

**MODULE CODE:** CSAC6002

**TITLE:** Wide Area Networks

**ATED:** 01/06/20117

**LEVEL:** 6

**CREDITS:** 20

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#### **AIM(S)**

- To study in depth the technical issues related to WAN technologies. To have a detailed knowledge of WAN protocols and technologies and to understand the fundamental technical principles underlying autonomous systems.

#### **LEARNING OUTCOMES**

Upon the successful completion of this module, the student should be able to demonstrate the ability to:

1. Demonstrate in depth theoretical understanding of WAN protocols and technologies in a network.
2. Design, implement and test various WAN protocols within a complex wide area network
3. Demonstrate a conceptual understanding of WAN technologies and protocols to critically evaluate current research and advanced scholarship in wide area networks.

#### **INDICATIVE CONTENT**

- WAN concepts
- Point-to-Point protocol
- Cellular and radio networks
- Fibre networks
- Introduction to BGP
- Broadband solutions
- Network security and monitoring

#### **LEARNING AND TEACHING STRATEGY**

The majority of factual material will be presented in lectures using handouts, guided reading and use of internet and intranet material as required.

Tutorial classes will concentrate on the technical design

Laboratories will be used to allow students to gain advanced routing and switching skills with the aid of lab equipment and appropriate software such as OPNET, Packet tracer, GNS, etc.

The allocation of teaching to deliver the module is:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| Scheduled learning   | 60         | 30%         |
| Independent learning | 140        | 70%         |
| Placement learning   | 0          |             |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## ASSESSMENT

*Description of each assessment component and its weighting, together with an example for new forms of assessment:*

### Assessment Component 1 – Written - 50% (2 Hours)

Complete a written examination to demonstrate technical knowledge based on theoretical principles.

### Assessment Component 2 – Practical Test - 50% (2 Hours)

This assessment will require students to implement and test complex WAN protocols over WAN and LAN internetworks. This will be a lab based examination.

### Assessment Summary

| Activity type | Percentage  |
|---------------|-------------|
| Written       | 50%         |
| Coursework    | 0%          |
| Practical     | 50%         |
| <b>TOTAL</b>  | <b>100%</b> |

## BIBLIOGRAPHY

### Essential

*Connecting Networks companion guide* by Cisco Networking Academy, Cisco Press, 2014

Todd Lammle (2016), CCNA Routing and Switching Complete Study Guide: Exam 100-105, Exam 200-105, Exam 200-125 Sybex

### Background

Andrew S Tanenbaum, David J. Wetherall (23 Jul 2013) Computer Networks, Pearson

D. E. Comer, (2014) *Computer Networks and Internets*, 6<sup>th</sup> Ed, Upper Saddle River, N.J Pearson education.

K. Pahlavan and P. Krishnamurthy (2009), *Networking Fundamentals*, John Wiley and Sons Inc.

### Websites

<http://www.netacad.com> (username and password required)