London TDM

Artificial Intelligence and Data Science Training Courses

Course Venue: United Arab Emirates - Dubai

Course Date: From 24 May 2026 To 28 May 2026

Course Place: Downtown Dubai

Course Fees: 5,000 USD

Introduction

Welcome to the "Feature Engineering and Model Optimization" course. This intensive 5-day program is designed for data professionals looking to enhance their skills in preparing data and optimizing machine learning models. You'll gain hands-on experience in creating effective features, utilizing advanced techniques for model tuning, and ultimately improving the performance of your predictive models.

Objectives

- Understand the principles of feature engineering and its impact on model performance.
- Learn techniques for selecting and extracting relevant features for various datasets.
- Gain proficiency in model optimization strategies to enhance predictive accuracy.
- Explore tools and libraries that facilitate feature engineering and optimization tasks.
- Apply best practices for deploying efficient and robust machine learning models.

Course Outlines

Day 1: Introduction to Feature Engineering

- Overview of feature engineering and its importance
- Types of features and data preprocessing techniques
- Handling missing data and categorical variables
- Understanding correlations and feature interactions
- Case study: Identifying potential features from raw data

Day 2: Advanced Feature Construction Techniques

- Feature extraction using dimensionality reduction
- Generating features through mathematical transformations
- Using domain knowledge for feature creation
- Feature selection methods: Filter, wrapper, and embedded techniques
- Hands-on exercise: Constructing features from complex datasets

Day 3: Optimizing Machine Learning Models

- Introduction to model optimization and hyperparameter tuning
- Grid search and random search techniques
- Implementing Bayesian optimization for model tuning
- Ensemble methods: Boosting, bagging, and stacking
- Lab session: Tuning models for maximum performance

Day 4: Tools and Libraries for Feature Engineering and Optimization

- Using Python libraries for feature engineering: pandas, numpy, and scikit-learn
- Automated feature engineering with FeatureTools and other tools
- Libraries for model optimization: Hyperopt, Optuna, and Tune
- Understanding and using ML pipelines for efficient processing
- Workshop: Building comprehensive pipelines with Python tools

Day 5: Best Practices and Case Studies

- Review of best practices in feature engineering and model optimization
- Exploring industry case studies of successful applications
- Ethical considerations and data integrity
- Group project: Developing and optimizing a model from scratch
- Course wrap-up and Q&A session