



Second Year of Engineering (Semester IV)

Advanced Swift Programming and UI Concepts

Teaching Scheme	Credit	Examination Scheme
Theory : 2 Hrs/week Laboratory: 4 Hrs/week	Theory: 02 Practical:04	Mid_Sem: 30 End_Sem: 70

Course Objectives:

1. To learn and understand the optionals, Type casting in Swift Language
2. Understanding the app anatomy and life cycle in Swift.
3. To learn concept of view controller life cycle and building simple workflows.
4. To provide knowledge of segues and navigation controllers for Mobile app development using Xcode.

Course Outcomes:

Upon completion of the course, students will be able to:

- CO1. Identify and understand the optionals, Type casting used in Swift programming Language.
- CO2. Proficient in building simple workflows.
- CO3. Apply the Knowledge optionals, Type casting for iOS App development.
- CO4. Understand the advanced concepts of Swift and be able to apply it in iOS app development.

Course Contents		
Unit I	Optionals	08 Hours

Optionals: Intro to Optionals, Specifying the Type of an Optional, Working with Optional Values, Functions and Optionals, Failable Initializers, Optional Chaining, Implicitly Unwrapped Optionals,

Unit II	Type Casting and Inspection, Guard, Enums	07 Hours
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Type Casting, Any, Guard with optionals, Constant and variable scope, variable shadowing, Shadowing and Initializers, Enumerations

Unit III	App Anatomy and Life Cycle	08 Hours
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App life Cycle, break down the delegate, Protocols methods: Did Finish Launching, Will Resign Active, Did Enter Background, Will Enter Foreground, Did Become Active, Will Terminate.

View Controller life Cycle: viewDidLoad, viewWillAppear, viewDidAppear, viewWillDisappear

Unit IV	Building Simple Workflows	07 Hours
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Design Principles, Aesthetic Integrity, Consistency, Direct Manipulation, Feedback, Metaphors, User Control, Human Interface Guidelines, Navigation Hierarchy, Hierarchical Navigation, Flat Navigation, Content-Driven, or Experience-Driven, Navigation, Navigation Design Guidelines, Example Workflow

Unit V	Segues, Navigation Controllers and Tab Bar Controllers	07 Hours
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Segues, Unwind Segue, Navigation Controllers, Navigation Bar, Navigation Item, Pass Information, Create Programmatic Segues,
Tab Bar Controllers: Add a Tab Bar Controller, Add Tabs, Tab Bar Items, Customize Tab Bar Items, Configuring The tabBar, Programmatic Customization, Link the Tabs to Code

Unit IV	User Interactivity and Advanced UI Concepts	07 Hours
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Common system views configuration: Gestures, Extensions, Delegation, Protocols, Closures, and Handling Touches.

Basic iOS Animations: Timer, view based animations, UI dynamics, Alerts, Actions Sheets, Notifications, Segues.

Learning Resources

Text Books:

1. Matthew Mathias, John Gallagher, Swift Programming: The Big Nerd Ranch Guide 2nd edition, 2015.
2. Matt Neuberg , iOS 12 Programming Fundamentals with Swift, O'Reilly; 5th edition.
3. App Development with Swift (as available on iBook Store)

Reference Books:

1. Paris Buttfield-Addison, Jonathon Manning , Tim Nugent Learning Swift: Building Apps for macOS, iOS, and Beyond, O'Reilly Media, Inc., 3rd ed, 2018.
2. Jon Hoffman, Mastering Swift 4, Packt Publishing Limited ,4 thedition,2017.
3. Vandad Nahavandipoor. iOS 11 Swift Programming Cookbook, O'Reilly Media, 2017
4. S. Yamacli, Beginner's Guide to iOS 11 App Development Using Swift 4: Xcode, Swift and App Design Fundamentals,(1e), USA: CreateSpace Independent Publishing Platform, 2017.

Swift Laboratory

Suggested List of Laboratory Experiments/Assignments

(Use suitable programming language/Tool for implementation)

Group A:

1. Lab: Optionals.playground
2. Lab: Type casting.playground
3. Lab: Guard.playground
4. Lab: Enumerations.playground

Group B:

1. Create an App to demonstrate Lifecycle of an App.
2. Create an App to demonstrate ViewController Lifecycle.
3. Create an App to demonstrate User Interactivity and Advanced UI Concepts.
4. Create different apps using Timer, Alerts, Actions Sheets and Notifications.

Group C:

Guided Project: **Personality Quiz**