KOENIG SOLUTIONS · COURSE OUTLINE

Industry ML: Predictive Maintenance & Computer Vision

Learn to apply machine learning to predictive maintenance, computer vision and other operational challenges, from data preparation to deployment.

5 Days	10	37
40 HOURS	MODULES	TOPICS

COURSE OVERVIEW

This course covers machine learning fundamentals and their application to industry challenges such as predictive maintenance, safety and resource optimisation. It addresses data types and preprocessing, core techniques including supervised, unsupervised, time-series and reinforcement learning, and their use in operational areas like predictive maintenance, computer vision for safety, sentiment analysis and demand forecasting. It also covers advanced topics such as IoT and edge computing, computer vision, NLP and geospatial data, followed by hands-on labs, model deployment and monitoring, ethical AI practices, and current trends and case studies. The course concludes with a capstone project involving an end-to-end machine learning solution.

WHO THIS COURSE IS FOR

- **Data Scientists**
- **Machine Learning Engineers**
- **Operations Managers**
- **Maintenance Engineers**
- **Safety Officers**
- **AI Solution Architects**

LEARNING OBJECTIVES

- Explain how machine learning addresses industry challenges and use cases
- Identify data types and sources used in industrial machine learning
- Apply supervised, unsupervised and time-series learning techniques
- Implement predictive maintenance and computer vision for safety
- Analyse sentiment data and forecast demand and resource needs
- Integrate IoT, edge computing and geospatial data into ML models
- Deploy and monitor ML models across cloud, edge and hybrid environments
- Assess ethical considerations such as bias, privacy and sustainability

COURSE SYLLABUS

10 Modules, 37 Topics

01

Introduction to Machine Learning in Industry

Outcome: Understand the fundamentals of machine learning and how it addresses industry challenges.

TOPICS

- What is Machine Learning?
- Benefits of ML in Operational Efficiency, Safety, and Productivity
- Common Challenges and Limitations
- Key Industry Use Cases (Predictive Maintenance, Risk Management, Resource Optimization)

02

Foundations of Machine Learning and Data

Outcome: Learn to identify and prepare data for solving real-world problems.

UNDERSTANDING DATA TYPES AND SOURCES

Structured Data (Logs, Spreadsheets) · Unstructured Data (Images, Text) · IoT and Sensor Data

Data Preprocessing and Feature Engineering · Exploring the ML Pipeline

03

Core Machine Learning Techniques

Outcome: Gain the ability to select and apply appropriate ML methods to solve specific challenges.

TOPICS

- Supervised Learning for Predictive Insights (Classification and Regression)
- Unsupervised Learning for Anomaly Detection and Clustering
- Time-Series Analysis for Trend Prediction
- Reinforcement Learning for Optimization Problems

04

Applying ML to Operational Challenges

Outcome: Discover how ML is used to enhance day-to-day operations across industries.

TOPICS

- Predictive Maintenance for Equipment Reliability
- Safety Management Using Computer Vision
- Sentiment Analysis for Customer and Stakeholder Feedback
- Resource Allocation and Demand Forecasting

05

Advanced Concepts in Industry AI

Outcome: Explore cutting-edge ML applications and their relevance to business operations.

TOPICS

- Leveraging IoT and Edge Computing for Real-Time Analytics
- Computer Vision Applications (e.g., Hazard Detection, Monitoring)
- NLP for Automating Reports and Insights Generation
- Integrating Geospatial Data into ML Models

06

Hands-On Labs

Outcome: Apply learned concepts to practical scenarios using real-world datasets.

TOPICS

- **Lab 1:** Predict Equipment Failures with Maintenance Logs
- **Lab 2:** Identify Safety Hazards with Image Data
- **Lab 3:** Sentiment Analysis of Customer Feedback
- **Lab 4:** Optimize Operations with Time-Series Forecasting

07

Deployment and Operationalization of ML Models

Outcome: Learn how to take ML models from development to deployment in production environments.

TOPICS

- Model Deployment Options (Cloud, Edge, and Hybrid)
- Monitoring Model Performance and Ensuring Reliability
- Retraining and Updating Models for Continuous Improvement

08

Ethical and Responsible AI Practices

Outcome: Understand the ethical implications and responsibilities of deploying AI solutions.

TOPICS

- Bias Mitigation in ML Models
- Ensuring Privacy and Security Compliance
- Addressing Environmental Impact and Sustainability

09

Future Trends and Case Studies

Outcome: Stay ahead by exploring the latest AI advancements and real-world applications.

TOPICS

Autonomous Operations with AI · AI-Driven Sustainability Initiatives · Case Studies of Successful AI Deployments

10

Capstone Project

Outcome: Demonstrate end-to-end problem-solving skills in an industry-relevant ML challenge.

TOPICS

- Define the Business Problem and Collect Relevant Data
- Build, Deploy, and Present a Working ML Solution
- Discuss Lessons Learned and Business Impact

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

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