

Branch Name:	Artificial Intelligence & Data Science
Program Code:	ET108
Semester/Year:	Semester VI/ Third Year
Course Name:	Artificial Intelligence and Machine Learning (Open Elective-I)
Course Code:	2ET1080681T
Pre-requisite:	Knowledge of Programming, Algorithms, Data Structures

Course Objectives:

1. The field of AI and its techniques are being used in many areas which directly affect human life. Various techniques for encoding knowledge in computer systems such as Predicate Logic, Production rules, Semantic networks find application in real world problems.
2. The fields of AI such as Game Playing, Natural Language Processing, and Connectionist Models are also important. Student should know some programming language for AI.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCE		SEE		CCE		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	Introduction to AI: The AI Problems, AI Techniques, The Level Of The Model, Examples.	2	10
2	State Space Search & Heuristic Search Techniques: Defining The Problems As A State Space Search, Production Systems, Production Characteristics, Production System Characteristics, And Issues In The Design Of Search Programs, Additional Problems. Generate-And- Test, Hill Climbing, Best-First Search, Problem Reduction, Constraint Satisfaction	6	15
3	Knowledge Representation Issues and Approaches: Representations And Mappings, Approaches To Knowledge Representation. Representation Simple Facts In Logic, Representing Instance And Isa Relationships, Computable Functions And Predicates, Resolution. Procedural Versus Declarative Knowledge, Logic Programming, Forward Versus Backward Reasoning.	7	15
4	Natural Language Processing: Introduction, Syntactic Processing, Semantic Analysis, Semantic Analysis, Discourse And Pragmatic Processing, Spell Checking	4	15
5	Connectionist Models: Introduction: Hopfield Network, Learning In Neural Network, Application of Neural Networks, Recurrent Networks, Distributed Representations, Connectionist AI And Symbolic AI.	6	15
6	Introduction To Machine Learning: Learning Problems, designing a learning system, Issues with machine learning. Concept Learning, Version Spaces and Candidate Eliminations, Inductive bias	6	12

7	Supervised and Unsupervised learning: Decision Tree Representation, Decision tree learning, Issues in Decision tree learning. K- Nearest Neighbour Learning, Locally Weighted Regression, Radial Bases, Functions, Case Based Reasoning.	6	18
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List of Text Books:

1. Artificial Intelligence–By Elaine Rich And Kevin Knight (2nd Edition) Tata Mcgraw-Hill, 2nd Edition, 19 September 2018
2. Introduction to Prolog Programming By Carl Townsend, 1 February 1987
3. Tom M Mitchell, “Machine Learning”, Mc GrawHill, 1 July 2017
4. Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig, PHI, 1 January 2015
5. PROLOG Programming For Artificial Intelligence–By Ivan Bratko (Addison-Wesley), 24 August 2011
6. Programming with PROLOG–By Klocksin and Mellish, 31 December 1987
7. Peter Harrington, “Machine Learning in Action”, Dream Tech, 19 April 2012

e-Resources (If any):

1. <https://nptel.ac.in/courses/117/102/117102062/>

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

CLO	Description	Bloom's Taxonomy Level
CLO1	Have basic knowledge representation, problem solving, and learning methods of artificial intelligence	1 Remembering 2 Understanding
CLO2	Problem Reduction	2 Understanding
CLO3	Representations And Mappings	4 Analyze
CLO4	Logic Programming	3 Applying
CLO5	Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem	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	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CLO1	H	M	M	L	L	M			L				H	L		
CLO2		L	M	H	L	L					L	L	M	L	L	
CLO3	L	M	M	L	M	H		M		L			M	L		L
CLO4	M	M	M	L	M	H		M	L				M	L		
CLO5	M	L	L	L	M	H		M		L			H	L	L	

H: High, M: Medium, L: Low