# EE4304: IOS MOBILE APP DEVELOPMENT AND NETWORKING

**Effective Term**
Semester A 2022/23

## Part I Course Overview

**Course Title**
iOS Mobile App Development and Networking

**Subject Code**
EE - Electrical Engineering
**Course Number**
4304

**Academic Unit**
Electrical Engineering (EE)

**College/School**
College of Engineering (EG)

**Course Duration**
One Semester

**Credit Units**
3

**Level**
B1, B2, B3, B4 - Bachelor's Degree

**Medium of Instruction**
English

**Medium of Assessment**
English

**Prerequisites**
EE3206 Java Programming and Applications

**Precursors**
Nil

**Equivalent Courses**
Nil

**Exclusive Courses**
Nil

# Part II Course Details

**Abstract**

The course aims to provide students with an understanding of the principle and hands-on experience on iOS app development and networking with use of Swift programming language. The course combines a conceptual overview, design issues, and practical development via iOS app development projects. Students will learn to use iOS development tools such as Xcode, design interfaces and interactions, evaluate usability, and integrate peripherals such as camera, motion sensor and geolocation to enhance iOS apps.

**Course Intended Learning Outcomes (CILOs)**

| | CILOs | Weighting (if app.) | DEC-A1 | DEC-A2 | DEC-A3 |
|---|---|---|---|---|---|
| 1 | Describe the principles and architectures of iOS system. | | x | | |
| 2 | Use Swift language to express iOS application logic structurally. | | x | x | |
| 3 | Create highly usable interfaces and interactions with Xcode Interface Builder. | | x | x | |
| 4 | Apply system-level techniques such as multitasking, networking and persisting data to database. | | x | x | |

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

**Teaching and Learning Activities (TLAs)**

| | TLAs | Brief Description | CILO No. | Hours/week (if applicable) |
|---|---|---|---|---|
| 1 | Lectures | Key concepts are described and illustrated. | 1, 2, 3, 4 | 3 hrs/wk |
| 2 | Labs | Lab exercises on related topics are provided for students to work out the key concepts and get hands-on experience of mobile application development. | 1, 2, 3, 4 | |

| | | | | |
|---|---|---|---|---|
| 3 | Group project with discussion, presentation and written reports | The group project is carried out by a team of 5 students. They are required to plan their tasks and schedule so as to allow members to work collaboratively.<br><br>Group discussions are done in class to study user habits and market needs on mobile applications. Each group will perform the requirements analysis on a specific topic proposed.<br><br>Students are required to present their group project and progress in both oral and written form according to the given guideline and standard. Certain deliverables such as presentation, written reports will be collected as evidences. | 1, 2, 3, 4 | |

**Assessment Tasks / Activities (ATs)**

| | ATs | CILO No. | Weighting (%) | Remarks (e.g. Parameter for GenAI use) |
|---|---|---|---|---|
| 1 | Tests (min.: 2) | 1, 2, 3, 4 | 42 | |
| 2 | #Assignments (min.: 3) | 1, 2, 3, 4 | 20 | |
| 3 | Lab Exercises/Reports | 1, 2, 3, 4 | 8 | |

**Continuous Assessment (%)**

70

**Examination (%)**

30

**Examination Duration (Hours)**

2

**Additional Information for ATs**

Remark:
To pass the course, students are required to achieve at least 30% in course work and 30% in the examination.
# may include homework, tutorial exercise, project/mini-project, presentation

Shared computing equipment will be provided in laboratory for the use of this course. Meanwhile, in order to facilitate the course assessment works, students in this course are also required to have their own Mac computer.

**Assessment Rubrics (AR)**

**Assessment Task**
Continuous assessment

**Criterion**
Achievements in CILOs

**Excellent (A+, A, A-)**
High

**Good (B+, B, B-)**
Significant

**Fair (C+, C, C-)**
Moderate

**Marginal (D)**
Basic

**Failure (F)**
Not even reaching marginal levels

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**Assessment Task**
Examination

**Criterion**
Achievements in CILOs

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# Part III Other Information

**Keyword Syllabus**

iOS App Design and Development Principles
Overview of iOS History, iOS Devices, iOS App Markets, iOS Design Principles, iOS Software Architecture, iOS Development Tools, Xcode, iOS Programming Languages of Swift and Objective-C, Objective-C Compatibility, Foundation Frameworks, Model-View-Controller (MVC), Multiple MVCs, Delegation Pattern

Best Practices for iOS User Interface and Functionality Design

UI Overview, Views, Gestures, View Controller Lifecycle, Storyboard, Autolayout, Scroll View, Multithreading, Table View, Unwind Segues, Alerts, Timers, View Animation, Dynamic Animation, Application Lifecycle, Core Motion, Core Location, Map Kit, Modal Segues, Camera, Persistence, Embed Segues, Internationalization and Settings, Dependency Management with CocoaPods

iOS Networking and Security
Web API Security and Data Transport, iOS Secure Network Setting, Basic OAuth2 Functionality, Secure JSON Web APIs, Cryptographically Secured Push Notifications, Core Data, Secure Data Storage

iOS App Software Engineering
Software Development Cycles, Requirements Capture, Automated Testing, Test-Driven Development, Debugging, Deployment to Market, Distribution of iOS App through the App Store, Monetization

**Reading List**

**Compulsory Readings**

| | Title |
|---|---|
| 1 | Matt Neuburg, iOS 9 Programming Fundamentals with Swift, (O' Reilly Media, September 2015) |
| 2 | The Swift Programming Language, Swift Programming Series, Apple Inc. |

**Additional Readings**

| | Title |
|---|---|
| 1 | Nil |