



B.M.S. COLLEGE OF ENGINEERING, BENGALURU-19

(Autonomous Institute, Affiliated to VTU)

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Course Title	Machine Learning				
Course Code	22IS6PCMLG	Credits	4	L-T-P	3-0-1
CIE	50 Marks	SEE	100 Marks (50% Weightage)		
Contact Hours/ Week	5	Total Lecture Hours	40		

UNIT - 1

The Machine Learning Landscape: What is Machine Learning? Why use Machine Learning? Types of Machine Learning systems, Main Challenges of Machine Learning, Testing and Validation.

End-to-End Machine Learning Project: Look at the Big Picture, Get the Data, Discover and Visualize the Data to Gain Insights, Prepare the Data for Machine Learning Algorithms, Data Cleaning, Feature Scaling, Select and Train a Model, Training and Evaluating on the Training Set, Fine-Tune Your Model.

UNIT - 2

Classification: Training a Binary Classifier, Performance Measures, Multiclass Classification, Error Analysis. **Training Models:** Linear Regression, Gradient Descent, Polynomial Regression, Regularized Linear Models, Logistic Regression.

UNIT - 3

Decision Trees: Training and Visualizing a Decision Tree, Making Predictions, Estimating Class Probabilities, The CART Training Algorithm, Computational Complexity, Gini Impurity or Entropy? Regularization Hyper parameters.

UNIT - 4

Ensemble Learning and Random Forests: Voting Classifiers, Bagging and Pasting, Random Forests, Boosting.

Dimensionality Reduction: The Curse of Dimensionality, Main Approaches for Dimensionality Reduction, PCA.

UNIT - 5

Unsupervised Learning Techniques: Clustering, k-means, Limits of K-Means, Using Clustering for Pre-processing, DBSCAN.



B.M.S. COLLEGE OF ENGINEERING, BENGALURU-19

(Autonomous Institute, Affiliated to VTU)

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Text Books:

1. Hands-On Machine Learning with Scikit-Learn & Tensor Flow, Aurelian Geron, 2nd Edition.
2. Python Machine Learning, Sebastian Raschka and Vahid Mirjalili, 3rd Edition.

Reference Books:

1. Introduction to Machine Learning, Ethem Alpaydin, The MIT Press, 3rd Edition 2014.

e- Books:

1. Hands on Machine Learning with scikit learn, keras and tensor flow.
<https://www.oreilly.com/library/view/hands-on-machine-learning/9781492032632/>

MOOCs:

1. Introduction to Machine Learning, https://swayam.gov.in/nd1_noc19_cs52/preview
2. Supervised Machine Learning, <https://www.coursera.org/learn/machine-learning/>
3. Introduction to Machine Learning, <https://nptel.ac.in/courses/106106139/>

COURSE OUTCOMES (COs)

At the end of the course, the student will be able to:

CO1	Acquire knowledge on basic concepts of Machine Learning techniques such as supervised and unsupervised learning.
CO2	Identify & Apply the concepts of Machine Learning algorithms to a given problem.
CO3	Design and Develop applications using Machine Learning techniques using modern tools.
CO4	Communicate effectively in a team and investigate on the topics related to Machine learning algorithms.