

Module 4: New and Emerging Technologies

Stage		1				
Semester		1				
Module Title		New and Emerging technologies				
Module Number		4				
Module Status		Mandatory				
Module ECTS Credits		10				
Module NFQ level		9				
Pre-Requisite Module Titles		None				
Co-Requisite Module Titles		None				
Capstone Module?		No				
List of Module Teaching Personnel		Barry Denby				
Contact Hours				Non-contact Hours		
72				128		
Lecture	Practical	Tutorial	Seminar	Assignment	Placement	Independent Work
36	36			60		68
Allocation of Marks (Within the Module)						
	Continuous Assessment	Project	Practical	Final Examination	Total	
Percentage Contribution	100				100	

Intended Module Learning Outcomes

On successful completion of this module the learner will be able to:

1. write programs for a mobile based environment
2. explain how programs interact with the mobile based environment
3. discuss the key differences between desktop and mobile environments
4. identify the need for custom controls and demonstrate their implementation
5. demonstrate interaction with sensors in the phone (gyroscopes, gps, magnetometer, etc)
6. demonstrate the features of mobile programming.

Module Objectives

This module aims to give the learner the opportunity to study relatively new developments in Computer Science. The currently suggested topic is Mobile Development.

Currently there is great interest in mobile development, with Android and iOS being at the forefront. Smartphone shipments have increased year on year since the release of the original iPhone to the current point where such shipments now exceed the shipments of feature phones. As a result the development opportunities and market for these applications have increased rapidly over the last 5 years. As this is still a relatively new computing and interaction format it would be a great advantage for learners to have experience of developing mobile applications.

In this module learners are introduced to a mobile development platform and learn the processes involved in designing, prototyping, developing, testing and publishing of applications. They are also introduced to the mobile operating system, with explanations of how it differs to a desktop operating system and how this affects their applications.

Module Curriculum

Introduction and motivation

Overview of the subject / What is mobile development? / What restrictions does mobile development pose on applications? / Introduction to mobile platforms / mobile software ecosystem / Pervasiveness of smartphones in today's society

Mobile Operating Systems

Introduction to Android / Introduction to iOS / Differences between Desktop and Mobile OSes / Design issues for mobile applications / Mobile OS constraints

Application Basics

Activities / Views / Widgets / Methods for displaying different categories of information / Activity states / Minimum activity requirements/ Manifest files / Event handling and listeners

Application Flow

What is Flow? / Intents / Notifications / Resources / Layouts / Tasks / Activity stack / Permissions / Passing data with intents / Working with files / SQLite storage / Dialogs

Custom Drawing

2D graphics / Drawing on Views / Basic shapes / text / creating custom controls / Animation / Drawing on canvas

Sensors

GPS and Geocoders / accelerometers / compass / magnetometer

Services

Introduction / Creating background services / Service life cycle / linking to notifications / transferring data to and from services / starting and stopping services / Application Widgets

Communications

Allowing applications to communicate / Creating links between applications / General network access / Methods of data transport over networks (HTTP, XML, JSON etc) / Wifi / Bluetooth / NFC / Mobile data.

Reading Lists and other learning materials

Recommended Reading

Professional Android 4 Development	Meier	John-Wiley and Sons	2012
Hello Android: Introducing Google's Mobile Development Platform	Burnette	Pragmatic Bookshelf	2010
iOS Programming: The Big Nerd Ranch Guide	Conway, Hillegass	Big Nerd Ranch Guides	2012
Beginning iPhone 5 Development: Exploring the iOS 5 SDK	Mark, Nutting, LaMarche	APRESS	2011

Secondary Reading

<http://developer.android.com> Android developer portal

<http://developer.apple.com/devcenter/ios/> Apple iOS developer portal

Additional reading as recommended by lecturer, appropriate to topic and to each learner's area of research.

Module Learning Environment

Accommodation

Lectures are carried out in class rooms / lecture halls in the College. Lab tutorials are carried out in computer labs throughout the Campus. All have the software required to deliver the programme.

Library

All learners have access to an extensive range of physical and electronic (remotely accessible) library resources. The library monitors and updates its resources on an on-going basis, in line with the College's Library Acquisition Policy. Lecturers update reading lists for this course on an annual basis as is the norm with all courses run by Griffith College.

Module Teaching and Learning Strategy

Learners are taught using a combination of classes and practicals. Classes are used to explain the concepts and exemplify the techniques.

Practicals give the learners the opportunity to implement the ideas that are discussed in class and to practice mobile development.

In addition to classes and practicals, learners need to put in at least two hours homework each week.

Module Assessment Strategy

As this module is 100% continuous assessment there are 4 assignments that make up the full 100%.

Element No.	Weighting	Type	Description	Learning Outcomes Assessed
1	15%	Assignment	This assignment will test the learners ability to create a basic mobile application. They will be asked to create an application that will create a number of layouts, widgets and the necessary event handling to make the application interact and function.	1, 2, 3
2	20%	Assignment	This assignment will test the learners ability to generate custom controls. They will be asked to make an application where they must generate a custom widget that is not provided by the toolkit. For example a tic-tac-toe game widget	4, 6
3	25%	Assignment	This assignment will test the learners ability to interact with the various sensors provided on a mobile device. The assignment will ask the learner to write a mobile application to interact with one or two sensors and do something useful. e.g. use the gyroscope to make a basic bubble level app.	5, 6
4	40%	Assignment	This assignment will test the learners ability to realise a mobile application from design to completion. They will be asked to write a mobile application to do a set task (such as a todo list manager, pomodoro clock, etc) They will have a choice of application from a set list and they must choose one.	all