

SYLLABUS

MOBILE APPLICATION DEVELOPMENT

1. GENERAL INFORMATION:

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| Course name: | Mobile Application Development |
| Course website: | (TBA) |
| Lecturer: | Dr. Tuan A. Nguyen |
| | Email: tuanna@uit.edu.vn |
| Tutors: | TBA |
| Credits : | 3 |
| | Theory: 2 Lab : 1 |
| Class hours : | 30 hours (1 academic hour ~ 45 minutes) |
| Labs: | 15 hours |
| Self study : | 15 hours |
| Course properties : | Mandatory for Students in the Computer Network and Communication faculty |
| Prequisites courses/ Pre-known knowledge: | Fundamental programming, Object oriented programming, Java Programming Language. |

2. OBJECTIVES:

- This course provides the foundational knowledge for the development of applications on mobile devices. In addition, students will be equipped with the knowledge of mobile pervasive computing to develop applications on smartphones.
- In terms of skills, students will be equipped with knowledge of programming on Android operating system so that students can build their software in a creatively way.
- In addition, students are also introduced a cross platform (PhoneGap) to develop applications on multiple operating systems, different mobile: such as Android and iOS.

3. COURSE BRIEF CONTENTS:

- Introduction to Mobile Pervasive Computing
- Introduction to Android Programming
- Graphic User Interface Design for Mobile Devices Using Statecharts
- Multithreading on Android.
- Networking & Web Services, and SQL Lite
- Working with Sensors: GPS, Camera.
- The PhoneGap CrossPlatform.

4. Outcome Standard:

| Descriptions | Goals |
|--|-----------|
| Network application development | G1(1.3.2) |
| Design of wired and wireless mobile networks | G2(1.3.3) |
| Survey of Print and Electronic Literature, Experimental Inquiry, Hypothesis Test and Defense | G3(2.2.2) |
| Thinking Holistically | G4(2.3.1) |
| Understanding Needs and Setting Goals | G5(2.4.1) |
| Development Project Management | G6(2.4.2) |
| The Design Process | G7(2.5.1) |
| Test, Verification, Validation and Certification | G8(2.6.2) |

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| Designing and Optimizing Sustainable and Safe Operations | G9(2.7.1) |
| Reading/Writing Technical Reports, Documents in English | G10(2.10.1) |

5. COURSE CONTENTS

| Session | Contents | Goal | Activities |
|---------|---|------------------|---|
| 1 | Chapter 1. Introduction to Mobile Pervasive Computing 1.1 Mobile Pervasive Computing 1.2 What is context ? 1.3 How to use context? 1.4 Smartphones for the 21th Century | G1 | Reading [2]. Chap. 1-3 [3]. Chap. 1-3 |
| 2 | Chapter 2: Introduction to Android Operaitng System 2.1 Android Architecture 2.2 Android SDK 2.3 The “ Hello World ” program 2.4 Debuging with Logcat | G1,G2 | Reading [1]. Chap. 1-3 |
| 3 | Chapter 3. GUI programming on Android 3.1 The Phylosophy of Designing GUI for Mobile Devices 3.2 Constructing GUI using statecharts 3.3 Android Activities | G2,G3, G4, G8 | Reading [4]. Chapter 2-8 |
| 4 | Chapter 4. Restful Web Sevice 4.1 What is Restful Web Service 4.2 Using web service with http Component 4.3 Case study 1: Cool Mobile Ordering. | G1, G5 | Reading [5]. Chap 5,8 |
| 5 | Chapter 5: JSON and SQLite 5.1 Introduction to JSON 5.2 Using JSON in Web Service. | G5,G7 | Reading [1]. Chap. 7 |

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| | 5.3 Introduction to SQLite. 5.4 SQLite queries 5.5 Case study 2: Advanced Mobile Ordering. | | |
| 6 | Chapter 6. Multi-thread and multi-activity 6.1 Introduction to Multithread on Android 6.2 Multi-activity on Android 6.3 Intent and Broadcast Receiver | G1,G2 | Reading [1]. Chap. 3,5 |
| 7 | Assignment | G6,G7 | |
| 8 | Chapter 7: Sensors and Context-aware applications 7.1 Mobile phone's sensors: GPS, Accelerometer, Digital Compass. 7.2 Utilizing sensors on Android 7.3 Constructing context-aware application. | G1,G4 | Reading [1]. Chap. 8,11,14 |
| 9 | Chapter 8: Advanced Android Programming 8.1 Jelly Beans Camera API 8.2 OpenCV on Android 8.3 Augmented Reality on Android | G2, G3, G7, G8 | Reading [1]. Chap. 8,11,14 |
| 10 | Mid term examination | G10 | |
| 11 | Chapter 9: Cross platform programming with Phonegap. 9.1 Introduction to PhoneGap 9.2 Introduction to HTML5, CSS, Javascript 9.3 "Hello World" program using PhoneGap | G1, G3, G4, G8 | Reading [6] |
| 12 | Chapter 10. Publishing applications 1.1 Introduction to Google Play Store. 10.2 Preparing icons. | G7,G9 | Reading [7] |

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| | 10.3 Publishing to Google Play Store regulations. | | |
| 13 | Assignment Presentation | G6,G9 | |
| 14 | Final Exam | G5,G10 | |

6. TEACHING & LEARNING METHODOLOGY

Students attend lectures, do assignments and do presentations. Students are encouraged to be creative, to find the research topics and to practice problem solving skill.

7. EVALUATION

| Format | Goals | Ratio % |
|--------------------|--------------|---------|
| A1. Lab practicing | G1,G2,G7 | 10 |
| A2. Mid-term exam | G1,G4,G5 | 20 |
| A3. Assignment | G2,G6,G9,G10 | 30 |
| A4. Final Exam | G6,G7,G9 | 40 |

8. REFERENCE BOOKS:

- [1] Meier, R., Professional **Android** 4 Application Development, *Wrox Press Ltd.*, 2014.
- [2] Loke, S. W., Context-Aware Pervasive Systems: Architectures for a New Breed of Applications, *Auerbach Publications*, 2006, 240
- [3] Poslad, S., Ubiquitous Computing: Smart Devices, Environments and Interactions
Wiley, 2009, 502
- [4] Horrocks, I., Constructing the User Interface With Statecharts, *Addison-Wesley*, 1999
- [5] Mitchell, L., PHP Web Services: APIs for the Modern Web, *O'Reilly Media, Incorporated*, 2013
- [6] PhoneGap, <http://docs.phonegap.com/en/3.0.0/index.html>
- [7] Google Play Store Publishing,
<http://developer.android.com/distribute/googleplay/publish/index.html>

9. SOFTWARE

- Google Android SDK, <http://www.android.com>
- PhoneGap SDK, <http://phonegap.com>
- Open Office or Microsoft Office
- Mindmap tools: Freemind, <http://freemind.sourceforge.net/>

Lecturer

