

Fundamentals of Machine Learning

Course Content

Lesson 1 - Introduction to Machine Learning Concepts

- Definition of ML
- ML workflow and pipelines
- Data requirements

Lesson 2 - Supervised vs Unsupervised Learning

- Differences and examples
- Applications
- Advantages and challenges

Lesson 3 - Regression Algorithms

- Linear regression
- Polynomial regression
- Evaluation metrics

Lesson 4 - Classification Algorithms

- Logistic regression
- Decision trees
- Confusion matrix

Lesson 5 - Clustering Techniques

- K-means clustering
- Hierarchical clustering
- DBSCAN

Lesson 6 - Model Evaluation Metrics

- Accuracy, precision, recall, F1
- ROC curves
- Cross-validation

Lesson 7 - Overfitting and Regularization

- Bias-variance tradeoff
- Ridge and Lasso
- Early stopping

Lesson 8 - Feature Engineering Techniques

- Encoding categorical variables
- Feature scaling
- Feature selection

Lesson 9 - Ensemble Learning Methods

- Random forests
- Gradient boosting
- Bagging vs boosting

Lesson 10 - Model Deployment Basics

- Exporting models
- Model serving frameworks
- API-based deployment

Capstone Project

- Build, evaluate, and deploy a supervised ML model.