

Specialised Programme on Machine Learning – 2 Weeks

Pre-requisites

- Proficient in Python programming
- Basic understanding of statistics, linear algebra

Aim

To equip participants with a solid foundation in machine learning, enabling them to solve real-world problems using modern techniques in supervised, unsupervised and Neural Network to manage the lifecycle of machine learning models effectively.

Objective

- Understand the fundamentals and types of machine learning
- Gain hands-on experience with key machine learning libraries
- Master supervised and unsupervised learning techniques
- Develop familiarity with neural networks and deep learning basics
- Learn the essentials of model deployment and lifecycle management

Course Contents

Introduction to Machine Learning

- Machine Learning and Applications
- Types of Machine Learning: Supervised, Unsupervised and Reinforcement Learning
- Machine Learning Workflow and Key Terminologies
- Python Libraries for Machine Learning (Numpy, Pandas, Matplotlib)

Supervised Learning

- Linear Models: Simple Linear Regression, Multiple Linear Regression
- Logistic Regression and Classification Metrics
- Decision Trees and Random Forest
- Naïve Bayes Algorithm
- KNN
- Model Evaluation, Cross-Validation and Hyperparameter Tuning

Unsupervised Learning

- Clustering Techniques: K-Means, Hierarchical (Agglomerative and Divisible Algorithm)
- Dimensionality Reduction Techniques: PCA
- Association Rule (Apriori Algorithm)

Introduction to Deep Learning

- Basics of Neural Networks: Architectures and Activation Functions
- Building and Training Deep Learning Models
- Introduction to CNNs and Transfer Learning

Model Deployment

- Managing the Machine Learning Lifecycle
- Deploying Models Locally or in On-Premises Environments
- Monitoring and Updating Deployed Models