Professional Artificial Intelligence and Machine Learning Training Course



28 Dec 2026 - 01 Jan 2027

Cape town

4600 € (Per Person)

Ref: #AI7145_291300

Course Introduction / Overview:

This comprehensive training course provides a deep dive into the world of Artificial Intelligence and Machine Learning, designed to transform participants from beginners into proficient practitioners. In an era where AI is reshaping industries, understanding its core principles and applications is no longer optional but essential for professional growth. This program, offered by BIG BEN Training Center, covers the entire spectrum of AI, from foundational theories to advanced practical implementation. We will explore the concepts detailed by pioneers like Geoffrey Hinton and in seminal texts such as "Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig. The curriculum is meticulously structured to build a strong theoretical foundation in machine learning algorithms, neural networks, and deep learning, while emphasizing hands-on application. Participants will learn to build, train, and deploy AI models to solve real-world problems, gaining the practical skills needed to drive innovation. This course is not just about learning algorithms; it is about developing an AI-driven mindset to strategically leverage data, automate processes, and create intelligent solutions that deliver tangible business value and a competitive edge in the global market.

Target Audience / This training course is suitable for:

- IT Professionals and Software Developers.
- Data Analysts and Data Scientists.
- Business Analysts and Product Managers.
- Project Managers and Team Leaders.
- Engineers and Technical Consultants.
- Academics and Researchers in technology fields.
- Marketing and Business Intelligence Professionals.
- Anyone aspiring to build a career in Artificial Intelligence.

Target Sectors and Industries:

- Technology and Software Development.
- Banking, Finance, and Insurance Services.
- Healthcare and Pharmaceutical Industries.
- Retail and E-commerce.
- Manufacturing and Automation.
- Telecommunications and Media.
- Government Agencies and Public Sector Organizations.
- Consulting and Professional Services.

Target Organizations Departments:

- Information Technology (IT) and Software Engineering.
- Research and Development (R&D).
- Data Analytics and Business Intelligence.
- Marketing and Customer Insights.
- Operations and Supply Chain Management.
- Product Development and Management.
- Strategy and Innovation.
- Finance and Risk Management.

Course Offerings:

By the end of this course, the participants will have able to:

- Master the fundamental concepts of artificial intelligence, machine learning, and deep learning.
- Develop proficiency in Python programming for data analysis and AI model development.
- Implement a wide range of supervised and unsupervised machine learning algorithms.
- Build, train, and evaluate neural networks for complex problem-solving.
- Apply Natural Language Processing (NLP) techniques to analyze and interpret text data.
- Utilize computer vision models for image recognition and object detection tasks.
- Understand the strategic implications of AI for business transformation and innovation.
- Evaluate and address the ethical considerations and potential biases in AI systems.
- Manage the end-to-end lifecycle of an AI project, from conception to deployment.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, immersive, and practical, ensuring that participants gain tangible skills they can apply immediately. This course moves beyond traditional lectures, employing a blended learning approach that combines expert-led instruction with extensive hands-on labs and real-world projects. Participants will engage in coding exercises, data analysis tasks, and model-building sessions using industry-standard tools and libraries. A significant portion of the course is dedicated to collaborative workshops and group projects, fostering teamwork and problem-solving skills. We will analyze relevant case studies from various industries to understand how AI is being successfully implemented to solve complex business challenges. The learning environment encourages active participation through Q&A sessions, open discussions, and peer-to-peer feedback. Our experienced instructors provide continuous guidance and personalized mentorship, ensuring that each participant grasps the core concepts and can confidently navigate the complexities of AI development. This experiential learning approach guarantees a deep and lasting understanding of artificial intelligence and its practical applications.

Course Agenda (Course Units):

Unit One: Foundations of AI and Machine Learning with Python

- Introduction to Artificial Intelligence and its historical context.
- Understanding the different types of machine learning: supervised, unsupervised, and reinforcement.
- Setting up the Python environment for data science and AI.
- Mastering Python fundamentals for data manipulation.
- Introduction to core libraries: NumPy for numerical operations.
- Working with Pandas for data analysis and wrangling.
- Fundamentals of data visualization with Matplotlib and Seaborn.

Unit Two: Supervised and Unsupervised Learning Algorithms

- Understanding linear and logistic regression for predictive modeling.
- Implementing classification algorithms like K-Nearest Neighbors and Support Vector Machines.
- Building and evaluating decision trees and random forests.
- Exploring clustering techniques including K-Means and hierarchical clustering.
- Applying dimensionality reduction with Principal Component Analysis (PCA).
- Mastering model evaluation metrics for classification and regression.
- Techniques for cross-validation and hyperparameter tuning.

Unit Three: Deep Learning and Artificial Neural Networks

- Introduction to the theory behind artificial neural networks.
- Understanding perceptron's, activation functions, and backpropagation.
- Building deep neural networks using TensorFlow and Kera's.
- Exploring Convolutional Neural Networks (CNNs) for image processing.
- Understanding the architecture and applications of Recurrent Neural Networks (RNNs).
- Techniques for preventing overfitting in deep learning models.
- Hands-on project: building a neural network for a classification task.

Unit Four: Advanced AI: Natural Language Processing and Computer Vision

- Fundamentals of Natural Language Processing (NLP).
- Techniques for text preprocessing: tokenization, stemming, and lemmatization.
- Implementing sentiment analysis and text classification models.
- Introduction to topic modeling with Latent Dirichlet Allocation (LDA).
- Core concepts of computer vision and image processing.
- Applying CNNs for image recognition and object detection.
- Exploring transfer learning with pre-trained models.

Unit Five: AI Strategy, Ethics, and Capstone Project

- Developing a strategic framework for implementing AI in business.
- Understanding the importance of MLOps for deploying and managing models.
- Addressing ethical considerations, bias, and fairness in AI.
- Ensuring transparency and interpretability of AI models.
- Capstone project planning and problem definition.
- End-to-end development of an AI solution for a real-world problem.
- Final project presentation and peer review session.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

As AI becomes more autonomous, how do we design systems that align with human values and ensure ethical decision-making in unforeseen circumstances?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by offering a holistic and integrated curriculum that bridges the gap between theoretical knowledge and practical, real-world application. Unlike programs that focus solely on the technical aspects of coding algorithms, our approach emphasizes the strategic business context of AI. We dedicate significant time to exploring how AI-driven solutions can create value, solve critical business problems, and drive innovation. The curriculum is uniquely structured to cover the entire AI project lifecycle, from data preparation and model development to deployment and ethical considerations, providing a comprehensive, end-to-end perspective. Furthermore, the course places a strong emphasis on AI ethics, fairness, and bias, preparing participants to be responsible AI practitioners who can build trustworthy and transparent systems. The capstone project is not a generic exercise but a challenge designed to simulate a real-world business scenario, compelling participants to apply their technical skills, strategic thinking, and problem-solving abilities to deliver a tangible and impactful solution. This blend of technical depth, strategic insight, and ethical grounding provides a uniquely robust and relevant learning experience.