K. S. INSTITUTE OF TECHNOLOGY

An Autonomous Institution under VTU, Approved by AICTE

Department of Computer Science & Engineering

M.Tech FIRST SEMESTER SYLLABUS

Course: Algorithms & AI Lab		Semester	I
Course Code	**25MCSL106**	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	0:0:2	SEE Marks	60
Total Hours of Pedagogy	36	Total Marks	100
Credits	02	Exam Hours	03
Examination type (SEE)	**Laboratory**		

Course Learning Objectives: This course 25MCSL106 will enable students to:

- Implement and evaluate Algorithm and AI in Python programming language.

Descriptions (if any):

- **Installation procedure of the required software must be demonstrated, carried out in groups and documented in the journal.**

Programs List:

1.	Implement a simple linear regression algorithm to predict a continuous target variable based on a given dataset.
2.	Develop a program to implement a Support Vector Machine for binary classification. Use a sample dataset and visualize the decision boundary.
3.	Develop a simple case-based reasoning system that stores instances of past cases. Implement a retrieval method to find the most similar cases and make predictions based on them.
4.	Write a program to demonstrate the ID3 decision tree algorithm using an appropriate dataset for classification.
5.	Build an Artificial Neural Network by implementing the Backpropagation algorithm and test it with suitable datasets.
6.	Implement a KNN algorithm for regression tasks instead of classification. Use a small dataset, and predict continuous values based on the average of the nearest neighbors.
7.	Create a program that calculates different distance metrics (Euclidean and Manhattan) between two points in a dataset. Allow the user to input two points and display the calculated distances.
8.	Implement the k-Nearest Neighbor algorithm to classify the Iris dataset, printing both correct and incorrect predictions.
9.	Develop a program to implement the non-parametric Locally Weighted Regression algorithm, fitting data points and visualizing results.
10.	Implement a Q-learning algorithm to navigate a simple grid environment, defining the reward structure and analyzing agent performance.

Laboratory Outcomes: The student should be able to:

- Implement and demonstrate AI algorithms.
- Evaluate different algorithms.

Conduct of Practical Examination: Experiment distribution

- For laboratories having only one part: Students are allowed to pick one experiment from the lot with equal opportunity.
- For laboratories having PART A and PART B: Students are allowed to pick one experiment from PART A and one experiment from PART B, with equal opportunity.
- Change of experiment is allowed only once and marks allotted for procedure to be made zero of the changed part only.
- Marks Distribution *(Courseed to change in accoradance with university regulations)*
- For laboratories having only one part – Procedure + Execution + Viva-Voce: 15+70+15 = 100 Marks.