

Module code: MOD005342	Version: 7 Date Amended: 16/Jul/2026
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1. Module Title
Network Routing and Switching Essentials

2a. Module Leader
Ronak Al-Haddad

2b. School
School of Computing and Information Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
30

4b. Study Hours
300

5. Restrictions			
Type	Module Code	Module Name	Condition
Pre-requisite:	MOD009062	Introduction to Networks	Compulsory
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:			

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

Computer networks underpin modern digital infrastructure, enabling communication between devices, applications, cloud services, and distributed systems. A sound understanding of networking principles is essential for designing, deploying, and maintaining reliable, scalable, and secure networked environments. This module introduces the fundamental concepts and protocols of routing and switching, combining theoretical foundations with practical, hands on experience.

You'll study core networking technologies, including IPv4 and IPv6 addressing, subnetting, Ethernet switching, and Virtual Local Area Networks (VLANs). The module explores inter-VLAN communication, static and dynamic routing, and essential network services such as DHCP and Network Address Translation (NAT/PAT), alongside mechanisms for improving network resilience and availability, including first-hop redundancy protocols and the Spanning Tree Protocol. Learning is supported through a combination of lectures and guided laboratory exercises, providing practical experience with industry-standard networking equipment and simulation platforms such as Cisco Packet Tracer or equivalent tools. These activities develop the skills required to configure, troubleshoot, and manage modern enterprise networks.

The module aligns with the Cisco Certified Network Associate (CCNA) curriculum, providing a strong foundation for professional certification and further study in networking and cybersecurity. By the end of the module, you'll have developed the technical knowledge and practical skills required for careers in network engineering, infrastructure engineering, network operations, and related areas of contemporary IT.

6b. Outline Content

- Switching Concepts
- VLANs
- Inter-VLAN Routing
- DHCPv4
- SLAAC and DHCPv6 Concepts
- LAN Security Concepts
- Switch Security Configuration
- Routing Concepts
- IP Static Routing

6c. Key Texts/Literature

The reading list to support this module is available at: <https://readinglists.aru.ac.uk/>

6d. Specialist Learning Resources

Students studying this module will be able to access on-line materials including the Cisco Networking Academy online curriculum (<http://www.netacad.com>), the VLE, and access a specialist laboratory (Netlab).

7. Learning Outcomes (threshold standards)

No.	Type	On successful completion of this module the student will be expected to be able to:
1	Knowledge and Understanding	Evaluate concepts and theories about routing and switching.
2	Knowledge and Understanding	Critically discuss the implications of routing protocols and switching technologies applied to the design of networks for small/medium organisations.
3	Knowledge and Understanding	Evaluate the security implications within a small routable network
4	Intellectual, practical, affective and transferrable skills	Design and test a small routable network comprising switched LAN and WAN components.
5	Intellectual, practical, affective and transferrable skills	Configure routers and switches to implement small routable networks supported with desired network technologies.
6	Intellectual, practical, affective and transferrable skills	Design and implement security in a small routable network.

8a. Module Occurrence to which this MDF Refers

Year	Occurrence	Period	Location	Mode of Delivery
2026/7	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence

Learning Activities	Hours	Learning Outcomes	Details of Duration, frequency and other comments
Lectures	24	1-6	Lecture 2 hr x 12 weeks
Other teacher managed learning	24	1-6	Laboratory 2 hr x 12 weeks
Student managed learning	252	1-6	Laboratory sessions, remote laboratory facility
TOTAL:	300		

9. Assessment for the above Module Occurrence

The assessment for some modules includes a presentation (see below for details on how this particular module is assessed). We recognise that presenting, especially to a large group, can cause significant anxiety or distress for some students. If this may affect you, please contact your Module Leader or the Disability and Neurodiversity Service as early as possible. We will work with you to consider appropriate reasonable adjustments. Depending on your individual needs, these might include, for example, presenting to a smaller group or presenting only to a member of academic staff.

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
010	Coursework	4-6	60 (%)	Fine Grade	30 (%)

Coursework assignment up to 2500 words, on application of networking solutions comprising both local and wide area networks.

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
011	Coursework	1-3	40 (%)	Fine Grade	30 (%)

In class test 1 hour 30 minutes

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:

- (a) achieve the qualifying mark for each element of fine graded assessment as specified above**
- (b) pass any pass/fail elements**

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]