

Machine Learning

Introduction to Machine Learning	<ul style="list-style-type: none"> What is Machine Learning? Types of Machine Learning (Supervised, Unsupervised, Reinforcement Learning) Applications of Machine Learning Machine Learning Workflow
Data Preprocessing	<ul style="list-style-type: none"> Data Collection and Cleaning Data Exploration and Visualization Data Transformation and Feature Engineering Handling Missing Data
Supervised Learning	<ul style="list-style-type: none"> Linear Regression Logistic Regression Decision Trees Random Forest Support Vector Machines k-Nearest Neighbors Naive Bayes Model Evaluation and Metrics Cross-Validation
Unsupervised Learning	<ul style="list-style-type: none"> Clustering (K-Means, Hierarchical Clustering) Dimensionality Reduction (PCA, t-SNE) Association Rules Anomaly Detection Recommender Systems
Deep Learning	<ul style="list-style-type: none"> Introduction to Neural Networks Feedforward Neural Networks Convolutional Neural Networks (CNNs) Recurrent Neural Networks (RNNs) Transfer Learning Deep Learning Frameworks (TensorFlow, PyTorch)
Natural Language Processing (NLP)	<ul style="list-style-type: none"> Introduction to NLP Text Preprocessing Word Embeddings (Word2Vec, GloVe) Recurrent Neural Networks for NLP Sequence-to-Sequence Models (LSTMs, GRUs) Transformer Models (BERT, GPT)
Reinforcement Learning	<ul style="list-style-type: none"> Introduction to Reinforcement Learning Markov Decision Processes Q-Learning

	Policy Gradient Methods Deep Reinforcement Learning
Model Deployment and Production	Model Deployment Options Building REST APIs for Models Model Monitoring and Maintenance Ethics and Bias in Machine Learning
Special Topics	Time Series Analysis and Forecasting Image Classification and Object Detection Advanced NLP Applications Explainable AI AutoML (Automated Machine Learning)
Capstone Project	Students work on a real-world machine learning project, applying concepts learned throughout the course.