



# Namal College, Mianwali

An Associate College of the University of Bradford, UK



**Module Title:** Mobile Application Development

**Offered to:** BSc (CS)

**Module Code:** COS7025-B

**Module Type:** Standard (Elective)

**Instructor:** Muhammad Sarmad Ali, Muhammad Jaleed

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**Stage/Level:** 3/7

**Semester:** 1 (Fall 2018)

<b>Module Description</b>	The module is an elective (masters level course at UoB), and the title is self-explanatory. Besides theory, the focus shall be on hands-on development. After an initial overview of app development technologies, native Android development will be the target throughout the module. The tentative module contents are listed below. Further details can be found at University of Bradford <a href="#">link</a> .
<b>Aims &amp; Objectives</b>	To provide a co-ordinated and consistent coverage of theory, design and development to create and deliver contents on mobile devices such as smart phones and tablets etc.
<b>Pre-requisite</b>	<ul style="list-style-type: none"><li>To get most out of this module, you must be having:<ul style="list-style-type: none"><li>Very good foundations in Java programming, plus understanding of multithreading concepts</li><li>Basic understanding of XML</li><li>A keen eye, critically observing and analyzing designs of common Android apps you use on daily basis</li></ul></li></ul>
<b>Textbooks</b>	UoB has designated following book as a textbook: <ul style="list-style-type: none"><li><i>Android Programming: The Big Nerd Ranch Guide</i>, by Bill Phillips, Chris Stewart, Brian Hardy and Kristin Marsicano</li></ul> In our offering, however, besides above text, we'll mostly resort to: <ul style="list-style-type: none"><li><i>Android API Guide</i>: <a href="https://developer.android.com/guide/index.html">https://developer.android.com/guide/index.html</a></li><li><i>Android Training</i>: <a href="https://developer.android.com/training/index.html">https://developer.android.com/training/index.html</a></li></ul>
<b>References</b>	<ul style="list-style-type: none"><li><i>The Busy Coder's Guide to Android Development (version 8.13)</i> by Mark L. Murphy</li><li><i>Android 6 for Programmers: An App Driven Approach</i> by Paul J. Deitel, Harvey M. Deitel</li><li><i>Android Development Patterns: Best Practices for Professional Developers</i> by Phil Duston</li><li><i>Material Design Guidelines</i>: <a href="https://material.io/guideline/">https://material.io/guideline/</a></li></ul>
<b>Programming Environment</b>	<ul style="list-style-type: none"><li>IDEs: Android Studio</li><li>Frameworks/APIs: Android SDK</li><li>Platforms: JVM, Windows, Linux</li></ul>
<b>Assessment Tools</b>	<ul style="list-style-type: none"><li>Summative:<ul style="list-style-type: none"><li>Coursework (Project) – 100%</li></ul></li></ul>

## **Tentative Delivery Schedule**

<b>Week</b>	<b><i>Lecture distribution</i></b>	<b><i>Lab distribution</i></b>
1	<ul style="list-style-type: none"> <li>- Introduction and challenges of software development for mobile devices</li> <li>- Mobile application development landscape: Native, Hybrid, Web apps</li> </ul>	<ul style="list-style-type: none"> <li>- Installation, emulator setup, troubleshooting</li> <li>- First basic app</li> <li>- <b>Project Assignment</b></li> </ul>
2	<ul style="list-style-type: none"> <li>- Overview of Android platform; Building blocks of Android application</li> <li>- Introduction to Activities, Activity lifecycle</li> <li>- Introduction to Intents</li> </ul>	<ul style="list-style-type: none"> <li>- Building with Gradle</li> <li>- Brief intro to XML,</li> <li>- Manifest, Resources,</li> <li>- Apps with basic Views</li> </ul>
3	<ul style="list-style-type: none"> <li>- More on Intents: explicit/implicit intents, intent filters</li> <li>- Developing UI in Android: basic Views and Layouts</li> </ul>	<ul style="list-style-type: none"> <li>- Apps with multiple Activities</li> <li>- Use of different views and layouts</li> <li>- <b>Finalize App ideas/proposals</b></li> </ul>
4	<ul style="list-style-type: none"> <li>- More on Views and Layouts; Constraint layout</li> <li>- Material design guidelines</li> </ul>	<ul style="list-style-type: none"> <li>- Apps with multiple Activities</li> <li>- Basic debugging, using LogCat</li> </ul>
5	<ul style="list-style-type: none"> <li>- Introduction to Fragments; Dialogs and Dialog Fragments</li> <li>- Testing Android Apps; introduction to local/instrumented testing</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Supporting multiple screens</b></li> <li>- <b>Due: Proposal + UI Mockups</b></li> </ul>
6, 7	<ul style="list-style-type: none"> <li>- Data storage: Internal vs. external storage</li> <li>- Shared preferences, database APIs (using SQLite)</li> <li>- Using Room Persistence Library</li> </ul>	<ul style="list-style-type: none"> <li>- Relevant exercises</li> </ul>
8	<ul style="list-style-type: none"> <li>- Lists and Adapters</li> <li>- More on Testing: UI testing with Espresso</li> </ul>	<ul style="list-style-type: none"> <li>- Relevant exercises</li> </ul>
9, 10	<ul style="list-style-type: none"> <li>- Basics of Android Concurrency; using AsyncTask</li> <li>- Network access and consuming web data; using WebView</li> <li>- More on Android Concurrency; using Loopers and Handlers</li> </ul>	<ul style="list-style-type: none"> <li>- Relevant exercises</li> <li>- <b>Progress presentation</b></li> </ul>
11	<ul style="list-style-type: none"> <li>- Location based services; using Google Maps APIs</li> <li>- Using backend cloud services; introduction to Firebase</li> </ul>	<ul style="list-style-type: none"> <li>- Relevant exercises</li> </ul>
12, 13	<ul style="list-style-type: none"> <li>- Broadcast Receivers</li> <li>- Defining background services; using IntentService</li> <li>- Basic Animations; property/view animations</li> <li>- <b>Introduction to Android Sensor Framework*</b></li> <li>- <b>Android Animations*</b></li> </ul>	<ul style="list-style-type: none"> <li>- Relevant exercises</li> <li>- <b>Project Submission</b></li> </ul>
14, 15	<ul style="list-style-type: none"> <li>- <b>Project demo and final presentations</b></li> </ul>	

\* May be skipped