MAHARISHI UNIVERSITY OF MANAGEMENT

Mobile Device Programming

Enjoy greater efficiency and accomplish more

CS 473

Professor

Dr. Renuka Mohanraj

April 2018

Maharishi's Eighth Year of Invincibility

Global Raam Raj

Maharishi University of Management is an Equal Opportunity Institution.

CS 473: Mobile Device Programming

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SYLLABUS

"The human brain physiology is the hardware of that cosmic computer, which can create anything through proper programming." -- Maharishi Mahesh Yogi

COURSE OBJECTIVES, ACTIVITIES, AND ASSESSMENTS

Main Objectives of Android

The goal of this course is to teach you how to use Java to develop and control Android applications. Upon completion of this course, you will achieve

- Plan the setup of a computer for Android programming.
- Understand how Android applications work, their lifecycle, manifest, intents and using external resources.
- Develop user input and output interfaces using widgets, structured layouts, Listeners, Views, Menus and Dialogs.
- Adapt Android library classes for data storage and retrieval using shared preferences, files and data bases.
- Generate Multimedia applications with the help of Audio, Video and Camera.
- Develop methods to save state information between app runtimes.
- Create adaptable UIs using fragments.
- Understand how to work with Android built-in Sensors.
- Build your own Android Apps.
- Continued development of higher states of consciousness through regular practice of the Transcendental Meditation technique and a balanced daily routine.
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This is what you'll learn to do	This is how you'll learn it	This is what will show you've learned it
Android Basics: **Discuss** Android architecture, project structure and Activity life cycle. **Discriminate** between the elements of an Android manifest. **Develop** user input and output interfaces using widgets and structured layouts in XML and Java.(3,5)	**By constructing** Android apps that properly demonstrate the activity lifecycle and layouts. **By constructing** Android apps that properly integrate XML for user interfaces.	Results from Quizzes, and the Midterm examination.

Working with Multiple Activities **Design** Android apps using Intents and Fragments. **Build** apps using WebView and HTML. (3,5)	**By constructing** Android apps that properly integrate Intents, fragments and WebView.	Results from Quizzes, and the Midterm examination.
Media Handling **Create** multimedia apps using audio and video. **Devise** ways to incorporate the camera and its data into Android. (3,5)	**By constructing** Android apps that properly integrate the use of Media Player, VideoView, Camera, Audio recording and Video recording.	Results from Quizzes, and the final examination.
Data Handling **Demonstrate** the various ways of storing data using Shared Preferences, Internal, External Storage and SQLite database. (3,5)	**By constructing** Android apps that properly transfer data from Android apps to various data sources.	Results from Quizzes, and the Final examination.
Project **Develop and present** a Mobile app that integrates the knowledge gained from this course. (3,4,5)	**By creating** (as a team) app using Android.	The presentation complements the project documentation and the app demo
Science of Consciousness **Explain** the connection between the Science of Consciousness and Android Programming. (2)	**By writing** appealing points (with a drawing) that have a Science of Consciousness connection.	A short Essay Exam Questions

*The numbers in parentheses refer to the MUM Essential Learning Outcomes that are best supported by this course objective; they appear in **boldface** in the list below. (Highlight in bold those that best apply to your course objectives, activities and assessments)

1. Holistic development of consciousness and health
2. **Consciousness-Based understanding (Knowledge)**
3. **Creative and critical thinking**
4. **Communication**
5. **Scientific and quantitative reasoning**
6. Collaboration and leadership
7. Sustainable local and global citizenship

Course Outline

Week – 1

Lesson – 1 – Introduction to Android

- What is Android?
- Android Architecture
- Android Features
- Android Releases
- Android Components

Lesson – 2 – Creating First App

- Introduction to Android Studio
- Creation of HelloWorld app
- Android Project Structure and Folders
- Styles and Themes

Lesson – 3 Layouts, Activity and UI Components

- Activity life cycle
- Linear, Relative and other layouts
- Basic Components
- Events Handling
- Hands on Example – Simple Calculator

Lesson – 4 Intents

- Implicit Intents
- Explicit Intents
- Hands on Example
    - Explicit Event - Send a message from one activity to another activity.
    - Implicit Event – Sending message through E-Mail, Dial up screen and WhatApp
- Run apps on real device
- Getting result from the activity

Lesson – 5 Advanced UI Components – 3 days

- Auto Complete View
- Spinner
- List View

- Adapters
    - Array Adapter
    - Custom Adapter
- Android Menus, Action Bar
- Dialogs
- Notifications
- Hands on Example

Week - 2

Lesson-6

- Fragments
- Shared Preferences
- Hands on Example
    - Fragments – Single screen with Three Fragments
    - Shared Preference – Working with Login

Lesson-7 WebView and HTML

- Introduction
- WebView Operations
- Hands on Example
- Methods in WebViewClient class
- How create your own HTML Page
- Hands on Example

Lesson – 8 - Multimedia in Android – 2 Days

- Media Player
- Video View
- Audio Recording
- Video Recording
- Camera & Gallery
- Hands on Example

Week - 3

Lesson – 9 - SQLite Database & JSON [2 days]

- Introducing SQLite
- SQLite Open Helper
- SQLite CRUD operations
- How to execute native SQL Queries
- Android Device Monitor[ADM]
- SQLite browser

- Hands on Example
- Introduction to JSON

Lesson – 10 – Sensors

- Sensors Overview
- Sensor Manager
- Types of sensors
- Sensor Event
- Hands on example

Lesson – 11 – Localization

- Supporting different languages
- Localization Checklist
- Localizing with Resources

Lesson – 12- Publish APK

- Build signed .apk
- Build unsigned .apk
- Play store publish process
- Play store .apk updating process

Lesson – 13 – Kotlin Introduction

- What is Kotlin?
- Kotlin Features
- main function
- Mutable and Immutable
- Kotlin Strings
- Looping
- Null safety
- Class and Objects

Lesson – 14 – App Demo

- AndroidCourse App

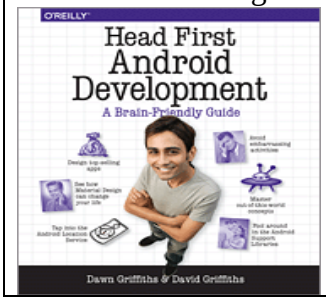
Week – 4 Project

Online Reading Resource

https://developer.android.com

Textbooks

The *recommended* textbook for the course is

1. Head First Android Development A Brain-Friendly Guide, Second Edition By Dawn Griffiths, David Griffiths **Publisher:** O'Reilly Media **Release Date:** August 2017 	2. Android Programming: The Big Nerd Ranch Guide (3rd Edition) (Big Nerd Ranch Guides) 

OFFICE HOURS, CONTACT INFORMATION AND BIOGRAPHICAL SKETCH

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RECOMMENDED DAILY SCHEDULE

Class is in session from 10 AM to 12:15 every weekday morning, with the final 10 minutes devoted to a group meditation, and from 1:15 to 3:05 every afternoon, with the final 20 minutes for group meditation. On Saturday, we meet only in the morning and follow the usual weekday format during the morning.

Course Resources : www.online.cs.mum.edu => Choose **CS473-2018-4A-4D(REN)**

Reading and Lab Assignments

The purpose of all labs, projects, and homework is to provide an opportunity for learning with a minimum pressure for graded outcomes. For the purpose of learning, you should attempt the assigned project individually. Discussions among fellow students are very

beneficial to the learning process in order to clarify your understanding and to remove any road blocks that may slow down progress.

Every day you have homework to apply the knowledge you gained on that day. Homework will be submitted by the next day 10 pm.

All required reading is located online on the Sakai site. You are also encouraged to read additional information beyond that designated in class from the http://developer.android.com website.

Homework Submission

We will be using GitHub.com to upload your assignments for this class. GitHub is also awesome for showing off your own coding projects and skills. Because the free GitHub account does not allow you to create private repositories once you get a grade for an assignment you can delete the repository for that assignment, otherwise if you want to keep the repository it is ok. Just realize that the whole world can see it and eventually someone will come across it.

1) If you already have a GitHub account then you are probably already familiar with repositories and using Git.

2) If you do not have a GitHub account you can create a free one by going to https://github.com/ and signing up for a free account.

3) Learn how to use GitHub for Android studio by referring internet resources.

Project

You will be asked during the middle of second week of class to come up with an idea for an Android app. Projects will be assigned as group of two members. You have the freedom to choose the topics in the given area. Decide what kind of app you will create, if you are ok with the idea inform to the Faculty. **No two groups may have the same idea for an app.**

Each day you should incorporate the concepts you learn on that day into your app. If you wish to change the idea for your app, ask the faculty for approval before changing to a different app.

During this course you will give a presentation that demonstrates the final version of your app. Presentations will occur the last day of the fourth week. Giving presentations will hone your skills for doing interviews and showing your work. You will have some reviews in the third week to check your progress.

You should develop a Mobile Application in the following areas

1. Marketing/ Promoting MUM Compro department worldwide
2. Develop some useful app to the benefit of
    a. Compro Current & Alumni Student
    b. Compro Faculty
    c. Compro Department
3. Useful app to the benefit of Society

Second week Monday: Need to provide a title in the mentioned area

Third Week Thursday: Review 1

Fourth Week Thursday: Final Presentation

Project Duration: Third week all afternoon session
Fourth week Monday, Tuesday and Wednesday.

Evaluation Criteria

- Professional etiquette:5% [Includes Dress code, class participation, group meditation[Dalby & class room], interaction, punctuality etc.,]
- Quizzes: 5%
- Assignments 15%
- Exams[Midterm & Final] : 40%
- Final Project: 35%

Attendance at all class sessions including labs is required. Unexcused absences or tardiness will reduce a student's final grade. If you are sick and must miss a class send email to rmohanraj@mum.edu before class.

Academic Honesty

If you get caught cheating on the midterm or final, you will receive a 0 for that exam. "Cheating" means (1) getting answers from someone else, or (2) giving answers to someone else.

Course Policy Link

Dress Code :

http://portals.mum.edu/Customized/Uploads/ByDate/2012/December_2012/December_14th_2012/MUM%20Student%20Dress%20Code69610.pdf

Punctuality & Attendance

http://portals.mum.edu/RelId/620772/ISvars/default/Punctuality_and_Attendance.htm

Campus Services

http://portals.mum.edu/RelId/664812/ISvars/default/Campus_Services_Links.htm

Academic Calendar

http://portals.mum.edu/RelId/690805/ISvars/default/Academic_Calendar_2015%E2%80%932016.htm