



Digital Transformation and Innovation

## Advanced Machine Learning Applications

## Course Introduction

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This **5-day training course** explores advanced machine learning (ML) techniques and their real-world applications across industries. Participants will gain hands-on experience with **cutting-edge ML models, deep learning architectures, and AI-driven decision-making**. The course covers key topics such as **natural language processing (NLP), computer vision, reinforcement learning, and model optimization**. By the end, participants will be equipped to **develop, deploy, and optimize ML solutions for complex business challenges**.

## Target Audience

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- **Data scientists and machine learning engineers** looking to enhance their expertise.
- **AI researchers and developers** working on advanced ML applications.
- **Business analysts and IT professionals** interested in AI-driven insights.
- **Software engineers and developers** integrating ML into applications.
- **Decision-makers and strategists** exploring AI for business innovation.

## Learning Objectives

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- Understand **advanced ML techniques** and their industry applications.
- Implement **deep learning models** for tasks such as image recognition and NLP.
- Optimize ML models for **performance, scalability, and accuracy**.
- Explore **reinforcement learning** and its role in automation and AI decision-making.
- Apply **AI-driven predictive analytics** for data-driven business strategies.
- Address **ethical considerations, bias, and model interpretability**.
- Gain practical experience through **hands-on coding, case studies, and real-world projects**.

# Course Outline

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- **Day 01**

## **Foundations of Advanced Machine Learning**

- Overview of **supervised, unsupervised, and reinforcement learning**
- **Deep learning architectures:** CNNs, RNNs, Transformers
- Tools and frameworks: **TensorFlow, PyTorch, Scikit-Learn**
- Data preprocessing and feature engineering

- **Day 02**

## **Natural Language Processing (NLP) & Text Analytics**

- **Word embeddings (Word2Vec, GloVe, BERT, GPT)**
- Text classification, sentiment analysis, and chatbots
- Advanced NLP applications: **speech recognition and translation**

- **Day 03**

## **Computer Vision & Image Processing**

- Convolutional Neural Networks (CNNs) and object detection
- Image segmentation and facial recognition applications
- Transfer learning and pre-trained model fine-tuning

- **Day 04**

## **Reinforcement Learning & Model Optimization**

- Fundamentals of **reinforcement learning and reward-based learning**
- Model tuning, **hyperparameter optimization, and performance evaluation**
- Explainability and fairness in ML models

- **Day 05**

## **Real-World Applications & Deployment**

- Deploying ML models using **cloud platforms and edge computing**
- Future trends in **AI, AutoML, and federated learning**

# Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 16, 2025	June 20, 2025	5 days	4950.00 \$	Ireland - Galway
Sept. 29, 2025	Oct. 3, 2025	5 days	4250.00 \$	UAE - Dubai
Dec. 14, 2025	Dec. 18, 2025	5 days	4250.00 \$	Qatar - El Doha