Kotlin

Total Duration
3 days

Audience
This workshop is intended for developers who need to start developing applications using TDD or BDD approach with Kotlin.

Course Objectives
At the end of the course, participants will have knowledge of

- Kotlin Coding
- Functional Programming
- TDD / BDD

Pre-requisites
- Java (Any other Object-Oriented Language)

Course Contents
Day 1:

- Introduction and Basics
  - Why Kotlin
  - The Structure of a Kotlin Application
  - Conventions Used with Kotlin

- Functional Programming
  - Arity
  - Higher-Order Functions (HOF)
  - Closure
  - Partial Application
  - Currying
  - Auto Currying
  - Function Composition
  - Morphism
  - Endomorphism
  - Isomorphism

- The Basics of Kotlin
  - Declaring Variables in Kotlin
  - Working with Basic Types in Kotlin
  - Loops and Ranges in Kotlin
  - Conditional execution with if and when in Kotlin

- Packages and Imports in Kotlin & Summary of Kotlin Basics

- TDD/BDD Approach
  - Understanding both approaches
  - Working with Junit

- Functions
  - Introduction to functional programming
    - Monads
    - Monad Laws
  - Functions in Kotlin
  - Functions with Default and Named Parameters in Kotlin
  - Functions with Unlimited Parameters in Kotlin

- Classes in Kotlin
  - Member Functions in Kotlin
  - Visibility Modifiers in Kotlin
  - Kotlin Data Classes
  - Enum Classes in Kotlin
  - Objects in Kotlin & Summary

- Inheritance
  - Inheritance in Kotlin
  - Working with Abstract Classes in Kotlin
  - Interfaces in Kotlin
  - A Brief Look at Generics in Kotlin

- Working with Nulls
  - Null Safety

- A handful of tidbits
  - Type Casting in Kotlin
  - Tuples
  - Deconstructing values
  - Working with Exceptions
  - Declaring Constants
  - Annotations in Kotlin

- Getting Functional
  - Higher-Order Functions in Kotlin
  - Lambda Expressions in Kotlin
  - Closures in Kotlin
  - Extension Functions in Kotlin

- Interoperability
  - Interoperability with Java
  - Talking to Java from Kotlin
  - Working with nulls from Java
  - Talking Kotlin in Java
  - Top-level Functions and Properties in Kotlin
  - Extension Functions from Java

- Standard Library
  - Kotlin Standard Library and Working with Collections in Kotlin
  - Filtering, Mapping, and Flat mapping in Kotlin
  - Lazy Evaluation with Sequences in Kotlin
  - String Extensions in Kotlin & Summary

Day 2

- Exception Handling
  - Basic Working

- Delegation
  - Delegation pattern Vs inheritance
  - Property Delegation
  - Overriding a member of an interface implemented by delegation

- Classes and Objects
  - Extension functions
  - Generics
  - Extensions are resolved statically
  - Nullable Receiver
  - Extension Properties
  - Scope of Extensions

- Database Communication
  - CRUD Operations for Postgres
  - CRUD Operations for MongoDb

Day 3

- Web Application
  - Developing web applications using HTTP Servlet
  - Server as a Function
  - Working with HTTP4K
  - Immutable HTTP message objects
  - Commonly used HTTP functionalities provided as reusable Filters

- Path-based routing, including nestable contexts
- Static file-serving capability with Caching and Hot-Reload
- Servlet implementation to allow plugin to any Servlet container

- Introduction to Async Programming
  - Scenarios
  - Implementation Styles

- Pointers
  - Performance Monitoring Tools
  - Design Patterns
  - Different Tools