



ARSD College, University of Delhi

Lesson Plan

Course Name: Machine Learning B.Sc. (Hons.) Computer Science (Practical)						
Semester	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical (P)	Credit (C)
VI	32347607	DSE- 4 Machine Learning	4 Credit-4	0	4 Credit-2	6
Teacher/Instructor(s)		Ms. Uma Ojha				
Session		2021-2022				

Course Objective:

The course aims at introducing the basic concepts and techniques of machine learning so that a student can apply machine-learning techniques to a problem at hand.

Course Learning Outcomes:

On successful completion of the course, students will be able to:

1. Differentiate between supervised and unsupervised learning tasks.
2. Differentiate between linear and non-linear classifiers.
3. Describe theoretical basis of SVM.
4. Implement various machine-learning algorithms learnt in the course.

List of Experiments:

Details of the Lab Course		
Session	Name of Experiment	Contact Hours
1	<p>a. Perform elementary mathematical operations in Octave/MATLAB like addition, multiplication, division and exponentiation.</p> <p>b. Perform elementary logical operations in Octave/MATLAB (like OR, AND, Checking for Equality, NOT, XOR).</p>	4
2	<p>a. Create, initialize and display simple variables and simple strings and use simple formatting for variable.</p> <p>b. Create/Define single dimension / multi-dimension arrays, and arrays with specific values like array of all ones, all zeros, array with random values within a range, or a diagonal matrix.</p>	4
3	<p>a. Use command to compute the size of a matrix, size/length of a particular row/column, load data from a text file, store matrix data to a text file, finding out variables and their features in the current scope.</p> <p>b. Perform other matrix operations like converting matrix data to absolute values, taking the negative of matrix values, adding/removing rows/columns from a matrix, finding the maximum or minimum values in a matrix or in a row/column, and finding the sum of some/all elements in a matrix.</p>	4
4	Create various type of plots/charts like histograms, plot based on sine/cosine function based on data from a matrix. Further label different axes in a plot and data in a plot.	4
5	Generate different subplots from a given plot and color plot data.	4
6	Use conditional statements and different type of loops based on simple examples.	4
7	Perform vectorized implementation of simple matrix operation like finding the transpose of a matrix, adding, subtracting or multiplying two matrices.	4

8	Implement Linear Regression problem. For example, based on a dataset comprising of existing set of prices and area/size of the houses, predict the estimated price of a given house.	4
9	Based on multiple features/variables perform Linear Regression. For example, based on a number of additional features like number of bedrooms, servant room, number of balconies, number of houses of years a house has been built – predict the price of a house.	4
10	Implement a classification problem to detect whether an email is spam or not.	4
11	Implement a classification/ logistic regression problem. For example based on different features of students data, classify, whether a student is suitable for a particular activity.	4
12	Use some function for regularization of dataset based on problems	4
13	Use some function for neural networks, like Stochastic Gradient Descent or backpropagation - algorithm to predict the value of a variable based on the dataset.	4
Total		52

Evaluation Scheme:

No.	Component	Duration	Marks
1.	End Semester Examination	4 hr	50

Suggested Books:

Sl. No.	Name of Authors/Books/Publishers	Year of Publication/Reprint
1.	Flach, P. (2015). Machine Learning: The Art and Science of Algorithms that Make Sense of Data. Cambridge University Press.	2015
2.	Mitchell, T.M. (2017). Machine Learning. McGraw Hill Education.	2017
	Christopher & Bishop, M. (2016). Pattern Recognition and Machine Learning. New York: Springer-Verlag	2016
Mode of Evaluation:		End Semester Exam