SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

FACULTY OF ENGINEERING AND TECHNOLOGY

SCHOOL OF COMPUTING

DEPARTMENT OF DATA SCIENCE AND BUSINESS SYSTEMS

18CSE392T - MACHINE LEARNING - I- 3 0 0 3

Course Auditor:

Course Coordinator:

Course Handling Faculties:

1. Dr.G.Vadivu, Professor/DSBS
2. Dr.E.Sasikala, Professor/DSBS

COURSE OUTCOMES (CO): At the end of this course, learners will be able to:	
CO-1	Understand the concepts of machine learning
CO-2	Learn and understand machine tools and libraries of machine learning
CO-3	Learn and understand the linear learning models and classification in machine learning
CO-4	Understand the clustering techniques and their utilization in machine learning
CO-5	Study the tree-based machine learning techniques and to appreciate their capability

Syllabus:

Please find as separate file

Weekly Plan for Theory and Project

Week No.	**Theory**	**Tutorial**
Week 1	Unit - I	Machine Learning: What and Why? Types of Machine Learning Supervised Learning Unsupervised Learning Reinforcement learning The Curse of dimensionality Over fitting and under fitting linear regression
Week 2	Unit - I	Bias and Variance tradeoff Testing – cross validation Regularization Learning Curve Classification Error and noise

		Parametric vs. non-parametric models Linear Algebra for machine learning
		Project Review 1
Week 3	Unit - II	Platform for machine learning Machine learning python libraries Scikit-learn training data – testing data – validation data k-fold cross validation Features Performance metrics MSE, accuracy, confusion matrix, precision
Week 4	Unit - II	recall, F- score Linear Regression with multiple variables Logistic Regression spam filtering with logistic regression
Week 5	Unit - II	Naive Bayes with scikit-learn
		Project Review 2
Week 6	Unit - III	Ridge Regression Maximum likeliwood estimation (least squares) principal component analysis Bayesian classifier
Week 7	Unit - III	Support vector machine Support vector machine + kernels Multi class classification K nearest neighbour classification Application: face recognition with PCA
Week 8	Unit - IV	Measuring (dis)similarity Evaluating output of clustering methods Spectral clustering Hierarchical clustering Agglomerative clustering Divisive clustering
Week 9	Unit - IV	Choosing the number of clusters Clustering datapoints and features Bi-clustering Multi-view clustering
Week 10	Unit - IV	K-Means clustering K-meloids clustering Application: image segmentation using K- means clustering
		Project Review 3
Week 11	Unit - V	Decision tree representation Basic decision tree learning algorithm Inductive bias in decision tree Decision tree construction Issues in decision tree
Week 12	Unit - V	Classification and regression trees (CART) Random Forest Random Forest with scikit-learn Multivariate adaptive regression trees (MART) Introduction to Artificial Neural Networks

		Perceptron learning
		Report and Viva

Course Assessment Plan

S. No.	Components		Marks
1	CLA 1	CT1 (Unit 1 & 2) + **Assignment 1**	5+5
2	CLA 2	CT2 (Unit 2 & 3) + **Assignment 2**	7.5+7.5
3	CLA 3	CT2 (Unit 4 & 5) + **Assignment 3** + **Certification**	5+5+5
4	CLA 4	Project Review - 1	2
5	CLA 4	Project Review - 2	3
6	CLA 4	Project Report Submission	5
		Final Examinations	50
Total			100

Table 1: Rubrics for Project

Regno:		**Name:**	
S. No.	**Project Review 1:** **2 Marks**	**Project Review 2:** **3 Marks**	**Report and Viva:** **5 Marks**
1	• Team formation • Title submission: • Idea/Objective • Literature Review	ML Algorithms Visualization Demo	• Report submission: 5

- *All the students have to complete the project on time*

Table 3: Rubrics for Assignments

Component (Performance Indicator)	**Good**	**Satisfactory**	**Unsatisfactory**
Program Execution - Coding Standard **(8 Marks)**	Proper naming and coding guidelines are followed. [8 Marks]	Proper naming and no coding guidelines are followed. [5 Marks]	No proper naming and coding guidelines are followed. [0 Mark]
Output & Viva **(2 Marks)**	Proper Output and Answered the questions [2 Marks]	Partial Output and Answered the questions [1 Mark]	Error and not answered the questions [0 Mark]
Total marks obtained:			

Note: A student who does not secure a minimum of 4 marks should redo the experiment

Submit the Assignments through GCR

Name of the Faculty	
Signature of the Faculty	
Date	