

Soran University
Mobile Computing I and II Module Specification

1. Module Title – Mobile Computing I and II

2. Module Code - CS401MBC

3. Module Level – Fourth Stage

4. Module Leader – Thenraja Vettivelraj

5. Teaching Semester – Fourth year (7th and 8th Semester)

6. Credit Rating for the module – 4 +4 =8 Credits

7. Prerequisites and co-requisites

(Programming Fundamentals, OOPS)

None

8. Module Summary

[A brief summary of the content of the module, and its assessment, when it takes place and any prerequisites]

This course is for students to develop mobile applications on Android platform. It starts from the basics of Android programming and covers the most advanced topics.

One can develop all kind of applications for mobiles and tablets which supports Android OS, with the help of Android SDK and other related tools.

The assessment will be of two coursework and it's 20% each and final exam will be of 60%. The first coursework will be in the 8th week of the first semester and the second coursework will be 16th week of the second semester.

It will be better to have knowledge about programming in advance.

9. Module Aims

[A list of the general things that the module aims to achieve in terms of content and what the student will be able to do upon completion of the module]

- To provide guidelines, design principles and experience in developing applications for Android mobile devices.
- To make sure that the student can make use of most of the technologies in the emerging field of mobile technology.
- Architecture and working principle.
- Can develop the desired applications and they can publish in the Google play store/ in other android sites.
- Can use the technologies like Wifi, Bluetooth, Sensors and networks.
- Knowledge about hybrid applications.

10. Learning Outcomes

[A numbered list of the objectives of the module LO1, LO2, etc. Each outcome should be a specific statement of what the student should be able to do upon completion of the module. Learning objectives should aim to be SMART – Specific, Measurable, Achievable, Realistic]

1. Use the relevant software development kit (SDK) and application programming interfaces (APIs) to create applications for a particular smartphone device.
2. Comparison of different mobile OS, hardware and evolution of mobile phones.
3. Understand the architecture, lifecycle, activities, services and programming principles, and model-view-controller paradigm and use it to create event driven user interfaces for Smartphone applications.
4. Develop applications that are capable of interfacing with Smartphone hardware e.g. camera, compass, Bluetooth, wifi, accelerometer and global positioning system (GPS) receiver.
5. Create network enabled applications for Smartphone devices that are capable of connecting to the Internet and interacting with web services.
6. Develop Smartphone applications with integrated support for multimedia and 2D/3D graphics.
7. Knowledge about creating hybrid applications.
8. Programming in Java.

11. Syllabus

Introduction [1 session]

Evolution of mobile phones

Mobile Technologies

Short introduction of the iPhone, Android, & Blackberry SDK

Mobile system hardware: [1 session]

Restricted hardware devices employed in mobile system. i.e. microprocessors, memory technologies, power requirements and saving, security of applications and code, display devices, input devices, etc

What is Android? [1 session]

Terms used

Android OS

Android platform components

Google play

Screenshots of programming environment setup

Application development under Android [2 sessions]

An introduction to the Android SDK features

Introducing the Application Manifest

Using the Manifest Editor

The Android Application Life Cycle

Understanding Application Priority and Process States

Externalizing Resources

Introducing the Android Application Class

Creating User Interfaces [1 session]

- Fundamental Android UI Design
- Introducing Views
- Introducing Layouts
- Creating New Views
- Drawable Resources
- Resolution and Density Independence
- Creating and Using Menus

Intents, Broadcast Receivers, Adapters, and the Internet [1 session]

- Introducing Intents
- Introducing Pending Intents
- Introducing Adapters
- Using Internet Resources
- Introducing Dialogs

Files, Saving State, and Preferences [1 session]

- Saving Simple Application Data
- Creating and Saving Preferences
- Retrieving Shared Preferences
- Introducing the Preference Activity and Preferences Framework
- Creating a Standard Preference Activity for the Earthquake Viewer
- Saving Activity State
- Saving and Loading Files
- Including Static Files as Resources
- File Management Tools

Database and Content providers [1 session]

- Introducing Android databases
- Introducing SQLite
- Working with SQLite
- Creating content provider
- Using content provider

Maps, Geocoding, and Location-Based Services[1 session]

- Using Location-Based Services
- Selecting a Location Provider
- Finding Your Location
- Using Proximity Alerts
- Using the Geocoder
- Creating Map-Based Activities

Working in the Background [1 session]

- Introducing Services
- Using Background Threads
- Introducing Notifications
- Using Alarms

Invading the Phone-Top [1 session]

- Introducing Home-Screen Widgets
- Creating App Widgets

Introducing Live Folders
Creating Live Wallpaper

Audio, Video, and Using the Camera [1 session]

Playing Audio and Video
Recording Audio and Video
Using the Camera and Taking Pictures
Adding New Media to the Media Store
Raw Audio Manipulation
Speech Recognition

Bluetooth, Networks, and Wi-Fi [2 sessions]

Using Bluetooth
Managing Network Connectivity
Managing Your Wi-Fi

Sensors [1 session]

Using Sensors and the Sensor Manager
Interpreting Sensor Values
Using the Compass, Accelerometer, and Orientation Sensors
Controlling Device Vibration

Telephony and SMS [1 session]

Telephony
Introducing SMS and MMS

Advanced Android Development [2 sessions]

Android Text to Speech
Using Internet Services
Animations
Creating Interactive controls

Hybrid Applications [2 sessions]

Knowledge on creating hybrid apps and comparison
Sencha Touch
jQuery mobile
Phonegap

Future of mobile computing [2 sessions]

Upcoming technologies
Convergence of media & communication devices

12. Assessment Strategy

[This section details how the Learning Outcomes will be assessed. This includes formative as well as summative assessment. Where formative assessment is includes diagnostic testing, informal feedback and non-graded assessment of what a student has learned. Summative assessment is graded assessment based upon formal course work and examinations.

The assessments used should be described, the type of assessment (e.g. essay, examination, presentation, group work), along with what they aim to achieve, and at what stage in the module they take place. Include in brackets which Learning

Outcomes each assessment component is designed to assess e.g. (LO1, LO2, LO3).

There will be two coursework, two class exams and a final theory and practical Exam.

CWK I + Class Exam I – LO1, LO2, LO3, LO8,
 CWK II + Class Exam II – LO1, LO2, LO3, LO4, LO5, LO8
 EXM - LO1, LO2, LO3, LO4, LO5, LO6, LO7, LO8
 Practical EXM – LO1, LO4, LO5, LO8

13. Summary description of assessment items

[A table summarizing the assessment components of the module]

Assessment Type	Description of Item	% Weighting	Grading	Tariff	Week due
CWK I + Class Exam I	Developing an android application + Theory Exam	20%			8 th week
CWK II + Class Exam II	Developing an android application + Theory Exam	20%			16 th week
Final Exam		40%			End of the module
Final Practical Exam		20%			End of the module
Formative Assessment		0%			Throughout the year

[Assessment Type identifies whether it is an exam, a coursework, group work, presentation etc. These can be abbreviated e.g CWK, GWK, EXM, PRS

Description of item - a very brief description of the assessment e.g. design and write a program to manage a bank account

Weighting – the percentage of the module’s total assessment the particular assessment accounts for.

Grading – the grading structure e.g. pass, merit, distinction along with the number of marks or percentages required to achieve those grades.

Tariff – the amount of work required from the student for that assessment e.g. 1000 – 1500 words for an essay or 3 hours for an exam, 15 minutes for a presentation. The tariffs should aim to be commensurate across the department.

Week due – the week in the semester the course work is to be handed in or the exam or test takes place.]

14. Learning Session Structure

[Describe the structure of each weekly learning session, e.g a 1 hour lecture followed by 30 minute tutorial, and 1 1/2 hour practical workshop in a computer lab]

30 minutes Tutorial

2 hour lecture

1 1/2 hour lab session

15. Learning and Teaching Methods

[Describe the range of teaching methods used e.g. lectures, tutorials, workshops,

set readings. Then describe how much time each will take each week and in total for the semester e.g. one hour lecture per week (total 14 hours) and what that teaching method will be used for on the module e.g. the tutorial will consist of a set questions put to the students to informally assess their understanding of the content of the lecture, to allow them to think about and solve example problems related to the lecture content, to express their understanding in English, and to correct any misunderstanding or gaps in their knowledge of the lecture's content.]

30 minutes Tutorial and 11 1/2 hours for two semester.
 2 hour lecture and 46 hours for two semester.
 1 1/2 hour lab session 33 1/2 hours for two semester.

16. Scheme of Work

Week	Delivery Method	Content	Learning Materials	Learning Outcomes	Form of Assessment
1	Lecture, Tutorial	Introduction Evolution of mobile phones Mobile Technologies Short introduction of the iPhone, Android, Windows & Blackberry SDK	Slides, Notes, Exercises	LO2	Formative Assessment
1	Lab		Exercises		
2	Lecture, Tutorial	Mobile system hardware Restricted hardware devices employed in mobile system. i.e. microprocessors, memory technologies, power requirements and saving, security of applications and code, display devices, input devices, etc	Slides, Notes, Exercises	LO2	Formative Assessment
2	Lab		Exercises		
3	Lab		Exercises		

4 & 5	Lecture, Tutorial	Application development under Android An introduction to the Android SDK features Introducing the Application Manifest Using the Manifest Editor The Android Application Life Cycle Understanding Application Priority and Process States Externalizing Resources Introducing the Android Application Class	Slides, Notes, Exercises	LO1, LO2, LO3	Formative Assessment
4 &5	Lab		Exercises		
6	Lecture, Tutorial	Creating User Interfaces Fundamental Android UI Design Introducing Views Introducing Layouts Creating New Views Drawable Resources Resolution and Density Independence Creating and Using Menus	Slides, Notes, Exercises	LO1, LO3	Formative Assessment
6	Lab		Exercises		
7	Lecture, Tutorial	Intents, Broadcast Receivers, Adapters, and the Internet Introducing Intents Introducing Pending Intents Introducing Adapters Using Internet	Slides, Notes, Exercises	LO8, LO5	Formative Assessment

		Resources Introducing Dialogs			
7	Lab		Exercises		
8	Lecture, Tutorial	Files, Saving State, and Preferences Saving Simple Application Data Creating and Saving Preferences Retrieving Shared Preferences Introducing the Preference Activity and Preferences Framework Creating a Standard Preference Activity for the Earthquake Viewer Saving Activity State Saving and Loading Files Including Static Files as Resources File Management Tools	Slides, Notes, Exercises	LO1, LO5, LO8,	Formative Assessment
8	Lab + Class Exam I		Exercises		Summative Assessment
8	CW I	Developing android application		LO1, LO2, LO3, LO8	Summative Assessment
9	Lecture, Tutorial	Database and Content providers Introducing Android databases Introducing SQLite Working with SQLite Creating content provider	Slides, Notes, Exercises	LO1, LO8	Formative Assessment

		Using content provider			
9	Lab		Exercises		
10	Lecture, Tutorial	Maps, Geocoding, and Location-Based Services Using Location-Based Services Selecting a Location Provider Finding Your Location Using Proximity Alerts Using the Geocoder Creating Map-Based Activities	Slides, Notes, Exercises	LO1, LO4, LO8, LO5	Formative Assessment
10	Lab		Exercises		
11	Lecture, Tutorial	Working in the Background Introducing Services Using Background Threads Introducing Notifications Using Alarms	Slides, Notes, Exercises	LO1, LO8	Formative Assessment
11	Lab		Exercises		
12	Lecture, Tutorial	Invading the Phone-Top Introducing Home-Screen Widgets Creating App Widgets Introducing Live Folders Creating Live Wallpaper	Slides, Notes, Exercises	LO1, LO8	Formative Assessment
12	Lab		Exercises		
13	Lecture, Tutorial	Audio, Video, and Using the Camera Playing Audio and Video Recording Audio and Video	Slides, Notes, Exercises	LO1, LO4, LO8	Formative Assessment

		Using the Camera and Taking Pictures Adding New Media to the Media Store Raw Audio Manipulation Speech Recognition			
13	Lab		Exercises		
14 & 15	Lecture, Tutorial	Bluetooth, Networks, and Wi-Fi Using Bluetooth Managing Network Connectivity Managing Your Wi-Fi	Slides, Notes, Exercises	LO1, LO4, LO8	Formative Assessment
14&15	Lab		Exercises		
16	Lecture, Tutorial	Sensors Using Sensors and the Sensor Manager Interpreting Sensor Values Using the Compass, Accelerometer, and Orientation Sensors Controlling Device Vibration	Slides, Notes, Exercises	LO1, LO4, LO8	Formative Assessment
16	Lab + Class Exam II		Exercises		Summative Assessment
16	CW II	Developing android application		LO1, LO2, LO3, LO4, LO5, LO8	Summative Assessment
17	Lecture, Tutorial	Telephony and SMS Telephony Introducing SMS and MMS	Slides, Notes, Exercises	LO1, LO8	Formative Assessment
17	Lab		Exercises		
		Advanced Android	Slides, Notes,	LO1, LO8	Formative Assessment

18 &19	Lecture, Tutorial	Development Android Text to Speech Using Internet Services Animations Creating Interactive controls	Exercises		
18&1 9	Lab		Exercises		
20 &21	Lecture, Tutorial	Hybrid Applications Knowledge on creating hybrid apps and comparison Sencha Touch jQuery mobile Phonegap	Slides, Notes, Exercises	LO1, LO7	Formative Assessment
20&2 1	Lab		Exercises		
22&2 3	Lecture, Tutorial	Future of Mobile Computing	Slides, Notes, Exercises		Formative Assessment
24	Revision				

17. Bibliography

[List of books or articles to be used in the module]

Meier, Reto. *Professional Android 2 Application Development*. Indianapolis, IN: Wiley Pub., 2010. Print.

Darcey, Lauren, and Shane Conder. *Sams Teach Yourself Android Application Development in 24 Hours*. Indianapolis, IN: Sams Pub., 2010. Print.

Burnette, Ed. *Hello, Android: Introducing Google's Mobile Development Platform*. Raleigh, NC: Pragmatic help, 2010. Print.

Android Developers. 2014. *Android Developers*. [ONLINE] Available at: <http://developer.android.com/index.html>. [Accessed 21 September 2014].

18. Authored by

[The member of staff who wrote the modules specification. Usually the module leader, if being delivered for the first time. Include the date it was completed.]

Thenraja Vettivelraj

19. Validated and Verified by

[Another member of staff who has checked the module specification to ensure that it meets the requirements of the course of which it a part and has checked the specification for any errors. This will include the date it was approved.]