



**Gokhale Education Society's
R. H. Sapat College of Engineering, Management Studies &
Research, Nashik
Department of Computer Engineering**

PRACTICAL PLAN

A. Y. 2025-26

Subject & Code:	Laboratory Practice-III (410246)	Course:	2019
Class:	BE	Div:	A/B
Semester:	VII	Allotted Practical:	15

Companion Course: Design and Analysis of Algorithms (410241), Machine Learning(410242), Blockchain Technology(410243)

Course Objectives:

- Learn effect of data preprocessing on the performance of machine learning algorithms
- Develop in depth understanding for implementation of the regression models.
- Implement and evaluate supervised and unsupervised machine learning algorithms.
- Analyze performance of an algorithm.
- Learn how to implement algorithms that follow algorithm design strategies namely divide and conquer, greedy, dynamic programming, backtracking, branch and bound.
- Understand and explore the working of Blockchain technology and its applications.

Course Outcomes:

CO	CO Statement
CO1	Apply preprocessing techniques on datasets.
CO2	Implement and evaluate linear regression and random forest regression models.
CO3	Apply and evaluate classification and clustering techniques.
CO4	: Analyze performance of an algorithm.
CO5	: Implement an algorithm that follows one of the following algorithm design strategies: divide and conquer, greedy, dynamic programming, backtracking, branch and bound.
CO6	Interpret the basic concepts in Blockchain technology and its applications



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Sr No.	Design and Analysis of Algorithms	
1.	Write a program non-recursive and recursive program to calculate Fibonacci numbers and analyze their time and space complexity	CO4
2.	Write a program to solve a fractional Knapsack problem using a greedy method.	CO4, CO5
3.	Write a program to implement Huffman Encoding using a greedy strategy	CO4, CO5
4.	Design n-Queens matrix having first Queen placed. Use backtracking to place remaining Queens to generate the final n-queen's matrix.	CO4,CO5
5.	Write a program for analysis of quick sort by using deterministic and randomized variant	CO4,CO5
	Mini Project	CO4,CO5
	Machine Learning	
6.	Predict the price of the Uber ride from a given pickup point to the agreed drop-off location. Perform following tasks: 1. Pre-process the dataset. 2. Identify outliers. 3. Check the correlation. 4. Implement linear regression and random forest regression models. 5. Evaluate the models and compare their respective scores like R2, RMSE, etc. Dataset link: https://www.kaggle.com/datasets/yasserh/uber-fares-dataset	CO1,CO2
7.	Classify the email using the binary classification method. Email Spam detection has two states: a) Normal State – Not Spam, b) Abnormal State – Spam. Use K-Nearest Neighbors and Support Vector Machine for classification. Analyze their performance. Dataset link: The emails.csv dataset on the Kaggle https://www.kaggle.com/datasets/balaka18/email-spam-classification-dataset-csv	CO1,CO2,CO3

<p>8. Given a bank customer, build a neural network-based classifier that can determine whether they will leave or not in the next 6 months.</p> <p>Dataset Description: The case study is from an open-source dataset from Kaggle. The dataset contains 10,000 sample points with 14 distinct features such as CustomerId, CreditScore, Geography, Gender, Age, Tenure, Balance, etc. Link to the Kaggle project: https://www.kaggle.com/barelydedicated/bank-customer-churn-modeling</p> <p>Perform following steps:</p> <ol style="list-style-type: none"> 1. Read the dataset. 2. Distinguish the feature and target set and divide the data set into training and test sets. 3. Normalize the train and test data. 4. Initialize and build the model. Identify the points of improvement and implement the same. 5. Print the accuracy score and confusion matrix (5 points). 	<p>CO1,CO2,CO3</p>
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<p>9. Implement K-Nearest Neighbors algorithm on diabetes.csv dataset. Compute confusion matrix, accuracy, error rate, precision and recall on the given dataset.</p> <p>Dataset link : https://www.kaggle.com/datasets/abdallamahgoub/diabetes</p>	<p>CO1, CO3</p>
<p>10. Implement K-Means clustering/ hierarchical clustering on sales_data_sample.csv dataset. Determine the number of clusters using the elbow method.</p> <p>Dataset link : https://www.kaggle.com/datasets/kyanyoga/sample-sales-data</p>	<p>CO1,CO3</p>
<p>Mini Project</p>	
<p>Blockchain Technology</p>	
<p>11. Installation of MetaMask and study spending Ether per transaction.</p>	<p>CO6</p>
<p>12. Create your own wallet using Metamask for crypto transactions.</p>	<p>CO6</p>
<p>13. Write a smart contract on a test network, for Bank account of a customer for following operations:</p> <ul style="list-style-type: none"> • Deposit money • Withdraw Money • Show balance 	<p>CO6</p>
<p>14. Write a program in solidity to create Student data. Use the following constructs:</p> <ul style="list-style-type: none"> • Structures • Arrays • Fallback 	<p>CO6</p>

	Deploy this as smart contract on Ethereum and Observe the transaction fee and Gas values.	
15	Write a program to create a Business Network using Hyperledger	CO6
	Mini Project	CO6

Prepared By: Approved By:

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