

Artificial Intelligence with Python

Go from writing your first Python line to building and deploying real machine-learning models, and packaging that skill into freelance income.

Duration: 3 months (includes a freelancing module)

Certificate: NUEXUS AI with Python completion certificate

Format: Online or onsite, 1-on-1 or batch

NUEXUS certificate on completion

OVERVIEW

Artificial Intelligence with Python is a hands-on, three-month program that takes you from Python fundamentals through to building, training, and evaluating real machine-learning and deep-learning models. You work in labs and mini-projects the whole way, using the exact tools professionals use (NumPy, pandas, scikit-learn, and TensorFlow/Keras), and finish by shipping a portfolio project and learning how to turn these skills into freelance work. It is mentor-led by certified trainers and available Online from anywhere or Onsite in Islamabad, in batch or 1-on-1 format. The goal is practical capability: understanding not just how to run a model, but why it works and where it fits a real problem.

SKILLS YOU WILL GAIN

Python Programming

Data Analysis

NumPy & Pandas

Machine Learning

Deep Learning

LLM Integration

Automation

APIs

Freelancing Skills

Project Building

WHAT YOU WILL BE ABLE TO DO

- Write clean, working Python and use core libraries (NumPy and pandas) to load, clean, and manipulate real datasets
- Explore and visualize data to find patterns and communicate insights using Matplotlib and Seaborn
- Build, train, and evaluate supervised machine-learning models (regression and classification) with scikit-learn
- Apply unsupervised techniques like clustering, and correctly split, validate, and tune models to avoid overfitting
- Build and train basic neural networks for image and text tasks using TensorFlow/Keras
- Package a complete, portfolio-ready AI project and understand how to price, pitch, and deliver it as freelance work

WHO IT IS FOR

- Complete beginners who want a structured, from-scratch path into AI and machine learning without a prior coding background
- Students and fresh graduates aiming to add a practical, in-demand AI skill to their CV and portfolio
- Working professionals (analysts, developers, IT staff) who want to move into data science or ML roles
- Aspiring freelancers who want to offer AI, automation, and data services and land their first paid projects
- Entrepreneurs and domain experts who want to build and validate their own AI-powered ideas

PREREQUISITES

- None for the fundamentals; this course is beginner friendly and starts from Python basics
- Comfort using a computer, installing software, and working with files and folders
- Basic school-level mathematics; any deeper statistics and linear-algebra concepts are taught as they are needed
- A laptop with a stable internet connection (a free Google Colab account is used so no high-end hardware is required)

WHAT'S INCLUDED

- Mentor-led live sessions, online or onsite, in batch or 1-on-1
- Hands-on labs and real-world projects, not slides alone
- Recordings of your own sessions to revisit anytime
- Exam-aligned study material and practice questions
- Doubt-clearing and revision support through the program
- A verifiable NUEXUS completion certificate
- Career and next-step guidance after you finish

COURSE CURRICULUM

1 Python Foundations for AI

Setting up Python, Jupyter, and Google Colab

Variables, data types, operators, and control flow

Functions, loops, and error handling

Lists, dictionaries, tuples, and sets

Writing clean, reusable code and using notebooks effectively

2 Data Handling with NumPy and pandas

NumPy arrays and vectorized operations

pandas Series and DataFrames

Loading data from CSV, Excel, and other sources

Cleaning data: missing values, duplicates, and type conversion

Filtering, grouping, merging, and reshaping datasets

3 Data Visualization and Exploratory Analysis

Plotting with Matplotlib and Seaborn

Distributions, correlations, and outlier detection

Exploratory Data Analysis (EDA) workflow

Turning raw data into insights and readable charts

Telling a clear story with data

4 Math and Statistics for Machine Learning

Descriptive statistics and probability basics

Intuition for vectors, matrices, and linear algebra

Understanding distributions and sampling

Correlation vs causation

Gradient and cost-function intuition (taught visually, no heavy proofs)

5 Supervised Learning Fundamentals

The machine-learning workflow end to end

Linear and logistic regression

Train/test split and the concept of generalization

Decision trees and k-nearest neighbors

Evaluation metrics: accuracy, precision, recall, F1, and confusion matrix

6 Model Building and Tuning with scikit-learn

Feature engineering, scaling, and encoding

Pipelines for repeatable workflows

Overfitting, underfitting, and the bias-variance tradeoff

Cross-validation and hyperparameter tuning

Ensemble methods such as Random Forest and Gradient Boosting

7 Unsupervised Learning

Clustering with K-Means

Hierarchical clustering intuition

Dimensionality reduction with PCA

Finding structure in unlabeled data

Practical use cases like customer segmentation

8 Introduction to Deep Learning

How neural networks learn (neurons, weights, activation)

Building models with TensorFlow and Keras

Training a basic image classifier

Simple text and NLP tasks

Using pre-trained models and where deep learning fits vs classical ML

9 Capstone AI Project

Choosing a real problem and dataset

Full pipeline: data to trained, evaluated model

Interpreting and presenting results

Documenting the project for your portfolio and GitHub

Instructor review and feedback

10 Freelancing and Career Launch

Building an AI portfolio that wins clients

Setting up profiles on freelance platforms (Upwork, Fiverr, and similar)

Scoping, pricing, and proposing AI and data projects

Communicating with clients and delivering work professionally

Using AI tools responsibly and continuing to learn after the course

CAREER OUTCOMES

AI Developer

Python Developer

Machine Learning Engineer

Automation Engineer

Freelance AI Developer

CERTIFICATION

On completing the coursework, labs, and capstone project, you earn the NUEXUS AI with Python completion certificate, which recognizes the practical skills you have demonstrated throughout the program. Assessment is project and lab based rather than a single high-stakes exam; the certificate reflects completed, reviewed work, and while the course is designed to make you genuinely job-ready and freelance-ready, no certificate or course can guarantee a job or a specific income.