

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
 IBRAHIMBAGH, HYDERABAD – 500 031  
**DEPARTMENT OF INFORMATION TECHNOLOGY**

**INTRODUCTION TO MACHINE LEARNING**  
**(AI&ML TRACK : OPEN ELECTIVE-IV)**  
 (Common for ECE, EEE, MECH & CIVIL)  
 SYLLABUS FOR B.E VI- SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code: <b>U22OE620IT</b>
Credits: 3	CIE Marks: 40	Duration of SEE :3Hrs

<b>Course Objectives</b>	<b>Course Outcomes</b>
The course will enable the students to:	At the end of the course student will be able to:
Introduce the fundamental concepts, techniques and modern tools in Artificial intelligence and Machine Learning field to effectively apply it to the real-world problems.	1. Demonstrate knowledge of the Artificial intelligence and machine learning literature. 2. Understand and apply latest Python libraries for Machine learning models. 3. Apply an appropriate algorithm for a given problem. 4. Apply machine learning techniques in the design of computer systems. 5. Explain the relative strengths and weaknesses of different machine learning methods and approaches.

**UNIT-I:**

**Introduction to AIML:** Foundations of AI, Sub areas of AI, Applications. Introduction to learning, Types of Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning.

**Introduction to Python and ML libraries:** intro to python data types, control flow, loops, functions, modules & packages. Intro to NumPy & Scikit-learn.

**UNIT-II:**

**Supervised learning:** ML Task, ML Experience or Data, ML Performance metric, Linear Regression, Linear regression Simulator, Logistic Regression.

**Supervised Non-parametric learning:** Introduction to Decision Trees, K-Nearest Neighbor, Feature Selection.

**UNIT-III:**

**Supervised Parametric learning (Neural networks):** Perceptron, Multilayer Neural Network, Playground Simulator, Backpropagation.

**UNIT-IV:**

**Supervised Parametric learning:** Support Vector Machine, Kernel function and Kernel SVM.

**Supervised Parametric Bayesian learning:** Introduction, Naive Bayes Classification, Bayesian Network.

**UNIT-V:**

**Unsupervised learning:** Clustering, K-means Clustering, DBSCAN

**Learning Resources:**

1. Tom Mitchell, Machine Learning, First Edition, McGraw-Hill, 1997
2. Christopher Bishop. Pattern Recognition and Machine Learning. Second Edition.
3. Ethem Alpaydin, Introduction to Machine Learning, Second Edition
4. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e, 2008.
5. <http://nptel.ac.in/courses/106106139/>
6. <https://www.w3schools.com/python/>
7. <https://www.w3schools.com/python/numpy/default.asp>
8. <https://scikit-learn.org/stable/>
9. [Linear Regression Simulator \(mladdict.com\)](http://mladdict.com/linear-regression-simulator/)
10. [Neural Network Playground simulator](http://mladdict.com/neural-network-simulator/)
11. <https://www.mladdict.com/neural-network-simulator>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90 Minutes			