Advanced Wireless Technologies

Course Overview

This module provides a comprehensive examination of key networking concepts applicable to the design and implementation of modern day WiFi networks. Wireless access technologies such as; IEEE 802.11 and Bluetooth are explored, highlighting the technical aspects and key evolutionary factors; specifically, those that influence throughput advancement.

Duration

5 Days

Delivery Method

Classroom based, instructor led tuition with elements of guided research to develop academic writing skills.

Audience

The course is aimed at people who are looking to establish themselves in the telecommunications industry as wireless network surveyors, architects, field engineers and planners.

Course Prerequisites

Students attending this course should have completed 7CS005 & 7CS004 or have relevant industrial experience.

Course Objectives

On completion of the course delegates will be able to:

- Describe the organisations and laws governing the use of wireless networks.
- Understand fundamental networking components and their services.
- Understand the fundamental concepts and operating principles of wireless.
- Describe the concepts and benefits of Voice over Wireless (Wireless VoIP).
- Understand the terminology and jargon used with wireless LANs.
- Perform and understand professional planning, surveys, design and implementation processes with 802.11 wireless LANs.
- Build a basic wireless LAN.
- Understand the security issues with wireless and its potential impact.
- Identify the different components within an end-to-end networking architecture utilising multiple wireless technologies.
- Understand common use cases for IoT.
- Explain the use of Bluetooth.
- Identify technical issues that commonly occur on wireless networks.
- Understand how Point-to-Point and Point-to-Multi Point networks are designed.
- Understand IP addressing structure.

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Advanced Wireless Technologies (continued)

Content Headings

Network Basics

- Home network issues
- Ethernet
- PoE
- Basic IP
- DHCP
- Networking components
- OSI model
- TCP/IP model
- TCP vs UDP
- Network sizes

Networks Advanced

- IEEE 802.11 topology
- Practical BSS construction
- IPv4 and IPV6
- Subnetting
- DNS
- PTP & PTMP
- IEEE 802.11 frequency allocation
- IEEE 802.11 throughput standards
- Mesh networking

Security and Surveys

- IEEE 802.11 security
- Security circumvention
- WiFi survey planning and methodology
- Survey tools
- Survey site visit

IEEE 802.15

- Bluetooth introduction
- Bluetooth topology
- Bluetooth low energy
- Bluetooth High rate
- Bluetooth 5

Network Project

- Network build 1
- Network fault exercise
- Wireless festival project

Assignment/Assessment

The student will submit a 4000-6000 word assignment on a subject covered in the course syllabus within 6 months of course completion.

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