

SEMESTER III

Sl. No.	Course Code	Name of the Course	Hours			Marks		Credits
			L	T	P	Internal	End Semester	
1	KAD 2301	Entrepreneurship and New Venture Planning (G-T)	4			50	50	4
2	KAD 2302	Software Product Design & Agile Process Management. (G-T)	4			50	50	4
3	KAD2303	Programming with Swift (D-P)	4	1		50	50	4
4	KAD 2304	iOS App Development – I (D-P)	4	1		50	50	4
5	KAD 2305	iOS App Development – II (D-P)	4	1		50	50	4
6	KAD 2306	Elective – III(G-T/D-T)*	3	2		50	50	3
7	KAD 2307	Elective – IV(D-T)	3	2		50	50	3
8	KAD 2308	Software Lab III (iOS & Swift) (LAB)			6	50	50	3
		Total				800		29

KAD 2301 ENTREPRENEURSHIP AND NEW VENTURE PLANNING

COURSE DESCRIPTION

The course provides an understanding of the nature of entrepreneurship while providing inputs about policy support and the legal aspects. Different facets of business plan preparation after idea generation and environmental analysis are discussed. Feasibility analysis methods and business model planning which play key roles in the success of new ventures are explained. Financing and valuation of new ventures have evolved into sophisticated areas of entrepreneurship management and are discussed in both global and Indian contexts.

COURSE LEARNING OUTCOMES

Learning Outcomes		Cognitive Level
CLO1	Explain the practical steps involved in starting new ventures.	Understand
CLO2	Discuss the financing, taxation regulations and legal requirements applicable to such ventures.	Understand
CLO3	Apply different methods of valuation, feasibility analysis, business planning and business model development.	Apply
CLO4	Evaluate the modes of financing for securing adequate investment including tapping government	Evaluate
CLO5	Create business models for mature ideas under start-up mode considering the legal and regulatory requirements	Create

Mapping of course outcomes with programme outcomes - Low=1, medium=2, High=3

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1						2		2
CLO2								3
CLO3						1		3
CLO4						1		3
CLO5						1	2	3

Module I

Entrepreneurship, Entrepreneurs, Characteristics of Entrepreneurship, Personality traits and personal values of entrepreneurs, Creativity and entrepreneurship, Idea generation and environmental analysis, Entrepreneurship Ecosystem.

Module II

Entrepreneurship and Strategy, Business Models and Strategy, Innovation, Value proposition and market analysis, the Business Plan, Elements of the Business Plan, The Marketing and Sales Forecasting.

Module III

Feasibility analysis: market feasibility, financial Feasibility and technical feasibility, Business model planning, New Value creation.

Module IV

Valuation, New Venture Finance, Determining Financial Needs, Sources of Financing, debt financing, equity financing, crowd funding, Securing Investors and Structuring the Deal, Approaching Investors, Structuring the Deal, Negotiation Skills, Networking and entrepreneurship, Business Incubation, Legal and Tax Issues, Governmental support to start-ups.

Module V

Organising for start-ups, Legal incorporation- possibilities, Networking and Alliances, Organizing manufacturing and distribution – various operation models, Traditional Organizational Structure, Entrepreneurial Performance: The Balanced Scorecard.

REFERENCES

1. *David Butler, Business Planning: A Guide to Business Start-Up, Butterworth Heinemann, 2000, ISBN-13:978-0750647069*
2. *Vasant Desai, Dynamics of Entrepreneurship Development and Management, Himalaya Publications, 2007, ISBN-13:9788184884975*
3. *Saha, A. and Sharma, V, Entrepreneurship and New Venture Creation, Excel Books, 2008, ISBN-13:978-8174466075*
4. *Peter Ferdinand Drucker, Innovation and Entrepreneurship, London, 1985.*
5. *AnjanRaichaudhuri, Managing New Ventures: Concepts and Cases in Entrepreneurship, PHI, 2010, ISBN-13:978-8120341562*
6. *Clare Griffiths, and Brad Crescenzo, My Start-Up Plan: The business plan toolkit, Kindle edition, 2012.*
7. *Donald F. Kuratko, and Jeffrey Scott Hornsby, New Venture Management: The Entrepreneur's Roadmap, Pearson Education, 2008, ISBN-13:978-013613032*

KAD 2302 SOFTWARE PRODUCT DESIGN & AGILE PROCESS MANAGEMENT

COURSE DESCRIPTION

This course evaluates various work-flow management principles, architectures, and tools. Kanban framework and tools are used for the project and work-flow management. In addition to Kanban, Agile and Scrum architectures are applied for project management scenarios. Open-Source and paid tools are used to provide management solutions for different project scenarios.

COURSE LEARNING OUTCOMES

Learning Outcomes		Cognitive Level
CLO1	Understand various software product lifecycle, its implementation and different tools used for project management	Understand
CLO2	Understand the Agile software development framework	Understand
CLO3	Understand the principles and practices required for release, iteration planning, Customer tests, small and regular releases	Understand
CLO4	Apply Scrum-based project management	Apply
CLO5	Analyze the Kanban project management framework	Analyze

Mapping of course outcomes with programme outcomes - Low=1, medium=2, High=3

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1	1	1	2	2		1		1
CLO2	1	1	2	2		2		1
CLO3	2	3	2	2		2		1
CLO4	2	3	2	2		2		1
CLO5	2	3	2	2		2		2

Module I

Introduction to software product lifecycle, Traditional approaches, Overview of agile software development, Agile Manifesto, Agile Development frameworks, Lean Software Development.

Module II

Principles and Practices, Kanban board and flow, Planning and Estimation, Process Improvement, Kanban metrics, Example for Kanban project management.

Module III

Introduction, Principles and Practices, Requirements and User Stories, Release Planning, Iteration Planning, Customer Tests, Small, Regular Releases. Pair Programming, Continuous Integration, Collective Code Ownership, Team Roles

Module IV

What is Scrum? Scrum benefits, Scrum framework, Sprints, Requirements and user stories, Product backlog, Estimation and Velocity, Scrum Team structures, Scrum Events, Artifacts, Planning principles.

Module V

Common Tools: Atlassian Jira, Active Collab, Wrike, Agilo for Scrum, Pivotal Tracker, Easy Redmine

Open Source Tools – MyCollab, Odoo, OpenProject, OrangeScrum, Taiga, Tuleap

Practical implementation of agile methodologies in Android/iOS App Development Environment.

REFERENCES

1. *Kenneth S. Rubin* , Essential Scrum: A Practical Guide to the Most Popular Agile Process, *Addison-Wesley Professional*, 2012, ISBN-13: 978-0137043293
2. *Marcus Hammarberg* , *Joakim Sunden* , Kanban in Action, *Manning Publications*, 2014, ISBN-13:978-1617291050
3. *Robert K. Wysocki* , Effective Project Management: Traditional, Agile, Extreme, *Wiley*, 2013, ISBN-13:978-1118729168
4. *Kenneth S. Rubin*, Essential Scrum: A Practical Guide to the Most Popular Agile Process, *Addison-Wesley*, 2012, ISBN-13:978-0137043293
5. *Henry Hayes*, Agile Project Management: The Ultimate Guide to Agile Project Management and Software Development-Plus Tips & Tricks for Implementing Scrum! (Agile Project Management, Agile Development, Scrum), *CreateSpace Independent Publishing Platform*, 2016, ISBN-13: 978-1540315380
6. *John A Estrella* , *Rossetta Sornabala* , Agile Project Management for Mobile Application Development, *Agilitek Corporation*, 2017 , ISBN-13:978-0978435462

KAD 2303 PROGRAMMING WITH SWIFT

COURSE DESCRIPTION

This course assesses the Swift framework and its implementations. The concept of data-structures, operators, flow-control, arrays, properties, instances, inheritance, protocols, generics, and extensions are applied to problems. The students get an in-depth understanding of Swift programming and this course acts in conjunction with the iOS app development I and II courses, to enlighten students into the world of professional iOS development

COURSE LEARNING OUTCOMES

Learning Outcomes		Cognitive Level
CLO1	Understand the operators, data structures, inheritance, and error handling in Swift	Understand
CLO2	Analyze access control and enumeration.	Analyze
CLO3	Create extensions and their implementations	Create
CLO4	Create programs based using class, methods, protocols, generics, flow control, operators, and functions	Create
CLO5	Create memory management and develop solutions based on it	Create

Mapping of course outcomes with programme outcomes - Low=1, medium=2, High=3

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1	2		1	1				1
CLO2	2		2	2				1
CLO3	3	2	3	3				1
CLO4	3		3	3	2			
CLO5	3	1	2	2	2			1

Module I

Introduction: History of Swift, Features, Benefits, Objective-C and Swift, Introduction to XCode and the iOS Simulator. Data Types: Basic Data Types, Tuples, Optional Types, Enumerations. Basic Operators: Assignment Operators, Arithmetic Operators, Comparison Operators, Range Operators, Logical Operators, Strings and Characters: Strings, Common String Functions, and Interoperability with NSString, Collections: Arrays, Dictionaries, Copying the behavior of Arrays and Dictionaries.

Module II

Flow Control: Selection, Conditions, Boolean logic and IF Statements, Optionals, IF Let Statements, Testing for nil and Optional Bindings, Switch Statements, Range Operators; Looping: For-Loops, Nested Loops, For-in Loops, Half-Open Range Operators, While Loops and Repeat- While Loops, Functions: Defining and Calling a Function, Function Types, Nested Functions, Closures: Understanding Closures, Closure Functions of Arrays, Using Closures in our Functions.

Module III

Structures and Classes: Structures, Classes. Properties: Stored Properties, Computed Properties, type Properties, Property Observers, Methods: Instance Methods, Type methods, Subscripts. Inheritance: Understanding Inheritance, Types of Initializers, Deinitialization, Optional Chaining, Error Handling.

Module IV

Protocols and Delegates: Understanding Protocols, Protocols as Types, Protocol Inheritance, Class-Only Protocols, Protocol Composition, Understanding Delegates.

Generics: Understanding Generics, Implement Generic Functions, Implement Generic Functions using Multiple Parameters, Generic Types, Associated Types, Generic Subscripts.

Module V

Extension: Extension Syntax, Working with computed properties, methods, initializers and subscripts, Adding Protocol Conformance with an Extension, Protocol Extensions, Extensions with Generic Types, Access Control: Access levels, Access Control Syntax, Access control to classes, structures and enumerations, Assigning access levels to protocols and extensions.

Memory management: Automatic Reference Counting (ARC), Strong Reference Cycles between Class Instances, weak references, unowned references, Memory Safety, Understanding Conflicting Access to Memory.

REFERENCES

1. *Jon Hoffman*, Mastering Swift 4 - Fourth Edition: An in-depth and comprehensive guide to modern programming techniques with Swift, *Packt publishing*, 2017, ISBN-13: 978-1788477802
2. *Donny Wals*, Mastering iOS 11 Programming - Second Edition: Build professional-grade iOS applications with Swift 4 and Xcode, *Packt publishing*, 2017, ISBN-13: 978-1788398237
3. *Keith Moon*, Swift 4 Programming Cookbook, Packt Publishing, 1 edition (September 28, 2017), ISBN-13:978-1786460899
4. *Matt Neuburg*, iOS 11 Programming Fundamentals with Swift: Swift, Xcode, and Cocoa Basics *1st Edition*, O'Reilly Media; 1 edition (October 19, 2017), ISBN-13: 978-1491999318.
5. *Chris Eidhof, Ole Begemann, Airspeed Velocity*, Advanced Swift: Updated for Swift 4, CreateSpace Independent Publishing Platform, 2016, ISBN-13:978-1539154716
6. *Matthew Mathias, John Gallagher*, Swift Programming: The Big Nerd Ranch Guide (2nd Edition), Big Nerd Ranch Guides; 2 edition (December 8, 2016), ISBN-13: 978-0134610610
7. *Web Reference:*<https://developer.apple.com/swift/>

KAD 2304 IOS APP DEVELOPMENT – I

COURSE DESCRIPTION

The course explains the fundamentals of iOS development. The core concepts in this course are data-structures, cocoa, foundation frameworks, story-boards, MVC, developer-guidelines, user controls, views, controllers, pop-overs and toolbars. By evaluation of the fundamentals of iOS development, the students can design basic solutions in the production environment.

COURSE LEARNING OUTCOMES

Learning Outcomes		Cognitive Level
CLO1	Understand the fundamentals of iOS	Understand
CLO2	Apply the Cocoa framework for iOS development	Apply
CLO3	Apply User Controls in projects	Apply
CLO4	Create Story Board, MVC, Protocols and Delegates, View System, Controllers, and devise solution based on it	Create
CLO5	Design and create projects based on multi-scene storyboards, toolbars, and pickers	Create

Mapping of course outcomes with programme outcomes - Low=1, medium=2, High=3

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1	1							
CLO2	2	1	1	1	1			
CLO3	2	1	1	1	2			
CLO4	3	2	2	3	3			2
CLO5	3	3	3	3	3			3

Module I

Introduction to iOS Platform, iOS Devices and the Apple Developer Tools, UI Guidelines to IOS, Introduction to XCode and the iOS Simulator, Exploring the iOS Technology Layers, iOS Application Life Cycle, Cocoa Fundamentals-Application Classes, Data Type Classes and Interface Classes, Foundation Framework, iOS Coding Standards.

Module II

Introduction to Interface Builder and Storyboard, Creating User Interfaces, Autolayout, Customizing the Interface Appearance, Connecting to Code, Outlets and Actions, Introduction to MVC Design Pattern, Implementing MVC with Xcode, Single View Application Template, Building Applications, Developer Guidelines.

Module III

Protocols and Delegates, Working with labels, Basic User Input and Output Using Text Fields, Text Views, Buttons, Image Views, Animation, Sliders, Steppers, Search Box, Switches and Segmented Controls.

Module IV

Web Views, Scrolling Views, Alert Controllers, System Sound Services, Vibrations, Tables and Split View Controllers and Collection View.

Module V

Multi-scene Storyboard, Passing Data between Scenes, Segues, PopOvers, Understanding the Role of Toolbars, ExploringPickers.

REFERENCES

1. *Matt Neuberg*, iOS 11 Programming Fundamentals with Swift, *O'Reilly*, 2017, ISBN-13:978-1491999318
2. *SerhanYamacli* , Beginner's Guide to IOS 11 App Development Using Swift 4: Xcode, Swift and App Design Fundamentals, *Createspace Independent Publishing Platform*; 1 edition, 2017, ISBN-13:978-1977891754
3. *Donny Wals*, Mastering iOS 11 Programming, *Packt Publishing Limited*, 2017, ISBN-13: 978-1788398237
4. *Molly K. Maskrey*, Beginning iPhone Development with Swift 4: Exploring the iOS SDK , *Apress*; 4th ed. edition (27 November 2017), ISBN-13: 978-1484230718
5. *Christian Keur and Aaron Hillegass*, iOS Programming: The Big Nerd Ranch Guide (6th Edition), *Big Nerd Ranch Guides*; 6th Edition, 2017, ISBN-13:978-0134682334.
6. *Web Reference*:<https://developer.apple.com/>

KAD 2305 IOS APP DEVELOPMENT – II

COURSE DESCRIPTION

This course works in conjunction with the iOS app development I course and enables students to use advanced features of iOS. By assessing the storage mechanism, gestures and orientations the students can design robust solutions. The knowledge of media framework, social network integration, and background processing can be applied to make projects that cater to a wider range of customers. The universal application development and submission guidelines allow students to deploy projects into App-Store.

COURSE LEARNING OUTCOMES

Learning Outcomes		Cognitive Level
CLO1	Understand the Multimedia framework and its implementation	Understand
CLO2	Apply universal applications and Submission guidelines	Apply
CLO3	Analyze touch and gestures, orientation and motion, tilt and rotation	Analyze
CLO4	Evaluate different data storage mechanisms and their implementation using Core Data and Key Chain functions	Evaluate
CLO5	Create applications using Responsive User Interfaces, Advanced controllers, Background Processing, Testing, social networking integration, and web services	Create

Mapping of course outcomes with programme outcomes - Low=1, medium=2, High=3

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1	1	2	2	2	3			1
CLO2	2		1	1				
CLO3	3	2	2	2	3			2
CLO4	3		2	2				2
CLO5	3	3	3	3	3			3

Module I

Advanced Storyboards Using Navigation and Tab Bar Controllers: Navigation Controllers, Tab Bar Controllers, Sharing Data between Tab Bar Scenes, Navigation Information using Table Views and Split View Controllers.

Module II

Introduction to Data Storage Mechanisms in iOS, Plist Files, File System Storage, Data Management using Core Data, Search Result Controller, Modeling in Core Data, Key Chain Storage.

Module III

Building Responsive User Interfaces: Designing Rotatable and Resizable Interfaces, Auto Layout, Programmatically Defined Interfaces, Size Classes and Stack View.

Touches and Gestures: Multitouch Gestures Recognition, Adding and Using Gesture Recognition. Sensing Orientation and Motion: Understanding Motion Hardware, Accessing Orientation and Motion Data, Sensing Orientation, Detecting Acceleration, Tilt and Rotation.

Module IV

Media Player Frameworks, Image Picker, Accessing and Playing the Music Library, Using the Address Book, Email, Social Networking, Ad Integration, Web Services.

Module V

Understanding iOS Backgrounding, Disabling Backgrounding, Handling Background Suspension, Using Task-Specific Background Processing, Building Universal Applications: Configuring a project as Universal, Universal Tools and Techniques, Submission Guidelines, Test Flight.

REFERENCES

1. *Matt Neuburg, iOS 11 Programming Fundamentals with Swift: Swift, Xcode, and Cocoa Basics, 1st Edition, O'Reilly Media; 1 edition (October 19, 2017), ISBN-13: 978-1491999318*
2. *Donny Wals, Mastering iOS 11 Programming, Packt Publishing Limited; 2nd Revised edition edition (27 October 2017), ISBN-10:1788398238*
3. *Matt Neuberg, iOS 11 Programming FundamentalswithSwift, O'Reilly (6 October 2017),ISBN-13:978-1491999318*
4. *Christian Keur and Aaron Hillegass, iOS Programming, Big Nerd Ranch Guides; 6 edition (January 6, 2017), ISBN-13:978-0134682334.*
5. *Rory Lewis, Laurence Moroney, iPhone and iPad Apps for Absolute Beginners , revised - Apress, 2014, ISBN-13 :9781430263623*
6. *Web Reference:<https://developer.apple.com/>*

KAD 2308 SOFTWARE LAB III (IOS & SWIFT)

COURSE DESCRIPTION

The goal of this course is to provide hands-on experience in using iOS and its related framework. The concepts taught in courses Programming with Swift, iOS app Development I and II are applied in production scenarios to provide in-depth knowledge and expertise in iOS framework and application development.

COURSE LEARNING OUTCOMES

Learning Outcomes		Cognitive Level
CLO1	Develop projects using the iOS framework	Create
CLO2	Develop solutions based on advanced iOS frameworks	Create
CLO3	Deploy Swift based projects	Create

Mapping of course outcomes with programme outcomes - Low=1, medium=2, High=3

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1	3	2	3	3	3			3
CLO2	3	3	3	3	3			3
CLO3	3	3	3	3				3

The Lab is based on the practical oriented papers Programming with Swift , iOS App development I & iOS App development II.

Module I

iOS App development I: Implement iOS apps using following basic concepts

- Basic Concepts: Storyboard-Single, Multiscene, Code, Outlets, Segues and Patterns.
- MVC: Single View Application Template.
- Table View: Create, Edit, Delete, Cocoa Fundamentals
- Controls: Labels, Text Views, Buttons, Image Views, Animations, Sliders, Steppers, Search Box, Switch, Segmented Controls.
- Views: Web, Scrolling, Table, Split.
- Navigation and Tab Bar Controllers, Sharing Data between Tab Bar Scenes
- Table Views and Split View Controllers
- Auto Layout and Responsive User Interfaces
- Universal and Background-Ready Applications
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Module II

iOS App development II: Advanced level expertise in iOS App development using following concepts and frameworks

- Data Storage: Files, Core Data, Key Chain Storage.

- Search Result Controller
- Touches and Gestures
- Orientation and Motion
- Image Picker and Media Player
- Address Book, E-mail and Browser
- Core Location and MapKit : Current location and Annotation
- Geofencing events handling
- Local and Push Notifications
- Working with CloudKit
- Familiarity with Extensions and 3DTouch
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Module III

Swift: Familiarize the following swift programming concepts through iOS App development.

- Basics: Scope & Lifetime, Namespace, Module, Instances.
- Collections and Flow Control
- Functions and Closures.
- Optionals.
- Structure and classes
- Methods
- Protocols and Delegates
- Extensions
- Generics
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REFERENCES

1. *Matt Neuberg, iOS 11 Programming Fundamentals with Swift, O'Reilly, 2017, ISBN- 13:978-1491999318*
2. *SerhanYamacli , Beginner's Guide to IOS 11 App Development Using Swift 4: Xcode, Swift and App Design Fundamentals, Createspace Independent Publishing Platform; 1 edition, 2017, ISBN-13:978-1977891754*
3. *Jon Hoffman, Mastering Swift 4 - Fourth Edition: An in-depth and comprehensive guide to modern programming techniques with Swift, Packt publishing, 2017, ISBN-13: 978- 1788477802*
4. *Matt Neuburg, Programming iOS 11: Dive Deep into Views, View Controllers, and Frameworks, 1st Edition, O'Reilly Media, January 2018, ISBN-13:978-1491999226*
5. *Kyle Richter, Joe Keeley, Mastering iOS Frameworks: Beyond the Basics, Addison- Wesley Professional, 2015, ISBN-13 :9780134052526*
6. *Donny Wals, Mastering iOS 11 Programming - Second Edition: Build professional-grade iOS applications with Swift 4 and Xcode, Packt publishing, 2017, ISBN-13: 978- 1788398237*
7. *Web Reference:<https://developer.apple.com/>*