

## MODULE DESCRIPTOR

<b>MODULE TITLE</b>	Wireless and Mobile Networks		
<b>MODULE CODE</b>	CO3514 (L6)	<b>CREDIT VALUE</b>	20 credits / 10 ECTS
<b>SCHOOL</b>	SCHOOL OF SCIENCE		

### MODULE AIMS

1. To enable students to develop a strong theoretical understanding of Wireless and Mobile networks.
2. To provide students with hands-on experience in the set-up, configuration and testing of Wireless Networks.
3. To develop understanding of how wireless and mobile technologies can be applied in both business and home environments.
4. To encourage students to expand their knowledge about new networking technologies from published research materials and to conduct independent investigations into wireless and mobile network related areas.

### MODULE CONTENT

Wireless and mobile networks systems have become an essential part of the modern world. This module focuses on these technologies in depth, covering both the theory and practice of their use.

#### EM Radiation

What is EM radiation, how radios work, EM radiation propagation, modulation, spectrum management and licensing, antennas, multiplexing, spectrum analysers, spread spectrum techniques such as FHSS and OFDM

#### Wireless LANs

Technologies such as 802.11 a/b/g/n/ac/ad, their strengths and limitations, methods of implementation such as site surveys etc. Business vs home use.

#### Wireless network security

Topics such as WEP, WPA, WPA2, Pre-shared keys vs Enterprise level security, Wired-side security such as VLANs, VPNs, firewalls and webpage filtering etc.

#### Mobile Networks

An introduction to mobile networks and how they compare to technologies such as 802.11 Technologies such as 2G/3G/3.9G/4G/5G will be covered

#### Future Developments

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## **INTENDED LEARNING OUTCOMES**

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On successful completion of this module a student will be able to:

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1. Build and deploy secure, effective wireless networks
  2. Assess the performance and limitations of wireless networking systems.
  3. Critically evaluate the trends and emerging technologies in wireless and mobile networks
  4. Present an analytical argument in this subject area
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## **TEACHING METHODS**

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This module will provide students with fundamental theoretical knowledge through lecture sessions, which will also introduce topics for further investigation by the students. Practical sessions will complement the lectures. Students are expected to be actively engaged in research activities into relevant networking topics by making full use of external learning resources, such as the Web, magazines, and other professionally published material.

The approach of assessment as learning is used, with students undertaking the assignment work during practical sessions. The assessment requires the students to design, build and test a secure wireless network based on a case study, and then present a short report arguing the case for adoption of the wireless network, or not, for the case study organisation. The exam will also be based around a case study, and it will require students to critically evaluate network designs and recommendations.

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## **ASSESSMENT METHODS**

This module is assessed through an Investigative Assignment (50%) and an examination (50%).