Walchand College of Engineering, Sangli

(Government Aided Autonomous Institute)

AY 2023-24

Course Information

Programme	M.Tech.
Class, Semester	First Year M. Tech.CSE Sem II
Course Code	7OE509
Course Name	Machine Learning in practice
Desired Requisites:	Basic mathematics and python programming

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	3 Hrs/week	**ISE**	**MSE**	**ESE**	**Total**
Tutorial	-	20	30	50	100
Practical	-				
Interaction	-	**Credits: 3**			

Course Objectives

1	To introduce python and mathematical concepts required for machine learning
2	To prepare data for machine learning
3	To implement supervised and unsupervised learning algorithm

Course Outcomes (CO) with Bloom's Taxonomy Level

CO1	Apply different data pre-processing techniques required for data preparation.	Apply
CO2	Identify and implement different machine learning algorithms to solve real life problems.	Analyze
CO3	Evaluate and compare performance of the machine learning algorithms.	Evaluate

Module	**Module Contents**	**Hours**
I	**Introduction to Machine Learning** Introduction, Types of machine learning, Applications of Machine Learning, Python basics: basic constructs of python, pandas, NumPy, Matplotlib for data visualization	6
II	**Data pre-processing** Data Cleaning: handling missing values, removing noise from data, handling categorical features, Feature selection and reduction, Data normalization, Train/test split, cross-validation	6
III	**Supervised Learning-I** Linear regression, multiple regression, MSE, RMSE Classification using Naïve Bayes classifier, Decision tree classifier, KNN, logistic regression	8
IV	**Supervised Learning-II** Ensemble models: tree-based algorithms, Bagging, Boosting, Stacking **Model Performance** Confusion matrices, accuracy, precision, recall, F1 score, Hyperparameter tuning, deployment	8
V	**Unsupervised Learning** Clustering- K means clustering, HDBSCAN, Dimensionality reduction using PCA.	5
VI	**Reinforcement learning and Case study** Introduction to reinforcement learning, Types, elements and applications of	6

	Reinforcement learning, Case studies based on various applications of machine learning algorithms in real life.	
Text Books		
1	Machine Learning. Tom Mitchell. First Edition, McGraw- Hill, 1997.	
2		
3		
References		
1	Introduction to Machine Learning Edition 2, by Ethem Alpaydin.	
2		
3		
Useful Links		
1	NPTEL 'Introduction to Machine learning' -Link	
2		

CO-PO Mapping						
	Programme Outcomes (PO)					
	1	2	3	4	5	6
CO1	2	2				
CO2				3		
CO3	1		1			2
The strength of mapping is to be written as 1,2,3; Where, 1: Low, 2: Medium, 3: High. Each CO of the course must map to at least one PO.						

Assessment (for Theory Course)
The assessment is based on 1 in-semester examinations in the form of ISE of 20 marks and MSE of 30 Marks. Also, there is End-Sem examination (ESE) of 50 marks. MSE shall be typically on modules 1 2 and 3, ISE based typically on all the modules and ESE shall be on all modules with nearly 30% weightage on first 3 modules and 70% weightage on modules 4, 5, 6.

Assessment Plan based on Bloom's Taxonomy Level (Marks) For Theory Course					
Bloom's Taxonomy Level		**ISE**	**MSE**	**ESE**	**Total**
1	Remember				
2	Understand				
3	Apply		15	20	35
4	Analyse		15	20	35
5	Evaluate	20		10	30
6	Create				
Total		**20**	**30**	**50**	**100**