Training Course on Python for Artificial Intelligence and Machine Learning

Professional Development Training Course Outline

Category	Artificial Intelligence And Block Chain	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Embark on a transformative journey into the core of modern technology with our comprehensive training course: **Python for Artificial Intelligence and Machine Learning**. This program is meticulously designed to equip you with the fundamental and advanced **Python programming skills** essential for navigating the dynamic landscapes of **artificial intelligence (AI)** and **machine learning (ML)**. Through a blend of theoretical knowledge and hands-on practical exercises, you will master the art of leveraging Python's powerful libraries and frameworks to develop intelligent systems and extract meaningful insights from data. This course addresses the burgeoning demand for professionals proficient in **AI and ML development**, offering a clear pathway to a rewarding career in this cutting-edge field.

Our curriculum delves into the critical aspects of **data manipulation and analysis**, a cornerstone of both AI and ML. You will gain expertise in utilizing industry-standard Python libraries such as NumPy, Pandas, and Scikit-learn for **data preprocessing**, **feature engineering**, and building robust **machine learning models**. Furthermore, the course explores the exciting domain of **deep learning**, introducing you to frameworks like TensorFlow and Keras for developing sophisticated **neural networks**. By the end of this training, you will possess a strong foundation in **Python for data science**, enabling you to tackle real-world challenges in areas such as **computer vision**, **natural language processing (NLP)**, and **predictive analytics**

Programme Curriculum

Training Course on Python for Artificial Intelligence and Machine Learning

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Course Duration

10 days

Course Objectives

Upon successful completion of this training course, participants will be able to:

1. Master the fundamentals of **Python programming language** and its core syntax.
2. Develop proficiency in using **NumPy for numerical computations** and array manipulation.
3. Gain expertise in **Pandas for data analysis** and working with data structures.
4. Implement effective **data visualization techniques** using Matplotlib and Seaborn.
5. Understand the principles of **statistical analysis with Python**.
6. Apply various **data preprocessing techniques** for machine learning.
7. Perform **feature engineering and selection** to optimize model performance.
8. Build and evaluate a range of **supervised learning algorithms**
9. Implement **unsupervised learning techniques** for clustering and dimensionality reduction.
10. Explore the concepts and applications of **deep learning models**.
11. Utilize **TensorFlow and Keras** for building and training neural networks.
12. Apply Python for tasks in **natural language processing**
13. Develop practical skills in building **AI and ML applications**.

Organizational Benefits

Organizations that invest in this training program can expect several key benefits:

- Equipping employees with AI and ML skills fosters a culture of innovation, leading to the development of new products, services, and processes.
- AI and ML tools can automate tasks, optimize workflows, and improve decision-making, resulting in increased operational efficiency.
- Trained professionals can leverage data to extract valuable insights, enabling better strategic planning and informed business decisions.
- Organizations with a skilled AI and ML workforce gain a significant competitive edge in the rapidly evolving technological landscape.
- Offering cutting-edge training programs can attract and retain highly skilled employees seeking opportunities in AI and ML.

- Automation and optimized processes driven by AI and ML can lead to significant cost savings in the long run.
- AI-powered tools can personalize customer interactions, improve service quality, and enhance overall customer satisfaction.
- Machine learning models can be used to identify and predict potential risks, allowing organizations to take proactive measures.

Target Audience

This training course is designed for individuals in the following roles and with the following interests:

1. **Data Scientists** and **Machine Learning Engineers**.
2. Software Developers.
3. Data Analysts.
4. Researchers and Academics.
5. Business Analysts and Managers
6. Students and Recent Graduates.
7. IT Professionals.
8. Anyone with a foundational understanding of programming concepts and a keen interest in **AI and ML**.

Course Outline

Module 1: Python Fundamentals for Data Science

- Introduction to Python: Syntax, Data Types, and Control Structures.
- Working with Functions, Modules, and Packages in Python.
- Object-Oriented Programming (OOP) Concepts in Python.
- File Handling and Input/Output Operations in Python.
- Error Handling and Exception Management in Python.

Module 2: Numerical Computing with NumPy

- Introduction to NumPy Arrays: Creation, Indexing, and Slicing.
- Mathematical Operations on NumPy Arrays.
- Linear Algebra with NumPy: Matrix Operations and Functions.
- Random Number Generation using NumPy.
- Broadcasting in NumPy and its Applications.

Module 3: Data Analysis with Pandas

- Introduction to Pandas Series and DataFrames.
- Data Manipulation: Filtering, Sorting, and Grouping.
- Handling Missing Data in Pandas.
- Data Aggregation and Pivot Tables.
- Reading and Writing Data from Various File Formats (CSV, Excel, etc.).

Module 4: Data Visualization with Matplotlib and Seaborn

- Introduction to Matplotlib: Creating Basic Plots and Charts.
- Customizing Plots: Labels, Titles, Legends, and Styles.
- Different Types of Plots: Line Plots, Scatter Plots, Bar Charts, Histograms.
- Introduction to Seaborn: Statistical Data Visualization.

- Creating Advanced and Informative Visualizations.

Module 5: Statistical Analysis with Python

- Descriptive Statistics: Measures of Central Tendency and Dispersion.
- Probability Distributions and Hypothesis Testing.
- Correlation and Regression Analysis.
- Time Series Analysis Basics.
- Applying Statistical Tests using SciPy.

Module 6: Data Preprocessing for Machine Learning

- Handling Missing Values: Imputation Techniques.
- Dealing with Outliers: Detection and Treatment.
- Feature Scaling: Standardization and Normalization.
- Encoding Categorical Variables.
- Data Transformation Techniques.

Module 7: Feature Engineering and Selection

- Creating New Features from Existing Data.
- Polynomial Features and Interactions.
- Feature Importance and Selection Techniques.
- Dimensionality Reduction using PCA.
- Addressing Feature Sparsity.

Module 8: Supervised Learning - Regression

- Introduction to Regression Analysis.
- Linear Regression: Simple and Multiple Linear Regression.
- Polynomial Regression and Non-linear Regression Models.
- Model Evaluation Metrics for Regression.
- Regularization Techniques: Ridge and Lasso Regression.

Module 9: Supervised Learning - Classification

- Introduction to Classification Problems.
- Logistic Regression.
- K-Nearest Neighbors (KNN) Algorithm.
- Support Vector Machines (SVM).
- Decision Trees and Random Forests.

Module 10: Model Evaluation and Selection

- Splitting Data into Training, Validation, and Test Sets.
- Cross-Validation Techniques.
- Evaluation Metrics for Classification (Accuracy, Precision, Recall, F1-Score).
- ROC and AUC Curves.
- Hyperparameter Tuning using Grid Search and Randomized Search.

Module 11: Unsupervised Learning

- Introduction to Unsupervised Learning.
- Clustering Algorithms: K-Means, DBSCAN, Hierarchical Clustering.

- Dimensionality Reduction Techniques: PCA, [1] t-SNE.
- Association Rule Mining.
- Anomaly Detection Techniques.

Module 12: Introduction to Deep Learning

- Fundamentals of Neural Networks: Perceptrons and Activation Functions.
- Multi-Layer Perceptrons (MLPs) and Backpropagation.
- Introduction to Deep Learning Frameworks: TensorFlow and Keras.
- Building and Training Simple Neural Networks.
- Understanding Overfitting and Regularization in Deep Learning.

Module 13: Convolutional Neural Networks (CNNs)

- Introduction to Computer Vision and Image Processing.
- Convolutional Layers, Pooling Layers, and Activation Functions in CNNs.
- Building CNN Architectures for Image Classification.
- Transfer Learning in CNNs.
- Applications of CNNs.

Module 14: Recurrent Neural Networks (RNNs) and Natural Language Processing (NLP)

- Introduction to Sequential Data and Natural Language Processing.
- Recurrent Neural Network Architectures: RNNs, LSTMs, GRUs.
- Text Preprocessing Techniques.
- Word Embeddings (e.g., Word2Vec, GloVe).
- Applications of RNNs in NLP (e.g., Text Classification, Sentiment Analysis).

Module 15: Building and Deploying AI/ML Applications

- Overview of AI/ML Project Lifecycle.
- Model Persistence and Saving Trained Models.
- Introduction to Deployment Options (Cloud, Local).
- Basic Concepts of API Development for Model Serving.
- Ethical Considerations in AI and ML.

Training Methodology

Our training methodology incorporates a blended learning approach to maximize engagement and knowledge retention:

- **Interactive Lectures:** Engaging sessions covering theoretical concepts with real-world examples and case studies.
- **Hands-on Labs:** Practical exercises and coding assignments to reinforce learning and build practical skills.
- **Project-Based Learning:** Real-world projects that allow participants to apply their knowledge and develop a portfolio.
- **Collaborative Learning:** Group discussions and team projects to foster peer learning and problem-solving.
- **Q&A Sessions:** Dedicated time for participants to ask questions and clarify doubts.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com