

Course Specification

Name of Institution	Mahidol University
Campus/faculty/department	Salaya campus Mahidol University International College Science Division

Section 1 General Information

1. Course Code and course title

(Thai)	EGCI428	การเขียนโปรแกรมอุปกรณ์เคลื่อนที่
(English)	EGCI 428	Mobile Device Programming

2. Number of Credits 4(4-0-8) (Lecture/Lab/Self-study)

3. Curriculum and type of subject

3.1 Curriculum	Bachelor of Engineering (Computer Engineering)
3.2 Type of subject	Major elective course

4. Responsible faculty member

Dr. Lalita Narupiyakul

5. Trimester / year of study

5.1 Trimester	1 st / year of study	4 th year
5.2 Number of students	7-30 students	

6. Pre-requisite(s) none

7. Co-requisite(s) none

8. Venue of study Mahidol University, Salaya campus

9. Date of latest revision 2 September 2019

Section 2 Goals and Objectives

1. Goal

1. Students should explain basic principle of mobile application architecture.
2. Students should be able to design and write mobile programming language.
3. Students should be able to apply mobile programming to solve engineering problems.

2. Objective of development revision

To up-date the knowledge content of the course

Section 3 Course Management

1. Course Description

(Thai) พื้นฐานการออกแบบโปรแกรมอุปกรณ์เคลื่อนที่ แนวคิดของเทคโนโลยีอุปกรณ์เคลื่อนที่ พื้นฐานการเขียนโปรแกรมอุปกรณ์เคลื่อนที่ การออกแบบส่วนต่อประสาน การเชื่อมต่อฐานข้อมูล การควบคุมเครื่องรับระยะไกล ระบบบริการเว็บเคลื่อนที่ พัฒนาระบบสำหรับโปรแกรมประยุกต์อุปกรณ์เคลื่อนที่ด้วยบริการประกาศ

(English) Fundamental of the mobile device programming; concept of mobile device technology; basic mobile device programming; user-interface design; database connection; remote sensors controlling; mobile web services; Develop a prototype for the mobile device application for with notification services.

2. Credit hours / trimester

Lecture (hours)	Additional Class (hours)	Laboratory/field trip/internship (hours)	Self-study (hours)
48 hours (4 hours x 12weeks)	-	-	96 hours (8 hours x 12 weeks)

3. Numbers of hours that the lecturer provides individual counseling and guidance

1 hour/week

Section 4 Development of Students' Learning Outcome

1. Expected outcome on students' skill and knowledge

Student will be able to apply the knowledge from lecturer and additional research with the ideas received from analysis and synthesis to set up solutions / precautions to benefit individuals and their community.

2. Teaching Methods

- Lecture
- Self-study
- Exercises

3. Evaluation methods

1. Morality and Ethics

1.1 Expected outcome on morality and ethics:

- 1.1.1 To be aware of values and morality, ethics, scarification and honesty.
- 1.1.2 To process self-discipline, punctuality, self-responsibility and social responsibility
- 1.1.3 To process leadership and supporter skills and be able to work in a team with integrity and cooperation.
- 1.1.4 To demonstrate good listening behavior and have respect for the rights and value of others.

- 1.1.5 To pay respect to the rule of organization and social.
- 1.1.6 To demonstrate the ability to analyze ethical impacts of computer usage to personals, organizations and social.
- 1.1.7 To demonstrate good academic ethical behaviors.

1.2 **Teaching methods:**

Learning Centered Education: Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

- 1.2.1 Lecture
- 1.2.2 Emphasis on morality and ethics
- 1.2.3 Group assignments
- 1.2.4 Group discussion

1.3 **Evaluation methods:**

- 1.3.1 Written examination
- 1.3.2 Presentation
- 1.3.3 Class attendance, class participation and behavior in class
- 1.3.4 On-time submission of reports and assignments and their quality

2 **Knowledge development**

2.1 **Expected outcome on knowledge development:**

- 2.1.1 To process the knowledge related to principles, theories and practice in the course
- 2.1.2 To be able to analyze, understand and explain the computer requirements and be able to apply knowledge and skills using the appropriate tools to solve a problem.
- 2.1.3 To be able analyze, design and install and/or evaluate computer components to meet the requirements of the users
- 2.1.4 To have the ability to remain current in research, and pursue new knowledge and perform ability to apply the knowledge.
- 2.1.5 To know, understand and perform eagerness to develop computer knowledge and skills continuously.
- 2.1.6 To have a breadth knowledge in order to oversee the changes and understand the impact of new technology.
- 2.1.7 To have a hand-on experience in software development and/or software applications.
- 2.1.8 To demonstrate knowledge integration with other related sciences.

2.2 **Teaching methods:**

Learning Centered Education: Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

- 2.2.1 Lecture and in-class participation
- 2.2.2 Case studies with past experiences and current events
- 2.2.3 Self study

2.3 **Evaluation methods:**

- 2.3.1 Written examination
- 2.3.2** Quality of reports and assignments

3. Intellectual development

3.1 *Expected outcome on intellectual development:*

- 3.1.1 To have discretionary and systematic thinking skill.
- 3.1.2 To have the ability to search, consolidate and evaluate ideas and evidence for problem solving.
- 3.1.3 To be able to apply knowledge and experience to analyze and creatively solve problems both in general and in academic contexts.
- 3.1.4 To be able to apply knowledge and experience to synthesize solution and precautions

3.2 *Teaching method:*

- 3.2.1 Systematic problem solving examples and case studies with past experiences and current events
- 3.2.2 Self Study

3.3 *Evaluation methods:*

- 3.3.1 Written examination
- 3.3.2 Presentation
- 3.3.3** Quality of reports and assignments

4. Interpersonal relationship and responsibility

4.1 *Expected outcome on interpersonal relationship and responsibility:*

- 4.1.1 To perform good communication skills with various groups of people.
- 4.1.2 To be a constructive team member (in various roles).
- 4.1.3 To process the knowledge of the course to identify social problems.
- 4.1.4 To demonstrate self and team responsibility.
- 4.1.5 To have initiative in problem solving.
- 4.1.6 To demonstrate leadership qualities in uncertain situations.
- 4.1.7 To take responsibility in a life-long learning.

4.2 *Teaching methods:*

- 4.2.1 Group discussion in case studies
- 4.2.2 Group discussion
- 4.2.3 Group assignment

4.3 *Evaluation methods:*

- 4.3.1 Presentation
- 4.3.2 Class attendance, class participation and behavior in class
- 4.3.3 On-time submission of reports and assignments and their quality

5. Mathematical analytical thinking, communication skills and information technology skills

5.1 *Expected outcome on mathematical analytical thinking, communication skills and information technology skills:*

- 5.1.1 To be able to select and apply existing tools for computer related work.

- 5.1.2 To possess the ability to apply information technology for data gathering, processing, interpreting and presenting information/results.
- 5.1.3 To have the ability to communicate effectively and select appropriate methods for presentation.
- 5.1.4 To use information technology appropriately.

5.2 Teaching methods:

- 5.2.1 Computer programming with exercises.
- 5.2.2 Case studies with past experiences and current events
- 5.2.3 Group discussion
- 5.2.4 Group assignment
- 5.2.5 Self Study

5.3 Evaluation methods:

- 5.3.1 Written examination
- 5.3.2 Presentation with appropriate technology
- 5.3.3 Class attendance, class participation and behavior in class
- 5.3.4 On-time submission of reports and assignments and their quality

Section 5 Teaching and Evaluation Plans

1. Teaching plan

week	Topics	Hours			Teaching methods/multi media	Instructor
		Lecture	Lab	Self-Study		
1	Introduction to Mobile Application Architectures	4	0	8	Lecture and programming exercises	Dr. Lalita Narupiyakul
2	Mobile Programming Languages	4	0	8	Lecture and programming exercises	
3	Fundamental of Mobile Applications and Development (1)	4	0	8	Lecture and programming exercises	
4	Fundamental of Mobile Applications and Development (2)	4	0	8	Lecture and programming 4exercises	
5	Database System on Mobile Devices	4	0	8	Lecture and programming exercises	
6	Data Connectivity and Web Services on Mobile Devices	4	0	8	Lecture and programming exercises	
7	Develop a Simple Mobile Application Prototype	4	0	8	Lecture and programming exercises	

8	User Interface Design and Screen Control on Mobile Devices	4	0	8	Lecture and programming exercises
9	Audio and Video Control on Mobile Devices	4	0	8	Lecture and programming exercises
10	Sensors and Network Connection on Mobile Devices	4	0	8	Lecture and programming exercises
11	Advanced topics in mobile application development (1)	4	0	8	Lecture and programming exercises
12	Advanced topics in mobile application development (2)	4	0	8	Lecture and programming exercises
13	Final Examination				
	Total	48	0	96	

2. Evaluation Plan

Expected outcomes	Methods / activities	Week	Percentage
1.1.1, 1.1.2, 1.1.7, 4.1.1, 4.1.4, 4.1.5, 5.1.4	Attendance and in class behavior	1-12	10%
2.1.1, 2.1.3, 3.1.1, 3.1.4, 5.1.2	Final examination	13	30%
2.1.7, 2.1.8, 3.1.3, 5.1.1	Exercises, Project and Programming	1-12	60%

Section 6 Teaching Materials and Resources

1. Texts and main documents

- Swift 4, <https://developer.apple.com/swift/>
- Kotlin for Android, <https://kotlinlang.org/docs/tutorials/kotlin-android.html>

2. Documents and important information

none

3. Documents and recommended information

- The Swift Programming Language: Swift 4 Edition (Swift 4 Beta), iBook, Apple Inc., 2017
- Michael Fordham, Kotlin Development for Android: (Create Your Own App), Independently published, August 2017.

Section 7 Evaluation and Improvement of Course Management

- 1. Strategies for effective course evaluation by students**
 - 1.1 Evaluation of peers by students
 - 1.2 Student evaluation
 - 1.2.1 Course content
 - 1.2.2 Course management
 - 1.2.3 Suggestions
 - 1.2.4 Overall opinion

- 2. Evaluation strategies in teaching methods**
 - 2.1 Student evaluation
 - 2.2 Presentation
- 3. Improvement of teaching methods**

Workshop on course improvement with the participation of all instructors in the course
- 4. Evaluation of students' learning outcome**

Analysis of students' learning outcomes using scores from class attendance, group activity and presentation of project and poster presentation
- 5. Review and improvement for better outcome**

Review the course before trimester starts and before each teaching period

Symbol ● represents main responsibility / Symbol ○ represents minor responsibility / Space represent no responsibility
 These symbols will appear in Curriculum Mapping