



SILVER OAK UNIVERSITY

College of Technology

Master of Technology

Electronics and Communication

Course Name: Advanced Artificial Intelligence

Course Code: 1010097137

Semester: 1st

Prerequisite:

Overview of different forms of learning, Learning Decision Trees, Neural Networks. Introduction to Natural Language Processing.

Course Objective:

1. The primary objective of this course is to introduce the basic principles, techniques, and applications of Artificial Intelligence.
2. Emphasis will be placed on the teaching of these fundamentals, not on providing a mastery of specific software tools or programming environments.
3. Assigned projects promote a 'hands-on' approach for understanding, as well as a challenging avenue for exploration and creativity.

Teaching Scheme:

Teaching Scheme				
L	T	P	Contact Hours	Credit
3	0	2	5	4

Content:

Unit No.	Course Contents	Teaching Hours	Weightage %
1	Introduction to Data Science and AI & ML, Data Science, AI & ML Use Cases in Business and Scope of Scientific Method, Modeling Concepts	8	20
2	Game-playing: Single player game, Two player game, The Minmax procedure, Minmax Procedure with alpha-beta cutoffs, Quiescent search, search efficiency	8	20
3	Problem Solving: Solving Problems by Searching, heuristic search techniques, constraint satisfaction problems, stochastic search methods.	8	20

4	Knowledge and Reasoning: Building a Knowledge Base: Propositional logic, first order logic, situation calculus. Theorem Proving in First Order Logic.	8	20
5	Natural Language Processing: Introduction, Syntactic Processing, Semantic Analysis, Semantic Analysis, Discourse And Pragmatic Processing, Spell Checking Connectionist Models: Introduction: Hopfield Network, Learning In Neural Network, Application Of Neural Networks, Recurrent Networks, Distributed Representations, Connectionist AI And Symbolic AI Introduction to Prolog: Introduction To Prolog: Syntax and Numeric Function, Basic List Manipulation Functions In Prolog, Functions, Predicates and Conditional, Input, Output and Local Variables, Iteration and Recursion, Property Lists and Arrays, Miscellaneous Topics, LISP and Other AI Programming Languages.	10	20

Course Outcome:

Sr. No.	CO statement	Unit No
CO-1	Understand fundamental understanding of the history of artificial intelligence (AI) and its foundations.	1,2
CO-2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning	1,2,3
CO-3	Understand the awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.	3,4,5
CO-4	To study proficiency in applying scientific method to models of machine learning	4,5
CO-5	Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.	1,5

Teaching & Learning Methodology: -

1. Direct Instruction
2. Flipped Classrooms
3. Kinesthetic Learning
4. Context-Based Learning
5. Adaptive Teaching

List of Experiments/Tutorials:

Total Hours: 28

Sr. No.	Practical Name
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1	Write a program to implement Tic-Tac-Toe game problem.
2	Write a program to implement BFS (for 8 puzzle problem or Water Jug problem or any AI search problem).
3	Write a program to implement DFS (for 8 puzzle problem or Water Jug problem or any AI search problem).
4	Write a program to implement Single Player Game (Using Heuristic Function)
5	Write a program to Implement A* Algorithm.
6	Write a program to solve N-Queens problem using Prolog
7	Write a program to solve 8 puzzle problem using Prolog.
8	Write a program to solve travelling salesman problem using Prolog.

Major Equipment:

Computer/Prolog Language

Books Recommended: -

1. Nils J Nilson, Artificial intelligence: A new synthesis, Morgan Kaufmann Publishers.
2. E Rich and K Knight, Artificial intelligence, Tata MacGraw Hill Publishing
3. Giarratano and Tiley, Expert Systems – Principal and programming, Thomson Publishing.

List of Open Source Software/learning website:

1. <http://www.journals.elsevier.com/artificial-intelligence/>
2. <https://www.technologyreview.com/s/534871/our-fear-of-artificial-intelligence/>
3. <http://www.sanfoundry.com/artificial-intelligence-mcqs-inductive-logic-unification-lifting-1/>

CO-PO Matrix:

CO No.	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2
CO -1	3			2	2	2		1	1				2	3
CO -2		2		2		1								3
CO -3			3		3	2							2	-
CO -4	3	3	3									2		3
CO -5		3		3	3	2		1	3			3		3