



**COLLEGE OF INFORMATION TECHNOLOGY  
DEPARTMENT OF INFORMATION TECHNOLOGY  
COURSE SYLLABUS/ SPECIFICATION**

**Course Code & Title:** ITCS 427 – Mobile Computing  
**Weight:** (2-2-3)  
**Prerequisite:** ITCS 221 & ECTE 329  
**NQF Level Allocated:** 8

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

**Description:** This course is to cover the concepts and technologies of mobile computing such as 2G/3G/4G networks, and mobile applications development. It imparts knowledge of mobile communication architectures and related communication protocols in addition to location management and messaging. The course also covers the mobile applications development tools and techniques needed to create efficient and effective mobile applications.

**Objective:**

1. To critically understand the concepts, specialist theories, and technologies of mobile computing.
2. To cover both theoretical and practical issues of mobile computing.
3. To develop advanced skills for developing mobile computing applications utilizing specialized mobile programming tools.

**Semester:**

**Instructor (s):**

**Office Telephone:**

**Email (s):**

**Intended Learning Outcomes (ILOs):**

<b>A. Knowledge and Understanding</b>		<b>NQF Descriptor/ Level</b>
<b>A1</b>	<b>Concepts and Theories:</b> Demonstrate critical knowledge and understanding of the mobile computing technologies and applications.	Knowledge: theoretical understanding [Level 8]
<b>A2</b>	<b>Contemporary Trends, Problems and Research:</b> Recognize the current computing issues and research on emerging mobile computing technologies.	Knowledge: theoretical understanding [Level 8]
<b>A3</b>	<b>Professional Responsibility:</b> NA	

<b>B. Subject-specific Skills</b>		<b>NQF Descriptor/ Level</b>
<b>B1</b>	<b>Problem Solving:</b> Critically identify and analyze mobile computing and real world problems and choose/develop appropriate techniques and applications to solve these problems.	Knowledge: Practical Application [Level 8] Skills: Communication, ICT & Numeracy [Level 8]
<b>B2</b>	<b>Modeling and Design:</b> Design mobile applications, including programs, data, and user interface that meet user requirements.	Knowledge: Practical Application [Level 8]
<b>B3</b>	<b>Application of Methods and Tools:</b> Apply advanced specialized mobile programming tools to develop mobile applications.	Knowledge: Practical Application [Level 8] Skills: Communication, ICT & Numeracy [Level 8]

<b>C. Critical-Thinking Skills</b>		<b>NQF Descriptor/ Level</b>
<b>C1</b>	<b>Analytic skills:</b> Critically analyze the performance of the developed mobile applications.	Generic Problem Solving & Analytical skills [Level 8]
<b>C2</b>	<b>Synthetic:</b> Integrate components of an application such as Database into one complete mobile application.	Generic Problem Solving & Analytical skills

		[Level 8]
<b>C3</b>	<b>Creative Thinking and innovation:</b> Demonstrate ability to propose solutions for problems related to mobile computing through investigation of different protocols, tools, and technologies.	Generic Problem Solving & Analytical skills [Level 8]

<b>D. General and Transferable Skills (other skills relevant to employability and personal development)</b>		<b>NQF Descriptor/ Level</b>
<b>D1</b>	<b>Communication:</b> Show ability to communicate clearly to convey complex information and ideas in appropriate oral and written forms.	Communication, ICT and Numeracy Skills [Level 8]
<b>D2</b>	<b>Teamwork and Leadership:</b> 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]
<b>D3</b>	<b>Organizational and Developmental Skills:</b> Demonstrate ability to organize ideas and effectively allocate time in given assignments.	Competence: Autonomy, Responsibility and Context [Level 8]
<b>D4</b>	<b>Ethics and Social Responsibility:</b> NA	

### Course Structure (Outline)

<b>Course Structure (Outline)</b>						
<b>Week</b>	<b>Hours</b>		<b>ILOs</b>	<b>Unit/Module or Topic Title</b>	<b>Teaching Method</b>	<b>Assessment Method</b>
	<b>Lec.</b>	<b>Lab</b>				
1	2	2	A1,B3	<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/ Lab Demonstration	

				<b>Lab:</b> <ul style="list-style-type: none"> <li>Introduction to JavaScript programming.</li> </ul>		
2	2	2	A1	<b>Distributed Systems</b>	Lecture	Oral Participation
3	2	2	A1	<b>Pervasive Computing</b>	Lecture	Oral Participation
4	2	2	A1	<b>Mobile communications:</b> <ul style="list-style-type: none"> <li>Wireless Transmission,</li> <li>Cell Design And Area Planning For Cellular Networks. Frequency Reuses And Channel Designs.</li> </ul>	Lecture	Oral Participation
5	2	2	A1	<b>Cellular Network And Architectures:</b> <ul style="list-style-type: none"> <li>GSM And Other 2G, 3G and 4G Networks.</li> </ul>	Lecture	Oral Participation
6	2	2	A1, B1, B2, B3	<b>Introduction to Visual Studio Code, Git, NodeJS</b>	Lecture/ In-Lab Supervised Work	Oral Participation
7	2	2	A1	<b>Hybrid App Mobile Development</b>	Lecture	Oral Participation
8	2	2	A1, B3	<b>Version Control Systems: Git</b>	Lecture/ In-Lab Supervised Work	In-Lab Exercises/ Oral Participation
9	2	2	A1, B3	<b>NodeJS</b>	Lecture/ In-Lab Supervised Work	In-Lab Exercises/
10	2	2	A1, B1, B2, B3, C1	<b>IONIC</b> <b>Lab:</b> <ul style="list-style-type: none"> <li>Create first hybrid mobile app</li> <li>Running Ionic app using android Studio</li> </ul>	Lecture/ In-Lab Supervised Work	In-Lab Exercises/ Oral Participation / Major Test
11	2	2	A1, A2, B1,	<b>Know the different templates of IONIC</b> <b>Lab:</b>	Lecture/ In-Lab Supervised Work/ Independent	In-Lab Exercises/ Oral

			B2, B3, D1, D3	<ul style="list-style-type: none"> <li>Build 3 different hybrid mobile app using the different ionic templates</li> </ul>	Learning	Participation / Assignment 1
12	2	2	A1, B1, B2, B3, C1, C2, C3	<b>Ionic Creator</b> <b>Lab:</b> <ul style="list-style-type: none"> <li>Creating a project using Ionic Creator</li> <li>Importing a project into ionic</li> </ul>	Lecture/ In-Lab Supervised Work	Lab Project1
13	2	2	A1, B1, B2, B3, C1, C2, C3	<b>Ionic Lists and Ionic Inputs</b> <b>Lab:</b> <ul style="list-style-type: none"> <li>Creating a project using the different types of Ionic Lists and Ionic Inputs</li> </ul>	Lecture/ In-Lab Supervised Work	Lab Project2
14	2	2	A1, A2, B1, B2, B3, D1, D3	<b>Ionic Tabs and Ionic Form Validation</b> <b>Lab:</b> <ul style="list-style-type: none"> <li>Creating a project using the different types of Ionic Tabs and Ionic Form Validation</li> </ul>	Lecture/ In-Lab Supervised Work/ Independent Learning	In-Lab Exercises/ Assignment 2 (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

\* Formative assessment

## Teaching Materials:

<b>Textbook(s):</b>	<ol style="list-style-type: none"> <li>1- Rahat Khanna, Sani Yusuf, Hoc Phan (2017). <i>Ionic: Hybrid Mobile App Development</i>, Packt Publishing. ISBN: 978-1788293112.</li> <li>2- Victor Savkin, Jeff Cross (2017). <i>Essential Angular 4</i>, Packt Publishing. ISBN: 978-1788293761</li> </ol>
<b>Handout(s):</b>	Available on <a href="http://www.ahlia.edu.bh/moodle">http://www.ahlia.edu.bh/moodle</a> .
<b>Reference(s):</b>	<ol style="list-style-type: none"> <li>1- Cory Beard, William Stallings (2015). <i>Wireless Communications Networks and Systems</i> Global Edition, Pearson Higher Ed. ISBN: 9781292108711</li> <li>2- Herve Franceschi (2017). <i>Android App Development</i>, Jones &amp; Bartlett Learning. ISBN: 978-1284092127</li> <li>3- Trish Cornez, Richard Cornez (2015). <i>Android Programming Concepts</i>, Jones &amp; Bartlett Learning. ISBN: 978-1284070705.</li> <li>4- Kyle Mew (2017). <i>Android Design Patterns and Best Practices</i>, Packt Publishing. ISBN: 978-1786467218.</li> <li>5- Clifton I. G. (2015) <i>Android User Interface Design: Implementing Material Design for developers</i>, 2<sup>nd</sup> Edition Addison-Wesley Professional. ISBN: 978-0134191409</li> </ol> <p><b>Websites</b>            Google, Android Developer Resources:  <a href="https://developer.android.com/index.html">https://developer.android.com/index.html</a>            AngularJS by Google  <a href="https://angularjs.org/">https://angularjs.org/</a>            Ionic Framework Doc  <a href="http://ionicframework.com/">http://ionicframework.com/</a></p>

## Assessment

Method of Assessment	Description	Learning Outcomes	Weighting
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	B1, B2, B3, C1, C2, C3	10%

	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.		
Major Test	The test will be an in-class 90 minutes exam that will consist of short-answer, essay, and problem solving questions and cover the topics studied in the first 8 weeks.	A1, B1, B2, C1	20%
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, A2, B1, B2, C1	40%
<b>Overall:</b>			<b>100 %</b>

<b>Admissions</b>	
<b>Minimum number of students</b>	<b>5</b>
<b>Maximum number of students</b>	<b>20</b>

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