

Data Monitoring using AI

Course Description

This course provides a comprehensive understanding of how Artificial Intelligence can be leveraged for real-time data monitoring, anomaly detection, and governance. Participants will explore AI techniques, architectures, and tools to build intelligent monitoring solutions that ensure data quality, compliance, and operational efficiency.

Duration : 3 Days

Pre-requisites

- Basic knowledge of data engineering concepts
- Familiarity with SQL and Python
- Understanding of data pipelines and analytics tools

Learning Objectives

By the end of this course, participants will be able to:

- Explain the role of AI in modern data monitoring
- Implement anomaly detection using machine learning models
- Design real-time monitoring architectures with streaming tools
- Apply governance and compliance frameworks with AI support
- Build dashboards and automated alerting systems for enterprise data

Content Coverage

Day 1: Foundations of AI-Driven Data Monitoring

Module 1: Introduction to Data Monitoring

- Importance of monitoring in enterprise data systems
- Traditional vs AI-driven approaches
- Key challenges in large-scale monitoring

Module 2: AI Fundamentals for Monitoring

- Machine learning concepts for anomaly detection
- Role of NLP in log and event monitoring
- Supervised vs unsupervised approaches

Module 3: Data Quality & Anomaly Detection

- Defining data quality metrics
- AI-based anomaly detection techniques
- Case studies: fraud detection, sensor data monitoring

Day 2: Architectures, Tools & Platforms

Module 4: Real-time Monitoring Architectures

- Streaming data pipelines (Kafka, Spark)
- Integration with Databricks and Microsoft Fabric
- Automated alerting and response mechanisms

Module 5: Tools & Platforms for AI Monitoring

- Microsoft Fabric & Power BI integration
- Informatica IDQ with AI extensions
- Open-source tools: Prometheus, ELK, Metabase

Module 6: Hands-on Labs

- Building an AI-powered monitoring dashboard
- Implementing anomaly detection in Python/SQL
- Real-time alerts with Kafka & Power Automate

Day 3: Governance, Compliance & Enterprise Use Cases

Module 7: Governance & Compliance in AI Monitoring

- AI in regulatory monitoring (GDPR, HIPAA)
- Data privacy and ethical AI considerations
- Audit trails and explainability

Module 8: Case Studies & Capstone Project

- Enterprise scenarios: banking, healthcare, IoT
- Capstone project: design an AI-driven monitoring solution
- Presentation & peer review