



Diploma in Routing (111) – Connecting Routing Devices

Prerequisites: Knowledge in Windows operating system.	Corequisites: A pass or higher in Certificate in Networking or equivalence.
Aim: The course covers network terminology, network protocols, Local-area networks (LANs), Wide-area networks (WANs), Open System Interconnection (OSI) model, cabling, routers, Router programming, Ethernet Internet Protocol (IP) addressing and network standards. The course focuses on initial router configuration, Cisco IOS Software management, routing protocol configuration, TCP/IP, and access control lists (ACLs). Candidates will develop skills on how to configure a router, manage Cisco IOS Software, configure routing protocol on routers, and set the access lists to control the access to routers. The course also focuses on advanced IP addressing techniques: Variable Length Subnet Masking (VLSM); Intermediate routing protocols such as RIP v2, single-area OSPF, and EIGRP; command-line interface configuration of switches, ethernet switching, Virtual LANs (VLANs), Spanning Tree Protocol (STP), VLAN Trunking Protocol (VTP). Other topics include Advanced IP addressing techniques, Network Address Translation (NAT), Port Address Translation (PAT), Dynamic Host Configuration Protocol (DHCP), WAN technology and terminology, PPP, ISDN, DDR, Frame Relay, and Network management.	
Required Materials: Cisco routers	Supplementary Materials: Lecture notes and tutor extra reading recommendations.
Special Requirements: The course requires a combination of lectures, demonstrations, discussions, and hands-on labs.	
Intended Learning Outcomes: Part I Fundamentals of Cisco Networking 1. Describe the different types of area networks, ways to categorise them and how computers communicate with one another over a shared network medium.	Assessment Criteria: Part I Fundamentals of Cisco Networking 1.1 Analyse how networks impacts our lives 1.2 Outline network architectures 1.3 Describe the OSI seven layer model 1.4 Analyse computer number system (binary, octal, hexadecimal) 1.5 Outline elements of network communication 1.6 Outline the history of the internet 1.7 Identify the application layer functions and protocols 1.8 Describe the services and role of transport layer 1.9 Analyse the protocols and role of network layer 1.10 Outline the IPv4 address structure 1.11 Be able to calculate network, host and broadcast addresses 1.12 Outline the TCP/IP protocol suites 1.13 Explain logical topologies and role of data link layer 1.14 Outline the physical layer protocols 1.15 Identify hardware found at physical layer 1.16 Identify Ethernet technologies 1.17 Outline LAN and WAN cabling requirements 1.18 Be able to connect a Cisco router

	1.19 Be able to configure Cisco interfaces 1.20 Be able to use basic show commands
<p>Part II Cisco Routing Concepts</p> <p>2. Describe a routing protocol, the types of routing protocols, specific characteristics of routing protocols and the difference between routed versus routing protocols.</p>	<p>Part II Cisco Routing Concepts</p> <p>2.1 Identify router components 2.2 Identify router LAN and WAN interfaces 2.3 Outline Cisco IOS features 2.4 Be able to configure a router for basic routing 2.5 Explore neighbour discovery tools, telnet and troubleshooting commands 2.6 Analyse router boot sequence and be able to manage Cisco IOS file system and filenames 2.7 Distinguish routing protocols and routed protocols 2.8 Be able to configure static routing 2.9 Be able to configure and troubleshoot RIP routing protocol 2.10 Be able to configure and troubleshoot IGRP routing protocol 2.11 Analyse characteristics of Distance Vector (DV) routing protocol 2.12 Be able to configure and troubleshoot EIGRP routing protocol 2.13 Outline hybrid routing protocol features 2.14 Be able to configure and troubleshoot OSPF routing protocol 2.15 Describe OSPF routing protocol characteristics 2.16 Analyse TCP/IP error and control messages 2.17 Identify TCP/UDP functions, operation and services 2.18 Outline DHCP, NAT and PAT configuration 2.19 Describe traffic filtering 2.20 Be able to configure Standard and Extended Access Control Lists</p>
<p>Part III Switching & WAN technologies</p> <p>3. Demonstrate how the advent of faster computer networks and a far more stable infrastructure has come the need for a quicker way to “switch” information around, including the best known methods for doing so.</p> <p>4. Describe the various protocols and technologies used in wide- area network (WAN) environments like point-to-point links, circuit switching, packet switching, virtual circuits, dialup services, and WAN devices are all linked together.</p>	<p>Part III Switching & WAN technologies</p> <p>3.1 Define Layer 2 switching 3.2 Outline LAN switch operation 3.3 Define collision and broadcast domains 3.4 Be able to configure a switch 3.5 Outline cut-through, fragment free, store and forward LAN 3.6 Describe Spanning Tree Protocol (STP) 3.7 Define Virtual LAN (VLAN) 3.8 Explore VLAN Trunking Protocol (VTP) 3.9 Outline Inter-VLAN routing</p> <p>4.1 Contrast LAN vs WAN 4.2 Identify WAN terminology 4.3 Discuss WAN standards organisations 4.4 Explore physical layer standards 4.5 Identify WAN connection technologies 4.6 Describe WAN data link protocols</p>




Tel: 0044 7423211037

Email: info@londoncomputercollege.co.uk Website: www.londoncomputercollege.co.uk

Registered No: 3267009 (England)

	4.7	Outline PPP layered architecture
	4.8	Explore PPP authentication protocols
	4.9	Describe ISDN standards
	4.10	Describe Dial-on-Demand Routing (DDR)
	4.11	Define dialer profile elements
	4.12	Describe the components of frame relay network
	4.13	Explore frame relay topologies

**Recommended Learning Resources:
Connecting Routing Devices**

Text Books	<ul style="list-style-type: none"> • Cisco IOS 12.0 Solutions for Network Protocols: IP, IP Routing v. 1 by Cisco Systems Inc. and Technologies Riva ISBN-10: 1578701546 • ICND: Interconnecting Cisco Network Devices by Thomas M. Thomas, Michael Coker, Dan Golding and Andrew G. Mason ISBN-10: 0072125225 • CCNA 1 and 2: Companion Guide by Cisco Systems Inc. ISBN-10: 1587131501
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	Cisco IOS version 12 or above

Tel: 0044 7423211037

Email: info@londoncomputercollege.co.uk Website: www.londoncomputercollege.co.uk

Registered No: 3267009 (England)