



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

## COURSE CONTENT

ARTIFICIAL INTELLIGENCE LAB									
IV Semester: CSE / CSM									
VI Semester: CSD									
Course Code	Category	Hours / Week			Credits	Maximum Marks			
		L	T	P		C	CIA	SEE	Total
24X0581	Core	0	0	2	1	40	60	100	
		Practical Classes: 30				Total Classes: 30			
Contact Classes: Nil		Tutorial Classes: Nil		Practical Classes: 30			Total Classes: 30		
<b>Prerequisites:</b> A course on “Artificial Intelligence”									

### Course Overview:

This lab focuses on learning AI programming through **LISP and Prolog**. Students practice recursion, arithmetic operations, and logic representation, then move on to solving classic AI problems like Towers of Hanoi, Tic-Tac-Toe, 8-Puzzle, Water-Jug, Monkey-Banana, and N-Queens. They also implement algorithms such as Min-Max, check graph connectivity, and design simple interactive programs like login systems. Overall, the lab builds both problem-solving skills and practical experience in AI programming.

### Course Objectives:

1. Comprehensive understanding of advanced AI technologies, learn to identify and solve appropriate problems using expert systems.
2. Apply core AI principles to create effective solutions.
3. Designed to build the skills necessary for designing implementing and evaluating AI based systems and expert systems.

### Course Outcomes: After Completion of the Course, Students should be able to

- Develop LISP programs for arithmetic operations, recursive list processing, and mathematical function implementation.
- Construct Prolog programs for logical facts, list manipulation, temperature conversion, and rule-based reasoning.
- Implement classical AI problem-solving applications including Tic-Tac-Toe, 8-Puzzle, Water-Jug, Monkey-Banana, and N-Queens problems.
- Apply search and optimization techniques including Min-Max, Hill Climbing, Simulated Annealing, and heuristic approaches for TSP.
- Design logic-based programs for list validation and controlled login attempts with execution constraints.

### List of Experiments

S. No	List of Experiments
1	Write a LISP code to perform Arithmetic operations
2	Write a Recursive LISP function which takes one argument as a list and return reverse of the list
3	Write a LISP function to compute difference of squares.(if $x > y$ return $x^2 - y^2$ , Otherwise $y^2 - x^2$ ).

4	Write simple fact for following: A. Ram likes mango. B. Seema is a girl. C. Bill likes Cindy. . Rose is red. E. John owns gold
5	Write a Prolog program that convert temperature from Celsius to Fahrenheit
6	Write simple Prolog functions such as the following. Take into account lists which are too short. -- remove the Nth item from the list. -- insert as the Nth item
7	Write a Program to Implement Tic-Tac-Toe game
8	Write a Program to Implement 8-Puzzle problem
9	Write a Program to Implement Water-Jug problem
10	Write a Program to Implement Monkey Banana Problem
11	Write a Program to Implement N-Queens Problem.
12	Write a Program to Implement Min-Max Algorithm.
13	Implementation of TSP using heuristic approach using PROLOG.
14	Implementation of Simulated Annealing Algorithm using PROLOG.
15	Implementation of Hill climbing to solve 8 puzzle problem.
16	Write a Program see all elements are present in the list or not.
17	Write a Program to login so that user can attempt 3 times. After 3rd attempt program must terminate with message "NOT PERMITTED FOR LOGIN"

#### TEXT BOOKS:

1. Artificial Intelligence A modern approach, Stuart Russell and Peter Norving, 3<sup>rd</sup> Edition, Pearson Education.

#### REFERENCE BOOKS:

1. Artificial Intelligence, E. Rich and K.Knoght, 3<sup>rd</sup> Edition, TMH.
2. Artificial Intelligence, Patrick Henny Winston, 3<sup>rd</sup> Edition, Pearson Education.
3. Artificial Intelligence, ShivaniGoel, Pearson Education.

#### ELECTRONIC RESOURCES:

4. [https://www.tutorialspoint.com/lisp/index.htm?utm\\_source=copilot.com](https://www.tutorialspoint.com/lisp/index.htm?utm_source=copilot.com)
5. <https://www.geeksforgeeks.org/explore?page=1&sortBy=submissions>
6. [https://gigamonkeys.com/book/?utm\\_source=copilot.com](https://gigamonkeys.com/book/?utm_source=copilot.com)

#### MATERIALS ONLINE:

1. Lab Manual
2. Open-ended experiments