Machine Learning

Build, evaluate and deploy machine learning models in Python, from data prep to MLOps.

DURATION	FORMAT	LEVEL	LABS
45 hours	Onsite, online or hybrid	Intermediate	Cloud sandbox included

About this programme

A complete machine learning programme covering the maths, data preparation, core supervised and unsupervised algorithms, model evaluation and an introduction to deep learning, NLP, computer vision and MLOps, anchored in hands-on Python projects.

Who it is for: Developers, analysts and aspiring data scientists comfortable with Python

What your team will be able to do

- Choose the right type of learning for a business problem
- Prepare data and engineer features that improve model performance
- Build regression, classification and clustering models with scikit-learn
- Evaluate models with the right metrics and cross-validation
- Plan deployment and lifecycle management with MLOps

Before you start

- Working Python, including lists, dictionaries and functions
- School-level statistics: mean, variance and basic probability

Course outline

1. Machine learning foundations

- ML as a subfield of AI and its applications across industries
- Supervised, unsupervised, semi-supervised and reinforcement learning
- The ML workflow from data collection to deployment and monitoring
- Maths essentials: linear algebra, calculus, probability and statistics

2. Data handling and preprocessing

- Collecting data from APIs, databases and web scraping
- Cleaning data: missing values, outliers and formatting
- Feature selection and feature engineering
- Visualising trends and patterns with Matplotlib and Seaborn

3. Core algorithms

- Regression: linear, multiple and logistic
- Classification: decision trees, support vector machines and naive Bayes
- Clustering: k-means, hierarchical and DBSCAN
- Dimensionality reduction with PCA
- Reinforcement learning and neural network basics

4. Model evaluation and selection

- Metrics: accuracy, precision, recall, F1, confusion matrix and MSE
- Cross-validation to reduce bias and overfitting
- The bias-variance trade-off

5. Advanced topics

- Deep learning with CNNs and RNNs
- NLP techniques and language models such as BERT and GPT
- Computer vision and time series forecasting
- Deployment at scale with Spark and cloud platforms, and MLOps

6. Applied projects

- Industry case studies
- Hands-on projects with NumPy, Pandas, scikit-learn, TensorFlow and PyTorch

Sample schedule

6 days onsite, or 12 half-day sessions online. We fit days and session lengths to your team's calendar.

Day 1	8 h	Machine learning foundations
Day 2	8 h	Data handling and preprocessing
Day 3	8 h	Core algorithms
Day 4	8 h	Core algorithms (continued); Model evaluation and selection
Day 5	8 h	Model evaluation and selection (continued); Advanced topics
Day 6	5 h	Advanced topics (continued); Applied projects

Assessment and certification

How learning is checked

- A short knowledge check on day one and again at the end, so you can see each person's progress
- Graded hands-on labs in every module, reviewed by the trainer
- A final exercise that applies the programme to a problem like your team's own

Certificate and exams

- Participants who complete the programme receive a Cognitive Networks AI certificate of completion.

Formats and cohort size

- Onsite: At your office or a venue you choose, in full days.
- Online, live: Instructor-led over video, usually in half-day sessions so people can keep up with work.
- Hybrid: Some days in a room together, the rest online. Useful when a team works across cities.

Cohort size: 15 to 25 people per trainer. Larger teams run as parallel cohorts on the same outline, so everyone learns the same thing.

Pricing: We quote per cohort, based on duration, format and number of cohorts. There is no per-seat price list: tell us your team and we send a proposal within one business day.

Bring this programme to your team

Request a proposal at cognitivenetworks.ai/contact?programme=machine-learning

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