MODULE **DESCRIPTOR**

MODULE TITLE	Advanced Network Routing		
MODULE CODE	CO3513 (L6)	CREDIT VALUE	20 credits / 10 ECTS
SCHOOL	SCHOOL OF SCIENCE		

MODULE **AIMS**

1. To reinforce the students' prior knowledge of communications and computer networks.
2. To enable students to gain further knowledge and understanding of routing protocols, their functions and appropriate use.
3. To enable students to critically evaluate current and future developments in networking technologies.
4. To provide the students with hands on experience on how to configure, program, and troubleshoot routers and switches for certain scenarios.
5. Prepare students for the Cisco CCNA qualification.

MODULE **CONTENT**

This module extends and reinforces previously learnt networking skills on both a theoretical and a practical level. It will enable students to gain the necessary skills to use switches efficiently and configure routers in a multi-protocol network environment. This module covers Cisco semester 3 and 4 to prepare students for the Cisco CCNA qualification.

Scaling Networks
Hierarchical Network Design, Access layer, Distribution layer, and Core Layers, Use of Switches and Routers to Manage Failure Domains

Switching concepts
Switch Configuration and Security, Redundancy, Etherchannel, Spanning-Tree protocol, HSRP, VLANs

Wireless Networks
802.11 Technology, Security and Configuration

Classless routing
Protocols such as OSPF and EIGRP for both IPv4 and IPv6, Basic OSPF Configuration, OSPF Multi-area Configuration,

IPv4 and IPv6
Addressing, subnetting, NAT, ACLs

WAN Technologies
HDLC, PPP, Frame Relay, VPNs

Network Administration
Tools and Techniques, Documentation and Security, Teleworking

Future Developments

INTENDED **LEARNING OUTCOMES**

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

1. Plan, design and install a network that meets the requirements of a business case study.

2. Configure routers and switches in multiprotocol internetworks using both LAN and WAN interfaces

3. Critically evaluate current network set-up, administration, and maintenance practices in the light of continuous change in network technology

TEACHING METHODS

Theoretical concepts will be introduced and discussed in lectures then students will use the practical sessions to build and test a range of networks incorporating the theoretical concepts. The practical exercises will incorporate physical, virtual and simulated networks. Students are expected to utilise the range of teaching and learning resources developed by Cisco alongside the taught classes. Students are also expected to research and consider alternative technologies to those offered by Cisco.

The assessments will involve students being given networking tasks for a business case study, such as a preconfigured but malfunctioning network, and/or a networking design, that they are expected to document, critically analyse and problem solve to arrive at a fully functioning network.

ASSESSMENT METHODS

This module is assessed through two Practical Assessment with write up.