

Kotlin



e-Learning Course

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ZETLAN TECHNOLOGIES

COURSE MODULES

Module 1: Introduction to Kotlin

- What is Kotlin? & Kotlin vs Java
- Setting up the Development Environment (IntelliJ, Android Studio)
- Writing Your First Kotlin Program
- Kotlin REPL (Read-Eval-Print Loop)
- Kotlin Basics: Syntax & Structure

Module 2: Kotlin Fundamentals

- Variables & Data Types
 - val vs var
 - Primitive and Non-Primitive Data Types
- Operators
 - Arithmetic, Logical, Bitwise, Comparison Operators
- Control Flow
 - Conditional Statements (if-else, when)
 - Loops (for, while, do-while)

Module 3: Functions & Scope

- Declaring and Calling Functions
- Function Parameters & Return Types
- Default & Named Arguments
- Lambda Expressions & Higher-Order Functions
- Inline Functions & Scope Functions (let, run, apply, also, with)

Module 4: Object-Oriented Programming (OOP) in Kotlin

- **Classes & Objects**
 - Class Declaration & Object Creation
 - Constructors (Primary & Secondary)
- **Inheritance & Polymorphism**
 - open Modifier
 - Method Overriding
- **Encapsulation**
 - Visibility Modifiers (private, protected, internal, public)
- **Abstract Classes & Interfaces**
- **Data Classes & Sealed Classes**
- **Object & Companion Objects**

Module 5: Collections & Data Handling

- **Lists, Sets, and Maps**
- **Mutable vs Immutable Collections**
- **Collection Operations (filter, map, reduce, fold)**
- **Null Safety (?., !!, ?::, lateinit, lazy)**

Module 6: Exception Handling & Coroutines

- **Try-Catch-Finally**
- **Custom Exceptions**
- **Introduction to Coroutines**
- **Launch, Async, Await, Delay**
- **Coroutine Scopes (GlobalScope, runBlocking, CoroutineScope)**

Module 7: Kotlin for Android Development

- Introduction to Android Development with Kotlin
- Activity & Fragment Lifecycle
- RecyclerView & View Binding
- Networking with Retrofit
- Room Database for Local Storage
- MVVM Architecture with Kotlin

Module 8: Advanced Kotlin Topics

- Extension Functions
- Operator Overloading
- Generics
- Reflection in Kotlin
- DSL (Domain-Specific Language)
- Kotlin Multiplatform (KMP)

Module 9: Testing & Deployment

- Unit Testing with JUnit & MockK
- UI Testing in Android with Espresso
- Performance Optimization
- Packaging & Deployment