

# MACHINE LEARNING

<b>CREDITS:</b>	<b>3</b>
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## OBJECTIVE:

- To introduce Learners to the basic concepts and techniques of Machine Learning
- It will give you insights on how to apply machine learning to solve a new problem.

## UNIT I - INTRODUCTION

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Human Learning - Types of Human Learning, Machine Learning - Types of Machine Learning, Applications, Tools, Issues, Types of Data in Machine Learning, Exploring Structure of Data, Data Quality and Remediation, data Pre-Processing, Selecting and Training a Model, Model Representation and Interpretability, Evaluating and Improving performance of a Model.

## UNIT II - BAYESIAN LEARNING

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Bayes Theorem and Concept Learning, Maximum Likelihood and Least-squared Error Hypotheses, Maximum Likelihood Hypotheses for Predicting Probabilities, Minimum Description Length Principle, Bayes Optimal Classifier, Gibbs Algorithm, Naive Bayes Classifier, Bayesian Belief Networks, EM Algorithm.

## UNIT III - SUPERVISED LEARNING

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Classification Model, Classification Learning Steps, Common Classification Algorithms, Understanding the Biological Neuron, Exploring the Artificial Neuron, Types of Activation Functions, Early Implementations of Artificial Neural Networks, Architectures of Neural Networks, Learning Process in Artificial Neural Networks.

## UNIT IV - UNSUPERVISED LEARNING

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Unsupervised vs Supervised Learning, Applications of Unsupervised Learning, Clustering, Finding pattern using Association Rule, Other Unsupervised Learning Problems – Principal Component Analysis, Topic Modeling.

## UNIT V - OTHER TYPES OF LEARNING

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Instance-Based Learning, Genetic Algorithms, Analytical Learning, Reinforcement Learning

**TOTAL: 45 PERIODS**

## OUTCOME:

- Understand complexity of Machine Learning algorithms and their limitations.
- Be capable of performing experiments in Machine Learning using real-world data.

## REFERENCES

1. Saikat Dutt, Subramanian Chandramouli and Amit Kumar Das, Machine Learning, Pearson Education, 2019
2. Anuradha Srinivasaraghavan, Vincy Elizabeth Joseph, Machine Learning, Wiley, 2019

3. Thom Mitchell, Machine Learning, McGraw Hill Education, 2017
4. Oliver Theobald, Machine Learning for Absolute Beginners, 2017
5. Ethem Alpaydin, Introduction to Machine Learning, 3<sup>rd</sup> edition, 2014