



**COLLEGE OF INFORMATION TECHNOLOGY  
DEPARTMENT OF INFORMATION TECHNOLOGY**

**COURSE SYLLABUS/SPECIFICATION**

**CODE & TITLE:** ITCS 452 – Advanced Mobile Computing  
**WEIGHT:** (2 - 2 - 3)  
**PREREQUISITE:** ITCS 427

**NQF Level Allocated:** 8

**NQF Notional Hours / Credits:** 120 notional hours/ 12 NQF credit

**DESCRIPTION:** This course will provide students with both broad and in-depth knowledge, and a critical understanding of up-to-date mobile computing from different viewpoints: infrastructures, principles and theories, technologies, and applications in different domains. In addition, this course emphasizes concepts pertains to Mobile Adhoc Network and Wireless Sensor Network and different applications based on routing protocols. The course will provide an advanced in-depth overview of the mobile computing subject area, including the latest research. This course aims at the discovery of comprehensive and important current issues in mobile computing and communications.

**OBJECTIVES:**

1. To master the current trends of mobile computing technologies.
2. To illustrate current and up-to-date architectures and protocols in Mobile computing.
3. To evaluate critical design tradeoffs associated with different mobile technologies, architectures, interfaces, and business models.
4. To exemplify the impact of usability, security, privacy and commercial viability of different mobile technologies.
5. To enhance the different applications that mobile computing offers to people, employees, and businesses.
6. To critically describe the possible future of advanced mobile computing technologies and applications.

**SEMESTER:**

**ACADEMIC YEAR:**

**INSTRUCTOR:**

**OFFICE TEL:**

## INTENDED LEARNING OUTCOMES (ILOs)

Upon successful completion of the course, students should be able to:

A. Knowledge and Understanding		NQF Descriptor/Level
A1	<u>Concepts and Theories:</u> Demonstrate <i>critical knowledge and understanding for concepts of mobile computing.</i>	Knowledge: theoretical understanding [Level 8]
A2	<u>Contemporary Trends, Problems and Research:</u> <i>Demonstrate detailed knowledge and understanding of specialist computing issues emerging mobile computing technologies.</i>	Knowledge: theoretical understanding [Level 8]
A3	<u>Professional Responsibility:</u> NA	

B. Subject-Specific Skills		NQF Descriptor/Level
B1	<u>Problem Solving:</u> <i>Use specialist level of up-to-date advanced mobile computing problems and solve them.</i>	Knowledge: Practical Application [Level 8]
B2	<u>Modeling and Design:</u> <i>Plan and undertake projects to design advanced and up-to-date mobile applications</i>	Knowledge: Practical Application [Level 8]
B3	<u>Application of Methods and Tools:</u> <i>Demonstrate creativity application of advanced specialized and up-to-date mobile programming tools while developing mobile application.</i>	Knowledge: Practical Application [Level 8] Skills: Communication, ICT & Numeracy [Level 8]

C. Thinking Skills		NQF Descriptor/Level
C1	<u>Analytic:</u> <i>Critically analyze the performance of the developed and most successful mobile applications.</i>	Generic Problem Solving & Analytical skills [Level 8]
C2	<u>Synthetic:</u> <i>Demonstrate insight in integrating components of an application.</i>	Generic Problem Solving & Analytical skills [Level 8]
C3	<u>Creative Thinking and innovation:</u> <i>Identify and Implement solutions for problems related to current mobile computing through investigation of different protocols, tools, and technologies.</i>	Generic Problem Solving & Analytical skills [Level 8]

D. General and Transferable Skills (Other Skills Relevant to Employability and Personal)		NQF Descriptor/Level
D1	<u>Communication</u> : Use Specialist skills to communicate complex information and ideas in appropriate oral and written forms.	Communication, ICT and Numeracy Skills [Level 7]
D2	<u>Teamwork and Leadership</u> : Operate Specialist skills to work effectively as a member/leader of a team who may plan, design, and implement a mobile application.	Competence: Autonomy, Responsibility and Context [Level 8]
D3	<u>Organizational and Developmental Skills</u> : Demonstrate ability to lead projects and organize ideas and effectively allocate time in given assignments.	Competence: Autonomy, Responsibility and Context [Level 8]
D4	<u>Ethical and Social Responsibility</u> : NA	

Course Structure (Outline)						
Week	Hours		ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
	Lec.	Lab				
1	2	2	A1	<b>Mobile Computing- An Overview:</b> <ul style="list-style-type: none"> <li>Motivations, Concepts, Challenges, and Applications Of Mobile Computing.</li> <li>Introduction to mobile development, and SPA</li> <li>Overview of iOS and Android operating system.</li> <li>Types of mobile apps (Native, Web, Hybrid)</li> </ul>	Lecture	
2	2	2	A1	<ul style="list-style-type: none"> <li>Describe Mobile Foundation components and architecture</li> <li>Integrate with data sources</li> <li>Understand and be able to differentiate the different types of client-side development enabled by Mobile Foundation</li> </ul>	Lecture	Oral Participation*

3	2	2	A1	<ul style="list-style-type: none"> <li>• Configure and use the CLI</li> <li>• Manage the server profile</li> <li>• Create and manage apps</li> <li>• Create and manage adaptors</li> </ul>	Lecture	Oral Participation*
4	2	2	A1	<ul style="list-style-type: none"> <li>• Add the Mobile Foundation SDK to an application</li> <li>• Connect to the Mobile Foundation Server</li> <li>• Customize the startup process</li> <li>• Use WL resources requests to connect to server side resources</li> <li>• Debug an application</li> </ul>	Lecture	Oral Participation*
5	2	2	A1	<ul style="list-style-type: none"> <li>• Add the Mobile Foundation SDK to an application</li> <li>• Connect to the Mobile Foundation Server</li> <li>• Customize the startup process</li> <li>• Use WL resources requests to connect to server side resources</li> <li>• Debug an application</li> </ul>	Lecture	Oral Participation*
6	2	2	A1, B3	<ul style="list-style-type: none"> <li>• Create Mobile Foundation adaptors</li> <li>• Test adaptors using the OpenAPI Specification</li> <li>• Invoke Java code from adaptors</li> </ul>	Lecture/ In-Lab Supervised Work	Oral Participation*

7	2	2	A1	<ul style="list-style-type: none"> <li>• Invoke adapters from other adapters</li> <li>• Use Mobile First server side APIs</li> </ul>	Lecture	Oral Participation*
8	2	2	A1, B1, B2, B3	<ul style="list-style-type: none"> <li>• Configure Push notifications</li> <li>• Implement and test Push and SMS Notification mechanisms</li> </ul>	Lecture/ In-Lab Supervised Work	In-Lab Exercises*/ Oral Participation*
9	2	2	A1, B1, B2, B3	<ul style="list-style-type: none"> <li>• Describe the OAuth 2.0 based Mobile Foundation security framework</li> <li>• Manage device enrollment</li> <li>• Create predefined security checks</li> <li>• Create custom security checks</li> </ul>	Lecture/ In-Lab Supervised Work	In-Lab Exercises*/
10	2	2	A1, B1, B2, B3, C1	<ul style="list-style-type: none"> <li>• Describe the OAuth 2.0 based Mobile Foundation security framework</li> <li>• Manage device enrollment</li> </ul>	Lecture/ In-Lab Supervised Work	In-Lab Exercises*/ Oral Participation*/ <b>Major Test</b>
11	2	2	A1, A2, B1, B2, B3, D1, D3	<ul style="list-style-type: none"> <li>• Create predefined security checks</li> <li>• Create custom security checks</li> </ul>	Lecture/ In-Lab Supervised Work/ Independent Learning	In-Lab Exercises*/ Oral Participation*/ <b>Assignment 1</b>
12	2	2	A1, B1, B2, B3, C1, C2, C3	<ul style="list-style-type: none"> <li>• Build and deploy applications and adapters to multiple environments</li> <li>• Configure Mobile Foundation Server settings</li> </ul>	Lecture/ In-Lab Supervised Work	<b>Lab Project1</b> Oral Participation*

13	2	2	A1, B1, B2, B3, C1, C2, C3	<ul style="list-style-type: none"> <li>• Configure and deploy adapters</li> <li>• Migrating from earlier releases</li> </ul>	Lecture/ In-Lab Supervised Work	<b>Lab Project2</b>
14	2	2	A1, A2, B1, B2, B3, D1, D3	<ul style="list-style-type: none"> <li>• Understand the capabilities provided by Mobile Foundation Operational Analytics</li> <li>• Enable access to raw and analytic reporting</li> <li>• Use the Analytics REST API</li> <li>• Access client-side crash logs</li> <li>• Use MobileFirst Analytics to capture custom user analytics</li> </ul>	Lecture/ In-Lab Supervised Work/ Independent Learning	<b>Assignment 2</b> (Literature Review)
15	2	2	A2, B1, B2, B3, C1, C2, C3, D1, D2, D3	Student Projects	Project Supervision	Evaluation of Project Presentations and Reports
16	2	-	A1, A2, B1, B2, C1	All Topics		Final Exam

**TEACHING MATERIALS:**

<b>TEXTBOOK(S):</b>	C1000-003 IBM Mobile Foundation v8.0 Application Development Online Certification Video Learning Success Bundle. Esoftcert, PTNR01A998WXY; 1st edition (July 7, 2019)
<b>HANDOUT(S):</b>	PowerPoint slides available on Moodle i.e. <a href="http://www.ahlia.edu.bh/moodle">http://www.ahlia.edu.bh/moodle</a>

<b>REFERENCE(S):</b>	<p>1- Cory Beard, William Stallings (2015). Wireless Communications Networks and Systems Global Edition, Pearson Higher Ed. ISBN: 9781292108711</p> <p>2- Herve Franceschi (2017). Android App Development, Jones &amp; Bartlett Learning. ISBN: 978-1284092127</p> <p>3- Trish Cornez, Richard Cornez (2015). Android Programming Concepts, Jones &amp; Bartlett Learning. ISBN: 978-1284070705.</p> <p>4- Kyle Mew (2017). Android Design Patterns and Best Practices, Packt Publishing. ISBN: 978-1786467218.</p> <p>5- Clifton I. G. (2015) Android User Interface Design: Implementing Material Design for developers, 2nd Edition Addison-Wesley Professional. ISBN:</p>
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**ASSESSMENTS:**

<b>Method of Assessment</b>	<b>Description</b>	<b>Learning Outcomes</b>	<b>Weighting</b>
Oral Participation	Students will be questioned orally to demonstrate their understanding and knowledge of the topics covered during class lectures and lab sessions.	A1	Formative
In-Lab Exercises	Each of the lab exercises consists of a set of practical tasks to be implemented by students individually in class as shown in the above weekly structure. Students work will be observed and directly during the lab sessions.	B3	Formative
Assignments	Two assignments for Literature review. Average will be taken.	A2, D1, D3	15%
Lab Projects	Students will be asked to use and apply appropriate development tools to develop and manipulate specific mobile applications. Students has to code, test and deploy interactive mobile applications with more emphasizes on the use of creative efficient modern User Interfaces, communication, telephony, graphics and multimedia components.	B1, B2, B3, C1, C2, C3	10%
Major Test	The test will be an in-class 90 minutes exam that will consist of short-answer, essay, and	A1, B1, B2, C1	20%

	problem solving questions and cover the topics studied in the first 8 weeks.		
Project	Each group of 2-4 students has to develop a mobile application for solving a real world problem. Each group has to go through all phases of system development cycle, and submit a report and present the work in the class.	A2, B1, B2, B3, C1, C2, C3, D1, D2, D3	15%
Final Exam	The final exam is comprehensive and will be of two hours duration. It will consist of short-answer, analysis, essay, and problem-solving questions.	A1, B1, B2, C1	40%
<b>Overall:</b>			<b>100 %</b>

<b>14. Admissions</b>	
Pre-requisites	ITCS 427
Minimum number of students	8
Maximum number of students	20



