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Course Title
Artificial Intelligence – Machine Learning & Deep Learning Bootcamp
Course ID
AI-ML-501
Course Level
Intermediate to Advanced
Duration
180 Hours (Bootcamp)
Includes instructor-led training, labs, assignments, projects, quizzes, and interview preparation.
Delivery Mode
Hybrid / Onsite + Online LMS Support

Course Description
This bootcamp provides practical training in Artificial Intelligence, Machine Learning, and Deep Learning. Learners will build predictive models, work with real datasets, and develop intelligent systems using modern AI frameworks. The program focuses on hands-on implementation and industry-oriented project development.

Course Objectives
By the end of the course, learners will understand core AI and ML concepts, implement supervised and unsupervised learning models, design neural networks, and apply deep learning techniques for real-world problems. Participants will also gain experience in model evaluation, optimization, and deployment.

Intended Audience
This course is suitable for software engineering students, IT graduates, aspiring AI engineers, and professionals seeking careers in Machine Learning and Data Science.

Prerequisites
Basic programming knowledge (preferably Python) and familiarity with basic mathematics and statistics are recommended. A laptop with minimum i5 processor and 8GB RAM (16GB recommended) is required.

Tools & Platforms
Python, Jupyter/Colab, NumPy, Pandas, Scikit-learn, TensorFlow/PyTorch, OpenCV, and GitHub. LMS portal for resources and assessments.

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Course Outline (Modules & Topics)

Module 1: AI Foundations & Python for ML

Introduction to AI concepts, real-world applications, Python for data handling, data preprocessing, and visualization. Lab includes basic dataset analysis.

Module 2: Supervised Learning

Regression, classification, decision trees, model training, validation, and performance metrics. Lab includes building predictive models.

Module 3: Unsupervised Learning & Feature Engineering

Clustering, dimensionality reduction, and feature selection techniques. Lab includes segmentation and pattern analysis tasks.

Module 4: Neural Networks & Deep Learning Basics

Perceptron, activation functions, backpropagation, loss functions, and introduction to TensorFlow/PyTorch. Lab includes training a basic neural network.

Module 5: Deep Learning for Computer Vision

CNN fundamentals, image classification, transfer learning, and evaluation techniques. Lab includes image-based model development.

Module 6: Deep Learning for NLP

Text preprocessing, sequence models, sentiment analysis, and transformer overview. Lab includes text classification project.

Module 7: Model Optimization & Deployment

Hyperparameter tuning, cross-validation, model saving, and API-based deployment basics. Lab includes deploying an ML model.

Module 8: Capstone Project & Assessment

End-to-end AI project including data preprocessing, model training, evaluation, and presentation. Includes mock interviews and final evaluation.

Assessment & Evaluation

Assessment will include quizzes, assignments, lab tasks, and final capstone project evaluation to ensure practical competency and job readiness.