**Overview**

### This course will covered the fundamentals of building apps for iOS in Swift, as well as covering additional topics that address the needs of Elm Company.

* Fundamentals of the Swift programming language
* Building great user interfaces with UIKit
* Targeting different phones and tablets
* Showing data in table views, and linking screens
* Core Cocoa Touch frameworks such as Mapping and Multi-touch
* Saving and restoring data with JSON, XML and CoreData
* Delighting the user with animation
* Network services and displaying web data
* Notifications
* Making great apps and deploying to app store

**Proposed Syllabus**

*Instructions for Xcode installation and setup will be distributed before the course.*

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| Day 1 **Session 1: Introduction to Swift**   * Trainer and Delegate Introductions / Intro to course * Foundations of Swift * XCode Playgrounds * Basics of the language: Types, Operators, Conditionals, Iterators, Strings, Arrays, Dictionaries * *Lab 1: Trying out the language basics*   **Session 2: Introduction to using Xcode**   * Making first app / toolkit features * MVC and linking code to Storyboards * Using the documentation * Introduction to UIKit * *Lab 2: Building and running single screen apps on simulator and device*   **Session 3: UIKit: Views and controls**   * Attributes of common views * Adding controls to your app * Adding more views * *Lab 3: Building apps with more views and controls*   **Session 4: Functions**   * Function parameters and results * Argument labels * Default values * *Lab 4: Writing functions*   **Session 5: Prototyping an interface design**   * Deciding what goes into the app * Making the screens for a multi-screen app and joining them * Trying out the app on potential users * Taking Apple design considerations and HCI guidelines into account * *Lab 5: Building an app prototype without code* |

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| Day 2 **Session 6: Structs**   * Creating structs and initialising them * Properties and access * Methods and using them * *Lab 6: Creating and using Structs*   **Session 7: Classes**   * Inheritance in Swift * Initializers * Methods and properties * Overriding methods and properties * Difference between classes and structs * When to use classes and structs * *Lab 7: Writing classes*   **Session 8: Working with different screen sizes**   * Autolayout * Stack layout * *Lab 8: Fitting many items on different size screens* * *Further exercises on Autolayout*   **Session 9: Dictionaries/Optionals / Guard / Scope**   * Dictionaries/why we need optionals * How to use them correctly * Making code tidy with Guard * Understanding scope of variables * *Lab 9: Optionals and Guard*   **Session 10: Advanced navigation in UIKit**   * Segues * Navigation * Tab bars * Lifetime of an app * *Lab 10: Making complex apps* |

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| Day 3 **Session 11: Building dynamic tables**   * Basic tables * Linking to child screens * Passing child data * Customising table cells * Linking to multiple child screens * *Lab 11: Building tables*   **Session 12: Protocols, closures**   * Built in protocols – CustomStringConvertible, Equatable, Comparable, Codable * Defining and implementing your own protocols * Using closures * Shortening closures * *Lab 12: Protocols and Closures*   **Session 13: Location facilities**   * Setting up location services * Tracking movement * Annotating maps * *Lab 13: Adding Maps to an app*   **Session 14: Interacting with taps and the accelerometer**   * Implementing taps and swipes * Using the accelerometer * *Lab 14: Example apps using taps, swipes and the accelerometer* |

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| Day 4 **Session 15: Data storage with Codable**   * Application sandbox * Where to save data in iOS * Storage choices * Coding choices - JSON, PLIST, XML * Codable for local state * Preferences * CoreData for complex data * *Lab 15: Extended lab bringing together work on tables, data access and storing data locally.*   **Session 16: Unit Testing**   * Identifying what to unit test * Setting up tests * Running tests in XCTest * *Lab 16: Writing Unit Tests for iOS Apps*   **Session 17: Data storage with Core Data**   * Ideas behind Core Data * Persisting networks of objects using Core Data * *Lab 17: Replacing Codable with Core Data*   **Session 18: Animations**   * How animations are used in iOS * Delighting users with animations * Types of animation that are possible * *Lab 18: Building animations* |

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| Day 5 **Session 19: Web browsing, web services**   * Integrating web browsing into your app * Calling web services and receiving data asynchronously * Concurrency and Grand Central Dispatch * Processing data and updating screens * *Lab 19: Reading and processing data from a web service*   **Session 20: Cloud services and cocoa pods**   * Setting up Google Firebase * Swift Package Manager or Cocoapods? * Using Firebase for cloud storage * Authorization and security * Local and remote data * *Lab 20: Building a Firebase app*   **Session 21: Notifications**   * What are notifications? * Working with notifications * Creating and Issuing local notification * Issuing and catching a push notification * *Lab 21: Adding notifications to your app* |

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| Day 6 **Session 22: Reactive Apps**   * Overview of SwiftUI * MVVM * Basics of building screens in SwiftUI * Specific example of making Forms in SwiftUI * *Lab 22: Example of SwiftUI*   **Session 23: Final Case Study**   * Students will have a choice of building a new complete app from scratch in UIKIT or in SwiftUI, or being supported in building an app of their own choice. * *Lab 23: Building chosen app* |