Branch: BCA	Semester-VI
Subject Code:6104	Lecture: 04 Credit: 04
Course Opted	Discipline Specific Elective – 4
Subject Title	MACHINE LEARNING

Course Objectives:

- To introduce students to the basic concepts and techniques of Machine Learning.
- To become familiar with regression methods, supervised and unsupervised learning
- To become familiar with the Applications of Machine Learning Algorithms

Course Outcomes:

- Gain knowledge about basic concepts of Machine Learning
- Identify machine learning techniques suitable for a given problem
- Solve the problems using various machine learning techniques
- Apply Dimensionality reduction techniques.
- Design application using machine learning techniques

Modules	Sr. No.	Topic and Details	No. of Lectures Assigned	Marks Weightage %
UNIT -I	1	**Introduction to Machine Learning**: History of Machine Learning, Introduction and installation of Python, NumPy and SciPy.	4	8
	2	**Introduction and installation of Matplotlib, SymPy, Mathematical Foundations:** L1 and L2 form, Type of Matrixes, Eigenvector and eigenvalues, Singular-Value Decomposition.	6	12
	3	Formation of Mean, Median, Mode, Confusion Matrix, Bias and Variance	5	10
UNIT -II	4	**Linear regression**: Meaning, Ordinary Least Squares Regression (OLSR), over fitting, Multivariate Adaptive Regression Splines (MARS).	5	10
	5	**Logistic Regression**: Meaning, Regularization, Regularized Linear Regression, Regularized Logistic Regression.	5	10
UNIT -III	6	**Supervised Learning**: Decision tree, Support Vector Machine (SVM).	5	10
	7	Random forest, Naive Bayes, and k-nearest neighbor, Neural Network.	5	10
UNIT -IV	8	**Unsupervised Learning:** k-means Clustering, Hidden Markov Model, DBSCAN Clustering.	5	10

	9	**Unsupervised Learning**: PCA, t-SNE, SVD, Association rule.	5	10
	10	**Applications of Machine Learning Algorithms:** Virtual Personal Assistants**,** Siri, Alexa, Google Home, Face Recognition, Email Spam and Malware Filtering etc.	5	10
TOTAL			**50**	**100**

Text Books:

1. Dr. Nilesh Shelke, Dr. Narendra Chudhari, Dr. Gopal Sakarkar “Introduction to Machine Learning “, DAS GANU PRAKASHAN
2. Dr. A Krishna Mohan, Dr. T Murali Mohan, Karunakar,” Pyhton with Machine Learning”, S. Chand Prakashan

Reference Books:

1. Introduction to machine learning, Ethem Alpaydin. —2nd ed., The MIT Press, Cambridge, Massachusetts, London, England.
2. Introduction to artificial neural systems, J. Zurada, St. Paul: West.
3. Machine Learning, Tom M Mitchell.