



Digital Transformation and Innovation

Advanced Machine Learning and Artificial Intelligence

Course Introduction

In this comprehensive 5-day training course, participants will delve into the fascinating world of AI and equip them with the knowledge and tools to excel in this rapidly evolving domain. Throughout the program, participants will cover the fundamental principles and advanced techniques of machine learning, focusing on neural networks, deep learning, natural language processing, and reinforcement learning. By the end of the course, they will have hands-on experience with building and training state-of-the-art AI models, and will be prepared to tackle real-world challenges in diverse industries. Moreover, they will examine the ethical considerations surrounding AI development, ensuring that they are well-versed in creating responsible and unbiased AI solutions.

Target Audience

- Business and technology leaders
- Business Unit Managers
- Business Development Consultants
- General Managers / Regional Managers
- Senior and mid-level leaders
- individual leaders of all levels in the organization
- Art Director
- Marketing Consultants
- Marketing Development Manager

Learning Objectives

- Develop a comprehensive understanding of advanced machine learning and artificial intelligence concepts, techniques, and algorithms.

- Gain hands-on experience in building and training sophisticated neural networks for image recognition, natural language processing, and reinforcement learning applications.
- Learn to implement state-of-the-art models, such as Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Generative Adversarial Networks (GANs), and more.
- Explore ethical considerations and best practices in AI development to ensure responsible and unbiased AI solutions.
- Acquire the skills to address real-world challenges and stay up-to-date with future trends
- in the ever-evolving field of AI.

Course Outline

• Day 01

Foundations of Machine Learning

- Introduction to Advanced Machine Learning and Artificial Intelligence
- Review of Machine Learning Basics (Supervised, Unsupervised, Reinforcement Learning)
- Advanced Regression Techniques (Ridge, Lasso, Elastic Net)
- Decision Trees and Ensemble Methods (Random Forests, Gradient Boosting)
- Introduction to Neural Networks and Deep Learning
- Optimization Algorithms for Deep Learning (Gradient Descent, Adam, RMSprop)
- Hands-on Session: Implementing a Neural Network from Scratch

• Day 02

Advanced Deep Learning

- Convolutional Neural Networks (CNNs) for Image Recognition
- Transfer Learning and Fine-Tuning Pre-trained Models
- Recurrent Neural Networks (RNNs) and Long Short-Term Memory (LSTM)
- Generative Adversarial Networks (GANs) for Image Generation
- Variational Autoencoders (VAEs) for Data Generation and Compression
- Advanced Activation Functions (ReLU, Leaky ReLU, Swish, etc.)
- Hands-on Session: Building and Training a CNN for Image Classification

- **Day 03**

Natural Language Processing (NLP)

- Introduction to Natural Language Processing and Text Preprocessing
- Word Embeddings (Word2Vec, GloVe) for Text Representation
- Recurrent Neural Networks for Sequential Data in NLP
- Sequence-to-Sequence Models and Applications (Machine Translation, Text Summarization)
- Attention Mechanisms for Improved NLP Models (Transformer Architecture)
- Sentiment Analysis and Text Classification
- Hands-on Session: Building an NLP Model for Sentiment Analysis

- **Day 04**

Reinforcement Learning and Robotics

- Introduction to Reinforcement Learning (RL) and Markov Decision Processes (MDPs)
- Policy Gradient Methods (REINFORCE, Proximal Policy Optimization - PPO)
- Deep Q-Networks (DQNs) and Deep RL Techniques
- Actor-Critic Methods for Continuous Action Spaces
- Multi-Agent Reinforcement Learning
- Robotics and AI: Applications of RL in Robotics
- Hands-on Session: Implementing a Reinforcement Learning Agent for a Simple Game

- **Day 05**

Reinforcement Learning and Robotics

- Introduction to Reinforcement Learning (RL) and Markov Decision Processes (MDPs)
- Policy Gradient Methods (REINFORCE, Proximal Policy Optimization - PPO)
- Deep Q-Networks (DQNs) and Deep RL Techniques
- Actor-Critic Methods for Continuous Action Spaces
- Multi-Agent Reinforcement Learning
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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Dec. 14, 2025	Dec. 18, 2025	5 days	4250.00 \$	Qatar - El Doha