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MODULE DESCRIPTOR

Module Title

Routing and Switching

Reference	CM2103	Version	4
Created	June 2022	SCQF Level	SCQF 8
Approved	July 2016	SCQF Points	15
Amended	July 2022	ECTS Points	7.5

Aims of Module

To provide the student with an understanding of routing and switching concepts used within Local Area Networks.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Select suitable equipment, and protocols for use in Wide Area Networks.
- 2 Diagnose problems and propose solutions to basic problems in equipment selection, protocol use and configurations in a Wide Area Network.
- 3 Analyse and explain routing and switching concepts.
- 4 Configure appropriate routing and switching within a Local Area Network.
- 5 Troubleshoot Local Area Networks.

Indicative Module Content

Understand and describe dynamic routing protocols, distance vector routing protocols, and link-state routing protocols. Configure and troubleshoot basic operations of routers in a small routed network: Routing Information Protocol (RIPv1 and RIPv2). Open Shortest Path First (OSPF) protocol (single-area OSPF) Configure and troubleshoot VLANs and inter-VLAN routing. Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6. Introduction to Switched Networks: LAN Design, The Switched Environment. Basic Switching Concepts and Configuration: Basic Switch Configuration, Switch Security: Management and Implementation. Implementing VLAN Security: VLAN Segmentation, VLAN Implementations, VLAN Security and Design. Routing Concepts: Initial Configuration of a Router, Routing Decisions, Router Operation. Inter VLAN Routing, Inter-VLAN Routing Configuration, Troubleshoot Inter-VLAN Routing, Layer 3 Switching. Static Routing: Static Routing Implementation, Configure Static and Default Routes, Review of CIDR and VLSM, Configure Summary and Floating Static Routes, Troubleshoot Static and Default Route issues. Routing Dynamically: Dynamic Routing Protocols, Distance Vector Dynamic Routing, RIP and RIPvng Routing, Link-State Dynamic Routing, The Routing Table. Single-Area OSPF: Characteristics of OSPF, Configure Single-Area OSPFv2, Configure Single-Area OSPFv3. Access Control Lists: IP ACL Operation, Standard IPv4 ACLs, Extended IPv4 ACLs, Troubleshoot ACLs, IPv6 ACLs. DHCP, Dynamic Host Configuration Protocol v4, Dynamic Host Configuration Protocol v6. Network Address Translation for IPv4, NAT Operation, Configuring NAT, Troubleshooting NAT. Standards and Best Practice Guides: ISO 27001, ISO 27014, TOGAF.

Module Delivery

This module is taught using a structured programme of web based learning materials, web-based activities, practical exercises and student centred learning.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	30	N/A
Non-Contact Hours	120	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Examination	Weighting:	50%	Outcomes Assessed:	1, 2
Description:	A written exam which comprises routing and switching concepts.				

Component 2

Type:	Practical Exam	Weighting:	50%	Outcomes Assessed:	3, 4, 5
Description:	A practical exam comprising the setup and configuration of a small network.				

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

The calculation of the overall grade for this module is based on 50% weighting of C1 and 50% weighting of C2. An overall minimum grade D is required to pass the module.

		Examination:						
		A	B	C	D	E	F	NS
Practical Exam:	A	A	A	B	B	C	E	
	B	A	B	B	C	C	E	
	C	B	B	C	C	D	E	
	D	B	C	C	D	D	E	
	E	C	C	D	D	E	E	
	F	E	E	E	E	E	F	
NS		Non-submission of work by published deadline or non-attendance for examination						

Module Requirements

Prerequisites for Module	CM1103 Computer Systems & Networking, or equivalent.
Corequisites for module	None.
Precluded Modules	None.

ADDITIONAL NOTES

This module represents Course 2 of the four course CCNA (Cisco Certified Networking Associate) Routing and Switching Curriculum. The material for the course is provided by Cisco to the University in the form of web-based learning and assessment mechanisms as well as lab equipment in the form of routers and switches for practical training.

INDICATIVE BIBLIOGRAPHY

- 1 Lammle, T., 2020. CCNA Certification Study Guide, Volume 2: Exam 200-301. ISBN: 978-1-119-65918-1
- 2 COMER, D., 2015. Computer networks and Internets: Global edition. 6th ed. United Kingdom: Pearson Education.
- 3 Kurose, J. & Ross, K., 2017. Computer Networking: A Top-Down Approach, 7th Edition, Pearson.