



# Engineering Program

<b>Specialization</b>	<b>Smart Device Engineering</b>
<b>Course Number</b>	<b>20412241</b>
<b>Course Title</b>	<b>Smart Devices and Wireless Networks</b>
<b>Credit Hours</b>	<b>3</b>
<b>Theoretical Hours</b>	<b>3</b>
<b>Practical Hours</b>	<b>0</b>

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وصف المادة الدراسية:

- ❖ History of cellular mobile communication – Important terminologies – Mobile computing Environment – Architecture of mobile computing – Functions of mobile computing – Mobile and wireless devices.

أهداف المادة الدراسية:

This course focuses on Wireless communication is the transfer of information over a distance without the use of electrical conductors or "wires". The distances involved may be short (a few meters as in television remote control) or very long (thousands or even millions of kilometers for radio communications). When the context is clear the term is often simply shortened to "wireless". Wireless communications is generally considered to be a branch of telecommunications.

Wireless is a term used to describe telecommunications in which electromagnetic waves (rather than some form of wire) carry the signal over part or the entire communication path.

**Example:**

Cellular phones and pagers: provide connectivity for portable and mobile applications, both personal and business.

Global Positioning System (GPS): allows drivers of cars and trucks, captains of boats and ships, and pilots of aircraft to ascertain their location anywhere on earth.

الوصف العام:

رقم الوحدة	اسم الوحدة	محتويات الوحدة	الزمن
1.	Mobile phones development history	Mobile phones development history (CB radio phones, talkie Walkie, cellular phones, MTSO, Mobile codes (ESN, MIN, SID))	2 week
2.	Mobile Generations	Mobile Generations (1G, 2G, 3G)	1 week
3.	Mobile (PCB) Printed Circuit Board	Mobile (PCB) Printed Circuit Board (Antenna point, Antenna switch, PFO, Network IC, Power IC, CPU, Flash IC, Logic IC, Charging IC, Audio IC)	3 week
4.	Multiple Access Techniques	Multiple Access Techniques FDMA - TDMA – CDMA – features – comparison of, FDMA, TDMA and CDMA techniques.	2 Week
5.	Mobile Modes	<ul style="list-style-type: none"> <li>▪ Mobile Modes (Multiple Band ( Dual band, Quad Band), Multiple Mode (Dual Mode, Tri Mode)</li> </ul> Mobile Data Symbols ( E, H, G, LTE, H+, 3G, 4G,)	1 week
6.	Mobile Cellular Networks	<ul style="list-style-type: none"> <li>▪ Mobile Cellular Networks (BTS, GSM, GSM Services, GSM channels, GSM Frequencies, GSM Network components, Antennas types)</li> </ul>	2 week
7.	Mobile IP	Mobile IP <ul style="list-style-type: none"> <li>• Mobile IP Functional Entities</li> <li>• Mobile IP topology</li> </ul>	1week

		<ul style="list-style-type: none"> <li>• Mobile IP v 4.0</li> <li>• How Mobile IP Works             <ul style="list-style-type: none"> <li>• Mobility Agents</li> <li>• Care-of Addresses</li> <li>• Agent Discovery</li> </ul> </li> <li>• Mobile IP Registration process             <ul style="list-style-type: none"> <li>• Mobile IP with Reverse Tunneling</li> </ul> </li> <li>• Routing Datagrams to and From Mobile Nodes             <ul style="list-style-type: none"> <li>• Private Addresses</li> </ul> </li> </ul>	
8	Mobile TCP	<ul style="list-style-type: none"> <li>▪ Mobile TCP (Traditional TCP -TCP Congestion control – Flow control ARQ Automatic repeat Request (Stop and Wait, Go Back N, Selective reject) , TCP problems with wireless, handoff procedure)</li> </ul>	1 week
9	Introduction to wireless Networks Basics	<ul style="list-style-type: none"> <li>▪ Introduction to wireless Networks Basics (Why Wireless, features, Disadvantages, Single Frequency Radio, Spread Spectrum, InfraRed)</li> </ul>	1 week
10	Overview of 802.11	<ul style="list-style-type: none"> <li>▪ Overview of 802.11 Networks (Ad-hoc Mode , Infrastructure Mode, WPANs 802.15, 802.15.1 Bluetooth, 802.15.3 UWB, 802.15.4 Zigbee networks, 802.16 WiMax)</li> </ul>	1 week
11	GPRS and Bluetooth	<ul style="list-style-type: none"> <li>• GPRS</li> <li>• Bluetooth Technology</li> </ul>	1 week

طرق التقييم المستخدمة:

التاريخ	نسبة الامتحان من العلامة الكلية	الامتحانات
/ / : التاريخ	40%	النصفي
/ / : التاريخ	10%	أعمال الفصل
/ / : التاريخ	50%	الامتحانات النهائية

طرق التدريس:

❖ Lecture

الكتب و المراجع:

الكتاب المقرر:

1. Mobile Communications - Jochen Schiller Pearson Education, New Delhi

المراجع:

1. Mobile Communications - Jochen Schiller Pearson Education, New Delhi.
2. Wireless Communication of Networks - William Stallings PHI
3. BlueTooth - Demystified Nathan J.Muller Tata McGraw - Hill  
Publication, New Delhi. Digital Communications - Feher