# Applied Machine Learning
# &
# Data Science Techniques

**Duration:** 03 days
**Courseware:** Unofficial

**Table of Contents**

- Feature extraction and similarity measures

2.4 Advanced Techniques

- Hybrid recommendation systems
- Deep learning-based recommenders

**Module 3: Regression Analysis**

3.1 Introduction to Regression

- Applications and use cases of regression
- Simple linear regression

3.2 Multiple Linear Regression

- Assumptions and diagnostics
- Feature selection and regularization (Lasso, Ridge)

3.3 Advanced Regression Techniques

- Polynomial regression, stepwise regression
- Non-linear regression techniques
- Handling multicollinearity and heteroscedasticity

**Module 4: Decision Systems**

4.1 Overview of Decision Systems

- Decision trees and rule-based systems
- Applications of decision systems

4.2 Decision Tree Models

- Classification and regression trees (CART)
- Pruning and tuning decision trees

4.3 Ensemble Methods

- Random forests, boosting (AdaBoost, XGBoost)

- Bagging and stacking techniques

**Module 5: Forecasting Systems**

5.1 Fundamentals of Forecasting

- Understanding time series data and trends
- Types of forecasting models and applications

5.2 Statistical Forecasting Models

- ARIMA, SARIMA models
- Seasonal decomposition

5.3 Machine Learning for Time Series Forecasting

- Prophet, LSTM, and other deep learning models
- Evaluating forecasting accuracy

**Module 6: Neural Networks**

6.1 Introduction to Neural Networks

- Basic concepts and structure of neural networks
- Activation functions, loss functions, and backpropagation

6.2 Deep Learning Models

- Convolutional Neural Networks (CNNs) for image data
- Recurrent Neural Networks (RNNs) for sequence data

6.3 Advanced Neural Network Architectures

- Transfer learning and fine-tuning
- Attention mechanisms and transformers