# Developing Event-Driven Applications with Apache Kafka and Red Hat AMQ Streams

**Course Duration: 32 Hours** **Course code: DDK215**

## 1. Course Overview

The AD482 – Developing Event-Driven Applications with Apache Kafka and Red Hat AMQ Streams course equips developers to build scalable, real-time applications using modern messaging and streaming technologies. Participants learn to design, implement, and deploy event-driven microservices with Apache Kafka and Red Hat AMQ Streams on Red Hat OpenShift. The training covers key concepts like topic design, message ordering, consumer groups, and streaming patterns. By the end, learners can create fault-tolerant, high-performance applications for hybrid and cloud-native environments.

## 2. What you'll learn?

**By the end of this course, learners will:**

This course aims to provide participants with the skills to design, develop, and deploy event-driven applications using Apache Kafka and Red Hat AMQ Streams. Learners will explore core concepts of distributed event streaming, message brokering, and real-time data processing. They will also gain practical experience in implementing producers and consumers, managing Kafka clusters, and integrating event-driven workflows into enterprise-grade

solutions, enabling them to build robust, scalable, and high-performance streaming applications.

## 3. Target Audience

- Java developers and application developers
- Software architects designing event-driven systems
- Integration developers and middleware engineers
- DevOps engineers working with streaming platforms
- Professionals responsible for building real-time data pipelines
- Technical leads adopting microservices architecture

## 4. Pre-Requisites

**Participants should have:**

- Before starting this course, participants should have a solid understanding of core Java programming and basic knowledge of enterprise application development. Familiarity with containerization concepts and fundamental Linux administration skills will further support hands-on exercises involving Red Hat AMQ Streams.
- Proficiency in Java programming
- Basic understanding of enterprise application development
- Familiarity with Linux command line
- Awareness of container technologies (such as Docker or Padman is helpful but not mandatory

## 5. Course content

## Module 01 – Introduction to Event-Driven Architecture

- Overview of Event-Driven Applications and Use Cases
- Introduction to Apache Kafka and Red Hat AMQ Streams
- Understanding Core Kafka Concepts: Topics, Partitions, and Brokers

## Module 02 – Setting Up the Development Environment

- Installing and Configuring Apache Kafka and AMQ Streams
- Integrating Kafka with Red Hat OpenShift
- Using Kafka Command-Line Tools for Basic Operations

## Module 03 – Producing and Consuming Events

- Creating Kafka Producers and Consumers in Java
- Managing Message Serialization and Deserialization
- Implementing Consumer Groups and Offsets

## Module 04 – Designing Event Streams

- Best Practices for Topic Design and Partitioning
- Message Ordering and Delivery Guarantees
- Event Schemas and Schema Registry Usage

## Module 05 – Stream Processing and Patterns

- Introduction to Kafka Streams API
- Implementing Streaming Patterns (Filter, Aggregate, Join)
- Handling Late or Out-of-Order Events

## Module 06 – Reliability, Scalability, and Fault Tolerance

- Configuring Replication and Acknowledgements
- Error Handling and Retry Strategies
- Ensuring High Availability in Kafka Deployments

## Module 07 – Monitoring, Security, and Deployment

- Securing Kafka Clusters with Authentication and Authorization
- Monitoring Kafka with Metrics and Logging
- Deploying Event-Driven Applications in Hybrid and Cloud Environments



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