Program Content

Semester	VI		
Course Code:	IT6306		
Course Name:	Mobile Application Development		
Credit Value:	4 (2L + 2P)		
Core/Optional	Core		
Hourly Breakdown	Theory	Practical	Independent Learning
	30 Hrs	60 Hrs	110 Hrs

Course Aims:

- Develop an understanding of contemporary mobile development platforms and skills required to develop applications for mobile devices
- Explore a range of technical problems and solutions inherent in developing software applications for mobile devices including connectivity, security, and data storage.
- Explain the key challenges in creating usable and effective interactive mobile applications and design techniques to address them
- Develop an understanding of the unique features of contemporary mobile devices and how they can be used in interactive mobile application

Intended Learning Outcomes:

After following this course, students should be able to

LO1: Explain the major milestones in the evolution of mobile devices
LO2: Compare multiple mobile application development approaches
LO3: Develop interactive mobile applications using a modern mobile development environment.
LO4: Identify solutions to problems relating to interactive mobile applications.
LO5: Design a moderately complex native mobile application in Android.
LO6: Develop mobile applications for distribution on the Google Play Store.

Course Content: (Main Topics, Subtopics)

Topic	Theory (Hrs.)	Practical (Hrs.)
1. Introduction to Mobile Applications	02	-
2. Comparison of Mobile Application Development Platforms	03	-
3. Designing for Mobile Applications	04	08
4. Native Application Development with Android	12	30
5. Android Architecture Components and Room Database	06	14
6. Deployment and Monetization	03	08
Total	**30**	**60**

1. **Introduction to mobile applications (02 hours)**
   - 1.1. The term "Mobility" in general [Ref 1: Pg. (19-28)]
   - 1.2. History of Mobile devices [Ref 3: pg 1-3]
     - 1.2.1. The brick era [Ref 3: pg 3-4]
     - 1.2.2. The candy bar era [Ref 3: pg 5]
     - 1.2.3. The feature phone era [Ref 3: pg 6-7]
     - 1.2.4. The smart phone era [Ref 3: pg 8-9]
     - 1.2.5. The touch era [Ref 3: pg 10-12]
   - 1.3. Layers of mobile eco system [Ref 3: pg 13]
     - 1.3.1. Operators [Ref 3: pg 14-16]
     - 1.3.2. Networks [Ref 3: pg 17]
     - 1.3.3. Devices [Ref 3: pg 18-19]
     - 1.3.4. Platforms [Ref 3: pg 20-21]
     - 1.3.5. Operating systems [Ref 3: pg 13]
     - 1.3.6. Application Frameworks [Ref 3: pg 22-25]
     - 1.3.7. Applications [Ref 3: pg 25]
     - 1.3.8. Services [Ref 3: pg 26]
   - 1.4. Developing a mobile strategy [Ref 3: pg 57-67]

2. **Mobile application development platforms (03 hours)**
   - 2.1. Introduction to mobile application development platforms [Ref 2: pg.109-110]
   - 2.2. Android development platform [Ref 2: pg.151-153]
   - 2.3. iOS development platform [Ref 2: pg.183-187]
   - 2.4. Selecting the proper development platform [Ref 2: pg. 2-6]

3. **Design for mobile applications (04 hours)**
   - 3.1. Introduction to mobile design [Ref 3: pg 109-115]
   - 3.2. Elements of mobile design [Ref 3: Chap 8, 4]
     - 3.2.1. Context [Ref 3: pg 116]
     - 3.2.2. Message [Ref 3: pg 117]
     - 3.2.3. Look and feel [Ref 3: pg 118-120]
     - 3.2.4. Layout [Ref 3: pg 121-124]
     - 3.2.5. Color [Ref 3: pg 125-128]
     - 3.2.6. Typography [Ref 3: pg 129-133]
     - 3.2.7. Graphics [Ref 3: pg 134-136]
   - 3.3. Popular prototyping platforms (e.g., Proto.io, Figma, etc.) [Ref 4]

4. **Native Application Development with Android (12 hours)**
   - 4.1. Getting started with Android development
     - 4.1.1. Introduction to Android development [Ref 1]
     - 4.1.2. Setting up the tools and environment [Ref 1]
   - 4.2. Working with User Interfaces
     - 4.2.1. App manifest and resources [Ref 1]
     - 4.2.2.Activities and Fragments (Activity Life Cycle, Fragment Life Cycle) [Ref 1]
     - 4.2.3.Layouts, Adapters, Action bar, Dialogs and Notifications [Ref 1]
   - 4.3. Data and App interaction
     - 4.3.1.Intents and Broadcast Receivers [Ref 1]

4.3.2.Preferences and Saving State [Ref 1]
4.3.3.Content Providers and Services [Ref 1]
4.3.4. AsyncTask and AsyncTaskLoader [Ref 1]
4.4. Sensors and Communication
4.4.1.Sensors (Sensor Identification and Registration) [Ref 1]
4.4.2.Orientation and Movement (Pitch, roll and yaw, Natural Device Orientation, Reference frame remapping) [Ref 1]
4.4.3.Sending and Receiving SMS [Ref 1]

5. Android Architecture Components and Room Database (06 hours)

5.1. Introduction to Android Architecture Components
5.1.1.Activity / Fragment [Ref 1]
5.1.2.ViewModel [Ref 1]
5.1.3.Repository [Ref 1]
5.2. Room Database
5.2.1.Room Overview [Ref 1]
5.2.2.Components of Room
5.2.2.1. Entity [Ref 1]
5.2.2.2. DAO (Data Access Object) [Ref 1]
5.2.2.3. Database [Ref 1]
5.3. Lifecycle-aware Components
5.3.1.Usecases and Lifecycle library [Ref 1]
5.3.2.Lifecycle Events and Observers [Ref 1]
5.3.3.LiveData [Ref 1]

6. Deployment and Monetization (03 hours)

6.1. Deploying the Android App
6.1.1. App releasing strategies [Ref 1]
6.1.2.Prepare for release [Ref 1]
6.1.3. Versioning the app [Ref 1]
6.1.4. Sign the app [Ref 1]
6.1.5. Uploading the app [Ref 1
6.1.6. Choosing the right monetization strategy [Ref 1]
6.1.7. Google Play's subscription platform [Ref 1]
6.1.8. Using Google AdMob [Ref 1]

Teaching /Learning Methods:

You can access all learning materials and this syllabus in the VLE: http://vle.bit.lk/ if you are a registered student of the BIT degree program.

Assessment Strategy:

Continuous Assessments/Assignments:

In the course, case studies/Lab sheets will be introduced, and students have to participate in the learning activities.

Final Exam:
The final exam of the course will be held at the end of the semester. This course is evaluated using a two-hour question paper consisting of 4 Structured Questions.

References/ Reading Materials:

- **Ref 1.** Android Official Documentation. 2021. [online]
  Available at: <https://developer.android.com/>

- **Ref 2.** McWherter, J., & Gowell, S. (2012). Professional mobile application development. John Wiley & Sons, Incorporated.

- **Ref 3.** Brian Fling, (2009). Mobile Design and Development (Practical techniques for creating mobile sites and web apps. O'Reilly Media, Inc.

Supplementary resources:

Ref 4. https://help.figma.com/hc/en-us/articles/360040314193-Guide-to-prototyping-in-Figma