| Semester | VI | Course Title | AI & ML Lab | Course Code | 18 ECL68 |
|---|---|---|---|---|---|
| Teaching Period | 50 Hours | L – T – P – TL* | 0– 0 – 3– 3 | Credits | 2 |
| CIE* | 40 Marks | SEE* | 60 Marks | Total | 100 Marks |

**CREDITS- 02**

**Course Objectives:**
- To introduce to the basic concepts of Artificial Intelligence, with illustrations of current state of the art research and applications
- To identify the type of an AI problem (search inference, decision making under uncertainty, game theory, etc.)
- Make use of Data sets in implementing the machine learning algorithms
- Implement the machine learning concepts and algorithms in any suitable language of choice

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## PART-A

**Part–A: AI PROGRAMMING**

**(Note:** Programming can be done using PROLOG/PYTHON)

1. Write a program to solve 8 queens problem

2. Solve any problem using depth first search.

3. Solve any problem using best first search.

4. Solve 8-puzzle problem using best first search

5. Solve Robot (traversal) problem using means End Analysis

6. Solve traveling salesman problem.

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## :: Part-B::

**Part–B: ML Programming(at least four of the following must be covered using python)**

(Note:  The programs can be implemented in Python. programs are to be developed without using the built-in classes or APIs of Python. 3. Data sets can be taken from standard repositories (https://archive.ics.uci.edu/ml/datasets.html) or constructed by the students.

1. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.

2. Build an Artificial Neural Network by implementing the Back propagation algorithm and test the same using appropriate data sets.

3. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.

4. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Python ML library classes/API.

5. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can add Python ML library classes/API in the program.

6. Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.

**Course Outcomes:**
- Build awareness of AI facing major challenges and the complexity of typical problems within the field.

- Assess critically the techniques presented and apply them to real world problems

- Understand the implementation procedures for the machine learning algorithms.

- Design python programs and apply appropriate data sets to the Machine Learning algorithms.

- Identify and apply Machine Learning algorithms to solve real world problems.