CS4295: MOBILE APPLICATION PROGRAMMING

Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Mobile Application Programming

Subject Code
CS - Computer Science
Course Number
4295

Academic Unit
Computer Science (CS)

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
(CS2312 Problem Solving and Programming or
CS2313 Computer Programming or
CS2360 Java Programming)
And
(CS1303 Introduction to Internet and Programming or
CS2204 Fundamentals of Internet Applications Development or
CS3201 Computer Networks)

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
CS4298 iOS Application Development

Part II Course Details

Abstract

This course aims to develop technical competence in mobile application programming. An in-depth exploration of common platforms, technologies, programming models and system architectures in mobile application development will be covered. Students are expected to analysis and evaluate various technologies and platforms in mobile application programming, design and write program on mobile devices, and develop a back-end system to extend and enhance the capability of mobile applications.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Identify and describe the characteristics and constraints of programming mobile applications.	15		x	
2	Analyse and evaluate different technologies and platforms in mobile application development.	20	x	x	
3	Provide qualitative evaluation on mobile applications and explores new application that utilizes the sophisticated features of contemporary mobile device.	15	x	x	
4	Explore and develop sophisticated and robust applications on mobile device.	25	x	x	x
5	Design and develop computing system to extend and enhance the capability of mobile applications.	25		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	Lecture	Lectures will cover the essential concept, common platforms and core technologies in mobile application development.	1, 2, 3, 4, 5	3 hours/week

2	Tutorial	Tutorials will be in form of case studies, analytical questions and answers, and programming exercises. Case studies and analytical questions are designed to review the material covered in the lectures and widen students' exposure on the related topics. Programming exercises provide hand-on practices on mobile application programming, students will be familiarized with the programming environment of the selected mobile platform and gain hand-on experience on mobile application programming.	1, 2, 3, 4, 5	8 hours/semester
3	Programming Assignment	Student will develop a mobile application that - demonstrate a good understanding on the characteristics and constraints of mobile application. - utilize the sophisticated features of contemporary mobile device. - explore new application on mobile device.	1, 2, 3, 4, 5	
4	Written assignment	Students will conduct a survey on common mobile applications and provide an evaluation and potential improvement of their findings	1, 2, 3	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Written Assignment	1, 2, 3	15	
2	Quiz	1, 2, 3, 4, 5	20	
3	Programming Assignment	1, 2, 3, 4, 5	15	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

Assessment Rubrics (AR)

Assessment Task

Written Assignment

Criterion

ABILITY to compare different technologies and platforms found in mobile computing systems

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

Assessment Task

Written Assignment

Criterion

ABILITY to provide concise and thorough evaluation on common mobile applications

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

Assessment Task

Programming Assignment

Criterion

ABILITY to identify the characteristics and constraints of the selected mobile platform and consider these factors in developing their application

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

Assessment Task

Programming Assignment

Criterion

ABILITY to justify their system design and implementation based on a thorough understanding on the strength and weakness of various mobile computing technologies

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

Assessment Task

Programming Assignment

Criterion

ABILITY to utilize sophisticated features of contemporary mobile device in developing an innovative mobile application

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

Assessment Task
Programming Assignment

Criterion
DEVELOP robust and sophisticate mobile application

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

Assessment Task
Exam

Criterion
ABILITY to describe and identify the characteristics and constraints of programming mobile application

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

Assessment Task

Exam

Criterion

ABILITY to compare different technologies and platforms found in mobile computing systems and provide justification on their usage based on different scenarios

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

Assessment Task

Exam

Criterion

ABILITY to demonstrate working knowledge on the technologies and skills required to develop computing systems for improving capability and efficiency of mobile application

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

Part III Other Information

Keyword Syllabus

Mobile Platforms and SDK (IOS, Android), Mobile programming (Objective-C, Java, HTML5, CSS), Intents, Activity, Apps Widgets, OpenGL ES, MVC; Mobile User Interface, UI event, notification, touch screen, gesture-based input, speech input, UI Guideline; Sensor integration, accelerometer, tilt, compass and camera; Location-based programming, GPS, indoor and outdoor position techniques; Issue in mobile application development, energy efficiency, memory management, security; Designing for responsiveness services, background tasks and services, multithreading; Mobile computing systems, cloud-based service.

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	Richard Rodger (2012). Beginning Mobile Application Development in the Cloud, Wrox.
2	Ed Burnette (2012). Hello, Android: Introducing Google's Mobile Development Platform. Burnette.
3	Satya Komatineni and Dave MacLean (2012). Pro Android 4. Apress.
4	Steven Hoober, Eric Berkman (2011). Designing Mobile Interfaces. O'Reilly.