithm	Activation functions and Sigmoid functions
S-9 to S-10	SLO-1	Lab 2 : Implementation of Tic-Tac-Toe Game and Travelling Sales man problem	Lab : 5 Implementations of FOPL and Rules	Lab : 8 Design a Learning System	Lab : 11 Implementation of Decision tree and K- Mean algorithm	Lab : 14 Implementation of Multi-layer neural network
S-11	SLO-1	Revolutions of AI	Knowledge Acquisition	Candidate Elimination Algorithm	ID3 algorithm	Backpropagation algorithm
S-12	SLO-1	Intelligent Agents	Ontology	Hypothesis space Version space	Entropy calculation	Feed Forward Neural Network
S-13	SLO-1	Demonstrations of AI real-time examples	Syntax and semantic of FOL	Mushroom dataset	Measure Information gain	Genetic algorithm
S14-S 15	SLO-1	Lab 3 : Implementation of intelligent agents	Lab : 6 Implementation of Ontology and FOL	Lab : 9 Implementation of candidate elimination algorithm	Lab : 12 Implementation of ID3 algorithm	Lab : 15 Applying Backpropagation and genetic algorithm

Learning Resources	<p>1. Rich Elaine & Kevin Knight – Artificial Intelligence – Tata McGraw Hill - 1993</p> <p>2. Machine Learning. Tom Mitchell. First Edition, McGraw- Hill, 1997. (Chapters : 1, 2, 3, 4, 8 and 9)</p> <p>3. Peter Flach, – Machine Learning: The Art and Science of Algorithms that Make Sense of Data, First Edition, Cambridge University Press, 2012.</p> <p>4. Stephen Marsland, – Machine Learning –An Algorithmic Perspective, Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.</p>
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Learning Assessment											
Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%) #			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
	Understand										
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
	Analyze										
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

CLA – 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc ,

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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