**Machine Learning Syllabus**

**Introduction to Machine Learning**

What is Machine Learning

How Machine Learning Works

Types of Machine Learning – Supervised and Unsupervised

#### Data

Types of Data

Graphical and Analytical Representation of Data

Limitations of Traditional Data Analysis

#### Introduction to Python

Introduction to Python and Installing Jupyter Notebook

Basic Libraries in Python (Pandas, Numpy, Matplotlib)

Understanding Basics of Python Programming (Conditional- Iterative Statements and Function)

Basic Data Exploration

Advanced Functions for Data Manipulation

#### Data Exploration and Pre-processing

Context Setting and Problem Statement

Data exploration - Target Variable

Data Exploration - Independent Numerical Variables

Data Exploration - Categorical Variables

Splitting of Data

Feature Scaling of Data

#### Linear Regression

Building Your First Predictive Model (Regression) and Evaluate Performance

Introduction to Linear Regression

Understanding Gradient Descent

Assumptions of Linear Regression

Implementing Linear Regression

Feature Engineering

#### Introduction to Dimensionality Reduction

Common Dimensionality Reduction Techniques

Advanced Dimensionality Reduction Techniques

#### Logistic Regression

Understanding the Basics of Logistic Regression

Evaluation Metrics

Implementing Logistic Regression

#### Decision Tree

Introduction to Decision Tree

Logic Behind Decision Tree

Implementing Decision Tree

Improving Model Performance by Pruning/Hyperparameters Tuning

#### Ensemble Models

Basics of Ensemble Techniques

Random Forest

Implementation of Bagging and Random Forest

#### Clustering (Unsupervised Learning)

Clustering

Understanding K-means

Implementation of K-means

**PROJECTS**

#### Real estate prices

Predict the real estate prices based on multiple characteristics using a regression algorithm

#### Retention rates of bank customers

Based on the bank customer information like age, gender, demographics, and past transactions, predict their retention rates

#### Loan eligibility for customers

Based on customer details like gender, education, number of dependants, and more, automate the loan eligibility process for customers