

Python + AIML Training Course Outline

Total Duration: 45 Hours

Prerequisite: Basic Knowledge of Python

Target Audience: Fresh Graduates (B.Sc, B.Tech, B.E.)

Course Objective:

To provide an in-depth, practical foundation in Python programming and Artificial Intelligence & Machine Learning (AIML) concepts to help participants secure placements in technical roles such as Data Scientist, AI/ML Engineer, Data Analyst, and Python Developer.

Course Highlights:

- Comprehensive Hands-on Sessions
- Real-world Project Implementation
- Placement-Oriented Approach
- Regular Assessments & Capstone Project
- Recorded Sessions for Revision

Detailed Tabular Schedule (45 Hours)

Session	Module/Topic	Hours	Description / Hands-On Activities
1	Python Refresher & Environment Setup	3	Python installation, IDE setup, syntax, indentation, basic programs
2	Python: Variables, Data Types, Operators	2	Numeric, strings, lists, tuples, dictionaries, sets, operators, type conversions
3	Python: Control Structures & Functions	2	Conditional statements, loops, functions, lambda expressions
4	Python: OOP Concepts & Exception Handling	3	Classes, inheritance, polymorphism, encapsulation, exceptions, try-except-finally
5	Python: File Handling, Modules, and Packages	2	Reading/Writing files (CSV, JSON), importing packages, creating modules
6	Python Libraries: NumPy & Pandas	2	Numerical operations, data manipulation, EDA
7	Python Libraries: Matplotlib & Seaborn	2	Data visualization techniques and hands-on plotting
8	Introduction to AI & ML	2	AI vs. ML vs. DL, Types of ML (Supervised, Unsupervised, Reinforcement)

Session	Module/Topic	Hours	Description / Hands-On Activities
9	Data Preprocessing Techniques	2	Data cleaning, feature scaling, handling missing values
10	Supervised Learning: Regression	2	Linear regression, MSE, R ² , hands-on project
11	Supervised Learning: Classification (Part 1)	2	Logistic regression, confusion matrix, precision, recall, hands-on
12	Supervised Learning: Classification (Part 2)	2	Decision Trees, Random Forest, KNN, hands-on with case studies
13	Supervised Learning: Advanced Models	2	Support Vector Machines (SVM), hands-on with real datasets
14	Unsupervised Learning Techniques	2	K-Means clustering, hierarchical clustering, PCA, hands-on
15	Model Evaluation & Hyperparameter Tuning	2	Cross-validation, GridSearch, model selection, ROC/AUC
16	Introduction to Deep Learning	2	Neural network concepts, perceptron, multilayer networks, backpropagation
17	Deep Learning: Convolutional Neural Networks (CNNs)	2	CNN architecture, convolution, pooling, hands-on image classification
18	Deep Learning: Recurrent Neural Networks (RNNs)	2	LSTM, GRU, hands-on time-series data and text data
19	Natural Language Processing (NLP)	2	Text preprocessing, tokenization, embedding, sentiment analysis
20	Advanced NLP Models & Transformers	2	BERT basics, Transformers, text classification/summarization
21	Computer Vision with OpenCV	2	Image processing, edge detection, segmentation, object detection basics
22	Introduction to Reinforcement Learning (RL)	2	RL concepts, Markov Decision Processes (MDPs), Q-learning
23	AI Model Deployment Techniques	2	Flask/FastAPI, deploying ML models, API integration
24	Cloud Deployment & MLOps Basics	2	AWS/GCP/Azure basics, CI/CD, Model monitoring
25	Ethics, Privacy & Security in AI	1	Ethical AI, responsible ML, data privacy, GDPR

Session	Module/Topic	Hours	Description / Hands-On Activities
26	Project & Placement Preparation (Technical Skills)	2	Resume building, AI/ML coding challenges, mock technical interviews
27	Placement Preparation (Professional & HR Skills)	1	Behavioral interview prep, LinkedIn profile optimization, networking
28	Capstone Project Initiation	1	Project selection, data gathering, defining objectives
29	Capstone Project Execution - Part 1	2	Data exploration, model selection, initial training
30	Capstone Project Execution - Part 2	2	Hyperparameter tuning, validation, model optimization
31	Capstone Project Execution - Part 3 (Deployment)	2	Model deployment, API setup, user interface integration
32	Capstone Project Presentation & Review	2	Project presentation, feedback session.

Modules & Tools Covered:

- Python (Core Language)
 - NumPy, Pandas, Matplotlib, Seaborn
 - Scikit-learn, TensorFlow/Keras
 - OpenCV (Computer Vision)
 - NLTK, Transformers (NLP)
 - Flask/FastAPI (Deployment)
 - AWS/GCP/Azure (Basics of Cloud)
 - Git & GitHub (Version Control)
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Assessment Methodology:

- Mid-Course Assessment (Theory + Practical)
 - Capstone Project Evaluation (End of Course)
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