



PYTHON TRAINING

Advanced Python Machine Learning Course

Master advanced Python ML algorithms and build intelligent systems. Unlock new career opportunities in AI.

DURATION

2 hours

LEVEL

Intermediate

FORMAT

Instructor-Led

- Globally Recognized Certification

- Expert-Led Hands-On Training

- Flexible Scheduling

Computer Pride | 1st Floor, ICEA Building, Kenyatta Avenue, Nairobi | www.computer-pride.co.ke

COURSE OVERVIEW

This Advanced Python Machine Learning Course is meticulously designed for data scientists and developers who have a foundational understanding of Python and machine learning concepts and are eager to delve into more sophisticated techniques. You will gain expertise in building robust, high-performance machine learning models using Python's leading libraries such as scikit-learn, TensorFlow, Keras, and PyTorch. The curriculum progresses from advanced model optimization and ensemble methods to the intricacies of deep learning architectures and practical model deployment strategies. You will explore critical subjects like hyperparameter tuning, advanced feature engineering, and the ethical considerations surrounding AI, ensuring you can tackle complex real-world challenges. This course focuses heavily on practical application, equipping you with the ability to not only develop state-of-the-art predictive models but also to deploy and manage them effectively in production environments. By completing this program, you will significantly enhance your professional toolkit, making you a more valuable asset in any data-driven organization and preparing you for specialized roles in the rapidly evolving field of artificial intelligence.

Duration	2 hours
Level	Intermediate
Vendor	Python

COURSE CURRICULUM

01 Module 1: Advanced Model Ensembling & Optimization

- Gradient Boosting Machines (XGBoost, LightGBM, CatBoost)
- Stacking and Blending models
- Bayesian Optimization for Hyperparameter Tuning
- Advanced Cross-validation strategies (Group K-Fold, Stratified K-Fold)
- Feature Importance and Selection techniques (Permutation Importance, SHAP values)

02 Module 2: Deep Learning Architectures with TensorFlow/Keras

- Convolutional Neural Networks (CNNs) for Computer Vision
- Recurrent Neural Networks (RNNs) and LSTMs for Sequence Data
- Transfer Learning and Fine-tuning pre-trained models
- Custom Layer Development and Model Subclassing
- Advanced Regularization (Dropout, L1/L2, Batch Normalization)

03 Module 3: PyTorch Fundamentals & Advanced Deep Learning

- Introduction to PyTorch: Tensors, Autograd, and nn.Module
- Building and Training Custom Deep Learning Models in PyTorch
- Data Loaders and Pipelines in PyTorch
- Implementing Advanced Architectures (e.g., Transformers basics, GANs concepts)
- Distributed Training and Model Parallelism (conceptual overview)

04 Module 4: MLOps and Model Deployment Strategies

- Model Serialization and Versioning (Pickle, Joblib, ONNX)
- Building RESTful APIs for Model Inference with Flask/FastAPI
- Containerization of ML Models using Docker
- Introduction to Model Monitoring and Logging
- Basic concepts of CI/CD for Machine Learning

05 Module 5: Specialized ML Applications & Ethical AI

- Time Series Forecasting Models (ARIMA, Prophet, LSTM-based approaches)
- Anomaly Detection Techniques (Isolation Forest, One-Class SVM)
- Introduction to Natural Language Processing with advanced embeddings (Word2Vec, BERT basics)
- Explainable AI (XAI) with LIME and SHAP
- Addressing Bias, Fairness, and Transparency in Machine Learning Models

CAREER PATHWAYS

Graduates of this program are prepared for the following roles:

- > **Senior Machine Learning Engineer**
- > **AI/ML Solutions Architect**
- > **Lead Data Scientist (with ML Specialization)**

FREQUENTLY ASKED QUESTIONS

Q: What are the essential prerequisites for enrolling in this Advanced Python Machine Learning Course?

To get the most out of this course, participants should have a solid intermediate-level proficiency in Python programming, including familiarity with data structures, object-oriented programming, and common libraries like NumPy and Pandas. A foundational understanding of core machine learning concepts, algorithms (e.g., linear regression, decision trees, k-means), and basic statistics is also crucial.

Q: How will this course specifically help me transition into a specialized Machine Learning Engineer or AI Solutions Architect role?

This course is specifically designed to bridge the gap between theoretical knowledge and practical application, a key requirement for advanced roles. You will gain hands-on experience with production-grade libraries like TensorFlow, Keras, and PyTorch, learn to build robust ensemble models, and master critical MLOps principles like model deployment via APIs and containerization. These skills are highly sought after by employers looking for engineers who can not only build models but also operationalize them effectively within an enterprise architecture.

Q: What kind of real-world projects or case studies will I engage with to solidify my advanced ML skills during the course?

Throughout the course, you will work on several practical, real-world inspired projects and case studies. These include developing a highly accurate prediction system using advanced ensemble methods, building and fine-tuning a deep learning model for image classification or natural language processing, deploying a machine learning model as a scalable API, and exploring techniques for explaining model predictions and mitigating bias in a dataset. These projects are designed to simulate industry challenges and provide tangible portfolio pieces.

ABOUT COMPUTER PRIDE

**computerpride*****East Africa's Premier IT Training Center***

With over 15 years of excellence, Computer Pride delivers globally recognized certification programs from leading technology vendors. Located on Kenyatta Avenue in Nairobi's CBD, our state-of-the-art facilities and expert instructors have empowered thousands of professionals across East Africa.

15+

Years of Excellence

10,000+

Professionals Trained

50+

Vendor Certifications

READY TO ENROL?

Take the next step in your technology career.

Location

1st Flr, ICEA Building
Kenyatta Ave, Nairobi

Email

info@computer-pride.co.ke

Phone

+254 705 900 900

www.computer-pride.co.ke