

Module specification

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| Module Code | COM489 |
| Module Title | CCNA - Switching, Routing and Wireless Essentials |
| Level | 4 |
| Credit value | 20 |
| Faculty | FAST |
| HECoS Code | 100365 |
| Cost Code | GACP |

Programmes in which module to be offered

| | |
|---|---|
| Programme title | Is the module core or option for this programme |
| Stand-alone module aligned to BSc (Hons) Cyber Security for QA and assessment | Option |

Pre-requisites

None

Breakdown of module hours

| | |
|--|----------------|
| Learning and teaching hours | 18 hrs |
| Placement tutor support | 0 hrs |
| Supervised learning e.g. practical classes, workshops | 18 hrs |
| Project supervision (level 6 projects and dissertation modules only) | 0 hrs |
| Total active learning and teaching hours | 36 hrs |
| Placement / work based learning | 0 hrs |
| Guided independent study | 164 hrs |
| Module duration (total hours) | 200 hrs |

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| For office use only | |
| Initial approval date | 08/11/2023 |
| With effect from date | Aug 2024 |
| Date and details of revision | |



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| For office use only | |
| Version number | 1 |

Module aims

This module introduces the architecture, structure, functions, components and models of computer networks and the Internet. The Cisco Certified Network Associate (CCNA) - CCNA - Switching, Routing and Wireless Essentials material is the focus of study for this module. It uses the OSI and TCP layered models to examine the nature and roles of protocols and services at the application, network, data link and physical layers. The module delves into routing protocols, placing emphasis on the core concept of routing within networks and the internet. The goal is to provide a comprehensive understanding of routing principles and practices. The module explores switching concepts, including the examination of Virtual Local Area Networks (VLANs) and their functionalities. Additionally, the module covers the topic of inter-VLAN routing and its implementation. The module encompasses the study of Wireless Local Area Network (WLAN) technology, including its components, operation, channel management, as well as the examination of WLAN threats and security measures.

Module Learning Outcomes - at the end of this module, students will be able to:

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|---|--|
| 1 | Apply the fundamental concepts of switching and routing in computer networks. |
| 2 | Demonstrate different network switching technologies and their applications. |
| 3 | Explain the principles and protocols used in routing; how they enable efficient data communication. |
| 4 | Demonstrate wireless networking technologies and their advantages and disadvantages. |
| 5 | Analyse and troubleshoot common network connectivity issues related to switching, routing and wireless technologies. |

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

The module will involve continuous coursework that revolves around real-world scenarios centred on modern networking technologies. Key assessment tasks will focus on network design, implementation, and testing. The operation of switches, routers and wireless technologies will be the focus of the assessments. This includes creating local area networks



with suitable IP addressing schemes and configuring switches and routers to establish connectivity within a network topology.

| Assessment number | Learning Outcomes to be met | Type of assessment | Weighting (%) |
|-------------------|-----------------------------|--------------------|---------------|
| 1 | 1, 2, 3, 4, 5 | Portfolio | 100% |

Derogations

None

Learning and Teaching Strategies

In line with the Active Learning Framework, this module will be blended digitally with both a VLE and online community. Content will be available for students to access synchronously and asynchronously and may indicatively include first and third-party tutorials and videos, supporting files, online activities any additional content that supports their learning.

As this module progresses, the strategies will change to best support a diverse learning environment. Initially, the module will start with a heavier reliance on engaging tutor-led lectures, demonstrations, and workshops to ensure that the students get the relevant threshold concepts. As the module continues experiential and peer learning strategies will be encouraged as the students' progress with their portfolio work.

Assessment will occur throughout the module to build student confidence and self-efficacy in relation to applied mathematical and technical concepts.

Indicative Syllabus Outline

Yearly content will be updated to represent the most appropriate content for current industry technologies, but a list of indicative topics could include:

- Switching Concepts
- VLANs and InterVLAN Routing
- Switch Configuration
- Secure Remote Access
- Frame Forwarding
- Collision and Broadcast Domains
- VLAN Trunks
- Redundant Networks
- Available and Reliable Networks
- L2 Security and WLANs
- Routing Concepts and Configuration
- STP Operations
- EtherChannel
- DHCPv4
- SLAAC and DHCPv6
- Static and Dynamic Routing

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

Cisco Certified Network Associate (CCNA) – Switching, Routing, and Wireless Essentials

Other indicative reading

O. Wendell, CCNA 200-301 Official Cert Guide Library: Advance Your It Career with Hands-On Learning, Cisco Press, 2020

L. Peterson, B. Davie, Computer Networks: A Systems Approach (The Morgan Kaufmann Series in Networking), Morgan Kaufmann, 2021