

<b>Module Code:</b>	COM429
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<b>Module Title:</b>	CCNA Routing & Switching - Routing and Switching Essentials
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<b>Level:</b>	4	<b>Credit Value:</b>	20
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<b>Cost Centre(s):</b>	GACP	<b>JACS3 code:</b>	I120
		<b>HECoS code:</b>	100365

<b>Faculty:</b>	Arts, Science and Technology	<b>Module Leader:</b>	Dr. Paul Comerford
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Scheduled learning and teaching hours	36 hrs
Guided independent study	164 hrs
Placement	0 hrs
<b>Module duration (total hours)</b>	<b>200 hrs</b>

<b>Programme(s) in which to be offered (not including exit awards)</b>	Core	Option
BSc (Hons) Computer Science	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BSc (Hons) Computing	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BSc (Hons) Computer Networks and Security	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BSc (Hons) Cyber Security	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BSc (Hons) Computer Science (with Industrial Placement)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BSc (Hons) Computing (with Industrial Placement)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BSc (Hons) Computer Networks and Security (with Industrial Placement)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BSc (Hons) Cyber Security (with Industrial Placement)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Delivery as standalone or part of CPD package	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Pre-requisites</b>
None

**Office use only**

Initial approval: 28/11/2018

Version no:1

With effect from: 01/09/2019

Date and details of revision:

Version no:

## Module Aims

This describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. Students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks.

## Intended Learning Outcomes

### Key skills for employability

KS1	Written, oral and media communication skills
KS2	Leadership, team working and networking skills
KS3	Opportunity, creativity and problem solving skills
KS4	Information technology skills and digital literacy
KS5	Information management skills
KS6	Research skills
KS7	Intercultural and sustainability skills
KS8	Career management skills
KS9	Learning to learn (managing personal and professional development, self-management)
KS10	Numeracy

At the end of this module, students will be able to

Key Skills

		KS1	KS2
1	Evaluate the basic switching concepts and the operation of switches including how VLANs create logically separate networks and how routing occurs between them.	KS3	KS4
		KS5	
2	Identify the purpose, nature, and operations of a router, routing tables, and the route lookup process.	KS1	KS2
		KS3	KS4
		KS5	
3	Compare and contrast the use of static, default and dynamic routing protocols (distance vector and link-state).	KS1	KS2
		KS3	KS4
		KS5	
4	Design, plan and implement access control lists (ACLs) for IPv4 and IPv6 networks.	KS1	KS2
		KS3	KS4
		KS5	
5	Evaluate the use of Dynamic Host Configuration Protocol (DHCP) for IPv4 and IPv6 networks.	KS1	KS2
		KS3	KS4
		KS5	
6	Design, plan and implement Network Address Translation (NAT) operations.	KS1	KS2
		KS3	KS4
		KS5	

### Transferable skills and other attributes

**Derogations**

None

**Assessment:**

## Indicative Assessment Tasks:

Students undertaking this module are registered for the Cisco Networking Academy system and use is made of this material for the assessment. Assessment 1 is the Cisco on-line test set by the Academy but administered by Glyndwr University.

Assessment 2 - Practical exercise that takes place in the Glyndwr networking laboratory. This typically requires students to work in groups of 2 where they design a network involving Switches as well as Routers, build it on real equipment, troubleshoot and demonstrate the operation to the supervisor. The exercise is based on the material studied as part of the Cisco CCNA Routing and Switching Routing and Switching Essentials.

Assessment 3 – Individually students produce a report based on the material studied applied to a specific scenario which may well be the basis of the practical exercise or an example taken from a typical business environment.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	1-3,5	In-class test	40	1.25 hours	
2	4-6	Practical	40	2 hours	
3	1-4	Coursework	20		1000

**Learning and Teaching Strategies:**

The module is taught using a structured programme of online learning, mini-seminars, tutorials, practical exercises and student-centred learning specifically:

Self-directed learning using on-line material and lectures to supplement on-line material

On-line multiple choice tests to give formative feedback

Lab sessions to gain practical networking experience and re-enforce theory Individual assignment work as part lab work and skills test

Web based research

**Syllabus outline:**

Routing Concepts  
 Static Routing  
 Dynamic Routing  
 Switched Networks  
 Switch Configuration  
 VLANs  
 Access Control Lists  
 DHCP  
 NAT for IPv4  
 Device Discovery, Management, and Maintenance

<b>Indicative Bibliography:</b>
<b>Essential reading</b>
CCNA Routing and Switching 200-125 Official Cert Guide Library Hardcover –2016: Ciscopress
<b>Other indicative reading</b>