Swift

e-Learning Course

ZETLAN TECHNOLOGIES

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COURSE MODULES

Module 1: Introduction to Swift

- Overview of Swift and its history
- Setting up the development environment
- Writing your first Swift program
- Basic syntax and structure

Module 2: Swift Fundamentals

- Variables and constants
- Data types (Int, Double, String, Bool, etc.)
- Operators (arithmetic, comparison, logical)
- Control flow (if, else, switch, loops)

Module 3: Functions and Closures

- Defining functions
- Function parameters and return values
- Function overloading
- Closures and their usage
- Trailing closures and capturing values

Module 4: Object-Oriented Programming in Swift

- Structures (struct) vs Classes (class)
- Properties and methods
- Initializers (init)
- Inheritance and polymorphism
- Protocols and extensions

Module 5: Optionals and Error Handling

- Understanding optionals (?, !)
- Unwrapping optionals (if let, guard let, nil-coalescing)
- Error handling (do-catch, throws, rethrows)

Module 6: Collections and Advanced Data Types

- Arrays, Sets, and Dictionaries
- Iterating through collections
- Higher-order functions (map, filter, reduce)
- Tuples and enumerations (enum)

Module 7: Concurrency and Multithreading

- Grand Central Dispatch (GCD)
- Async/Await
- Background tasks and UI updates
- Actors and structured concurrency

Module 8: Working with JSON and APIs

- Encoding and decoding JSON using Codable
- Networking with URLSession
- Handling API responses
- Error handling in networking

Module 9: SwiftUI and UI Development

- Basics of SwiftUI (views, modifiers, stacks)
- State management (@State, @Binding, @Environment)
- Navigation and transitions
- Animations and gestures

Module 10: Advanced Swift Topics

- Memory management (ARC, weak, unowned)
- Property wrappers
- Generics and type constraints
- Functional programming concepts

Module 11: Testing and Debugging

- Unit testing with XCTest
- Debugging techniques in Xcode
- Performance optimization

Module 12: Building a Real-World Swift Project

- Planning an app
- Implementing core features
- Code organization and best practices
- Deploying to the App Store