Business & Computing Examinations (BCE)
LONDON (UK)

Networking ProgrammeAnalysis

The development of BCE qualifications include extensive market research from the following sources:

- Data from BCE Centre Annual Reports.
- Enquiries received from different stakeholders.
- Email survey from statutory consultees and stakeholder bodies.
- Questionnaire survey from BCE learners.
- Input received during Approved Centres and Corporate companies training seminar.
- BCE discussions and feedback from potential employers.

BCE learners are 18+, classified as follows:

- Holders of General Certificate of Secondary Education (GCSE) intending to obtain a programme for employment or further education.
- Those already in employment furthering their knowledge for promotion or to venture into new fields.
- Corporate Companies approaching BCE directly or Approved Centres for in-house training.
- Those looking for career change.
- Mature adults with no formal qualifications.

Guided Learning Hours is the entire notional learning hours representing estimate of total amount of time reasonably required for learners to achieve necessary level of attainment for the award of a qualification.

Activities that contribute to guided learning hourse include:

- Guided Learning
- Independent and unsupervised research/learning
- Unsupervised compilation of a portfolio of work experience
- Unsupervised e-learning
- Unsupervised e-assessment
- Unsupervised coursework
- Watching a pre-recorded podcast or webinar
- Unsupervised work-based learning

Activities that contribute to Guided Learning include:

- Classroom-based learning supervised by a Tutor
- Work-based learning supervised by a Tutor
- Live webinar or telephone tutorial with a Tutor in real time
- E-learning supervised by a Tutor in real time
- Forms of assessment

Level 4 Certificate in Networking (129 Credits)

With the advent of the internet, networking is now one of the most rewarding jobs. Households and organisations need to connect to the internet, making networking knowledge mandatory.

Why does the programmeexists – Every organisation requires a network; be it connecting computer for sharing data or resources i.e. printing. However, the 21st internet technology makes network configuration a *must*. The programmeprovides practical and theoretical knowledge for networking operating system.

How it fits into the larger programme – Networking is comparable to the telephone system – it is found almost anywhere – every organisation need to share resources – creating more chances of getting a job.

For whom it was designed – The Level 4 Certificate in Networking programmeis designed for learners who have completed the Level 5 Diploma in Information Technology or Level 4 Certificate in Computer Fundamentals programmeor holders of equivalent qualifications interested in pursuing networking.

How it will benefit learners – Learners can look for employment or pursue the Level 5 Diploma in PC Engineering & Structured Cabling; Level 5 Diploma in IP Routing; Level 4 Certificate in Unix; Level 5 Diploma in Unix or Windows Networking.

Units:

- Networking Essentials
- Windows Client Networking
- Windows Server Administration & Implementation
- TCP/IP Network Architecture
- Network Security

Networking Essentials - basic concepts and principles that underline computer networking, from the simplest peer-to-peer local area networks to the vastly complex wide area networks that reach across international boundaries and around the world. Networking essentials is an overview of networking terminology, different network architectures, and focus on the physical components of computer networks, including server and client computers, cabling and connectors, network file sharing, area networks and network types, basic network topologies, network routers, network protocol, TCP/IP - Transmission Control Protocol / Internet Protocol, firewalls, ethernet and network addresses.

Windows Client Networking – users sit on a client machine and forward information to the server. Understanding the client machine network side is equally as important as understanding the server side. What makes client networking important is that users temper with a lot of things on their system, hence failure is common. Whereas the server is inaccessible (in most cases, servers are kept in remote places), hence secure and rare to common user faults. Even Administrators don't sit on the server, except in special circumstances (mostly access the server via a client machine).

Windows Server Administration & Implementation – Windows Server is an operating system which runs on the server computer. The person in charge of the server is called an Administrator and his/her responsibilities are administering users, groups, and domains in a network; including account administration, architecture, boot process, directory replication, directory services, group administration, installation, network services, administration tools, permissions, system policies, TCP/IP, and user profiles. Apart from the administration side, the server has system utilities, such as the registry monitor, the Windows file monitor, the NTFS file system, DNS, DHCP, WINS, and other services such as the kernel, core files NTLDR, NTOSKRNL.EXE, HAL.DLL, KERNEL32.DLL, NTDLL.DLL, SRV.SYS, TCPIP.SYS, WINSOCK.DLL, NTLANMAN.DLL, RASAUTH.DLL, NTFS.SYS which need to be monitored constantly.

TCP/IP Network Architecture – TCP/IP is a protocol used by all major network operating systems, including the routing protocols and the internet. Both Network Administrators and IT security professionals must have the fundamental knowledge of TCP/IP to do their jobs. With that comes a necessity to be able to analyse TCP/IP traffic in order to troubleshoot network problems, analyse attacks, and better understand and secure their systems. Computers need an IP address to be able to communicate with one another.

Network Security – The largest network in the world is the Internet. As long as one is using the internet, they are part of the network. This creates a major security issue. Not only people around your office, or in your neighbourhood, area, county, country BUT the entire world can try to access your data. Understanding network security prepares a nation against data theft hence can secure company or personal information, leading to saving millions for the country. Networking operating systems offer users an integrated network logon solution based on advanced public key technology. The Networking operating system verifies and authenticates the validity of each party involved in an electronic transaction and let users log on to a domain server using the additional security provided by smartcards. In today's world of electronic business transactions, organisations need a method to authenticate the identity and validity of users accessing information on computer networks. A public key infrastructure (PKI) is a system that provide solutions for secure eCommerce and network services. A PKI consists of protocols, services, and standards supporting applications of public key cryptography. In a PKI, every user is assigned a cryptographic key pair consisting of a public key and private key that are mathematically related. The public key is published, while the private key is kept secret.

Unit	Pre-requisite	Core-requisite	Guided Learning Hours	Number of Credits
Networking Essentials	Basic knowledge in the	A pass or higher in Diploma in	260	26

	use of Microsoft Windows Applications.	Information Technology or equivalence		
Windows Client Networking	Basic knowledge in the use of Microsoft Windows Applications.	A pass or higher in Diploma in Information Technology or equivalence	220	22
Windows Server Administration & Implementation	Basic knowledge in the use of Microsoft Windows Applications.	A pass or higher in Diploma in Information Technology or equivalence	220	22
TCP/IP Network Architecture	Basic knowledge in the use of Microsoft Windows Applications.	A pass or higher in Diploma in Information Technology or equivalence	220	22
Network Security	Basic knowledge in the use of Microsoft Windows Applications.	A pass or higher in Diploma in Information Technology or equivalence	220	22
Coursework (Project) for all units			150	15

Rules of combination:	All units are mandatory
Age Group:	18+
ProgrammeType:	Vendor/Industry

Networking Essentials Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Elements of a network and layers of the OSI model	2.0	8	6	2	2	2	20
02	TCP/IP protocol suite	2.0	8	6	2	2	2	20
03	Data transmission concepts	2.0	8	6	2	2	2	20
04	LAN physical topologies and LAN connectivity hardware	2.0	8	6	2	2	2	20
05	WAN technology	2.0	8	6	2	2	2	20
06	The functions of a networking operating system	2.0	8	6	2	2	2	20
07	Ethernet technology	2.0	8	6	2	2	2	20
08	TCP/IP applications	2.0	8	6	2	2	2	20
09	Network addressing	2.0	8	6	2	2	2	20
10	Effective troubleshooting methodology	2.0	8	6	2	2	2	20
11	Upgrading networking operating system software	2.0	8	6	2	2	2	20
12	Network and system level fault-tolerance technologies	2.0	8	6	2	2	2	20
13	Security risks in LANs and WANS	2.0	8	6	2	2	2	20
		26.0	**104**					**260**

Windows Client Networking Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Windows Desktop operating	2.0	8	6	2	2	2	20
02	User access and logging in	2.0	8	6	2	2	2	20
03	Configuring disk partitions	2.0	8	6	2	2	2	20
04	Sharing resources	2.0	8	6	2	2	2	20
05	Network configuration	2.0	8	6	2	2	2	20
06	Network connectivity parameters	2.0	8	6	2	2	2	20
07	Connecting to domain	2.0	8	6	2	2	2	20
08	Wireless network connections	2.0	8	6	2	2	2	20
08	Windows client security management	2.0	8	6	2	2	2	20
10	Network security configuration settings	2.0	8	6	2	2	2	20
11	Administrative tools for maintaining Windows client	2.0	8	6	2	2	2	20
		22.0	**88**					**220**

Windows Server Administration & Implementation Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Windows server basic feature	2.0	8	6	2	2	2	20
02	Installing and configuring Windows server	2.0	8	6	2	2	2	20
03	Domain controller Active Directory features	2.0	8	6	2	2	2	20
04	Physical and logical storage organisational structure	2.0	8	6	2	2	2	20
05	File systems, permissions and shared folder permissions	2.0	8	6	2	2	2	20
06	User accounts	2.0	8	6	2	2	2	20
07	User and group accounts security rights	2.0	8	6	2	2	2	20
08	Network printing	2.0	8	6	2	2	2	20
09	TCP/IP, DHCP and DNS network concepts	2.0	8	6	2	2	2	20
10	Group Policy	2.0	8	6	2	2	2	20
11	Monitoring server performance	2.0	8	6	2	2	2	20
		22.0	**88**					**220**

TCP/IP Network Architecture Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	OSI model	2.0	8	6	2	2	2	20
02	TCP/IP protocol suite	2.0	8	6	2	2	2	20
03	Classful addressing	2.0	8	6	2	2	2	20
04	Classless addressing	2.0	8	6	2	2	2	20
05	Configuring IP Addresses	2.0	8	6	2	2	2	20
06	Delivering, forwarding and routing of IP packets	2.0	8	6	2	2	2	20
07	Installing and configuring DHCP	2.0	8	6	2	2	2	20
08	Address Resolution Protocol (ARP)	2.0	8	6	2	2	2	20
09	TCP/IP utilities	2.0	8	6	2	2	2	20
10	Installing and configuring SNMP	2.0	8	6	2	2	2	20
11	Troubleshooting TCP/IP	2.0	8	6	2	2	2	20
		22.0	**88**					**220**

Network Security Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Network security terminology	2.0	8	6	2	2	2	20
02	Information systems security issues	2.0	8	6	2	2	2	20
03	Symmetrical vs asymmetrical cryptography	2.0	8	6	2	2	2	20
04	Cryptographic standards	2.0	8	6	2	2	2	20
05	Authentication	2.0	8	6	2	2	2	20
06	Network Vulnerabilities	2.0	8	6	2	2	2	20
07	Firewall architecture	2.0	8	6	2	2	2	20
08	Computer security threats and technologies	2.0	8	6	2	2	2	20
09	Securing network applications	2.0	8	6	2	2	2	20
10	Network security devices	2.0	8	6	2	2	2	20
11	Incidents, disasters and recovery plans	2.0	8	6	2	2	2	20
		22.0	**88**					**220**

Level 4 Certificate in Unix Networking (119 Credits)

Unix is one of the oldest networking operating systems and Windows is one of the most commonly used networking operating system. Hence knowledge in both networking systems makes one more marketable.

Why does the programmeexists – Networking is a technology used for business and private purposes. With the advent of the internet, networking is now at the forefront. Behind the scenes, most applications (including Windows, Web, Routing) use Unix. Learners who undertake this programmehave greater chances of getting employment.

How it fits into the larger programme – An organisation can either run Unix or Windows networking system or both. This increase the chances of employment and also equip learners with the most sought after networking knowledge. With the rapid growth in the technology and telecommunications industry, the demand for skilled professionals who can maintain network systems and develop effective and efficient procedures is growing rapidly.

For whom it was designed – This programmeis designed for learners who complete the Certificate in Networking or those with equivalent qualifications interested in pursuing networking further.

How it will benefit learners – Learners benefit immensely because they are likely to get employment. Learners also have a choice of furthering their knowledge by advancing in Diploma in Unix or pursuing the Diploma in PC Engineering & Structured Cabling; IP Routing or Diploma in Windows.

Units:

- Overview of Operating Systems
- Introduction to SCO Unix
- Introduction to Linux
- Introduction to Solaris
- Introduction to Shell Programming

Overview of Operating Systems – Operating Systems have evolved over the years. This unit looks at Microsoft Client Operating Systems, Macintosh and Unix versions. Being able to differentiate networking operating system is vital to future Network Administrators – this helps them to select the best networking system suitable for their organisations or be able to troubleshoot the different operating systems. The job of an operating system is to orchestrate the various parts of the computer - the processor, the on-board memory, the disk drives, keyboards, video monitors, etc. to perform useful tasks. The operating system is the master controller of the computer, the glue that holds together all the components of the system, including the administrators, programmers, and users. To do something on the computer, like start a program, copy a file, or display the contents of a directory, it is the operating system that must perform these tasks.

Introduction to SCO Unix – Santa Cruz Operations (SCO) was the first UNIX network operating system to run on Intel (PC); hence harbours similar features of MS-DOS/Windows. The UNIX operating system comprises three parts: the kernel, the standard utility programs, and the system configuration files. **The kernel** - is the core of the UNIX operating system. Basically, the kernel is a large program that is loaded into memory when the machine is turned on, and it controls the allocation of hardware resources from that point forward. The kernel knows what hardware resources are available (like the processor(s), the on-board memory, the disk drives, network interfaces, etc.), and it has the necessary programs to talk to all the devices connected to it. **The standard utility programs** - these programs include simple utilities like *cp*, which copies files, and complex utilities, like the shell that allow users to issue commands to the operating system. **The system configuration files** - are read by the kernel, and some of the standard utilities. The UNIX kernel and the utilities are flexible programs, and certain aspects of their behaviour can be controlled by changing the standard configuration files. One example of a system configuration file is the filesystem table "*fstab*", which tells the kernel where to find all the files on the disk drives. Another example is the system log configuration file "*syslog.conf*", which tells the kernel how to record the various kinds of events and errors it may encounter.

Introduction to Linux - Linux is a unix networking operating system used in many applications including the Internet. See Introduction SCO Unix above.

Introduction to Solaris – Solaris UNIX is one of the most used networking operating systems in big organisations like banks. See Introduction SCO Unix above.

Introduction to Shell Programming – The Introduction to SCO, Linux and Solaris looks at UNIX commands. Once candidates grasp the commands, they can then pursue the most challenging task – programming! Shell Programming is widely used to write applications used to perform mundane tasks like backup, checking system space etc.

Unit	Pre-requisite	Core-requisite	Guided Learning Hours	Number of Credits
Overview of Operating Systems	Knowledge in Windows operating system	A pass or higher in Certificate in Networking or equivalence	200	20
Introduction to SCO Unix	Knowledge in Windows operating system	A pass or higher in Certificate in Networking or equivalence	240	24
Introduction to Linux	Knowledge in Windows operating system	A pass or higher in Certificate in Networking or equivalence	200	20
Introduction to Solaris	Knowledge in Windows operating system	A pass or higher in Certificate in Networking or equivalence	200	20
Introduction to Shell Programming	Knowledge in Windows operating system	A pass or higher in Certificate in Networking or equivalence	200	20
Coursework (Project) for all units			150	15

Rules of combination:	All units are mandatory
Age Group:	18+
ProgrammeType:	Vendor/Industry

Overview of Operating Systems Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Functions of operating systems	2.0	8	6	2	2	2	20
02	Different operating systems	2.0	8	6	2	2	2	20
03	Network security threats	2.0	8	6	2	2	2	20
04	Virtualisation technologies	2.0	8	6	2	2	2	20
05	Single tasking operating systems	2.0	8	6	2	2	2	20
06	Multi-tasking operating systems	2.0	8	6	2	2	2	20
07	Windows operating system versions	2.0	8	6	2	2	2	20
08	Windows file systems	2.0	8	6	2	2	2	20
09	Unix operating systems	2.0	8	6	2	2	2	20
10	Client networking tools	2.0	8	6	2	2	2	20
		20.0	**80**					**200**

Introduction to SCO Unix Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Features, platforms and functionality	2.0	8	6	2	2	2	20
02	SCO login	2.0	8	6	2	2	2	20
03	SCO files structure	2.0	8	6	2	2	2	20
04	Inode table	2.0	8	6	2	2	2	20
05	Unix file permission	2.0	8	6	2	2	2	20
06	*vi* editor	2.0	8	6	2	2	2	20
07	Electronic Mail	2.0	8	6	2	2	2	20
08	Unix shell commands	2.0	8	6	2	2	2	20
09	Invoking a shell script	2.0	8	6	2	2	2	20
10	Unix processes	2.0	8	6	2	2	2	20
11	Unix utilities	2.0	8	6	2	2	2	20
12	X Windows system architecture	2.0	8	6	2	2	2	20
		24.0	**96**					**240**

Introduction to Linux Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Different Linux flavours	2.0	8	6	2	2	2	20
02	Basic Linux commands	2.0	8	6	2	2	2	20
03	Linux file system	2.0	8	6	2	2	2	20
04	Linux processes	2.0	8	6	2	2	2	20
05	Redirection operators	2.0	8	6	2	2	2	20
06	Text editor	2.0	8	6	2	2	2	20
07	Linux graphical environment	2.0	8	6	2	2	2	20
08	Linux print service	2.0	8	6	2	2	2	20
09	Data backup and recovery	2.0	8	6	2	2	2	20
10	Linux networking tools	2.0	8	6	2	2	2	20
		20.0	**80**					**200**

Introduction to Solaris Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Boot process phases	2.0	8	6	2	2	2	20
02	Solaris system basics	2.0	8	6	2	2	2	20
03	Solaris file system	2.0	8	6	2	2	2	20
04	Text editor	2.0	8	6	2	2	2	20
05	Solaris user environment	2.0	8	6	2	2	2	20
06	Killing a process	2.0	8	6	2	2	2	20
07	Regular Expressions - grep	2.0	8	6	2	2	2	20
08	Solaris X Windows system environment	2.0	8	6	2	2	2	20
09	Solaris networking technologies	2.0	8	6	2	2	2	20
10	Solaris user and group accounts	2.0	8	6	2	2	2	20
		20.0	**80**					**200**

Introduction to Shell Programming Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Unix shell environment	2.0	8	6	2	2	2	20
02	Shell command-line interface	2.0	8	6	2	2	2	20
03	Shell variable terminology	2.0	8	6	2	2	2	20
04	Shell predefined parameters	2.0	8	6	2	2	2	20
05	Shell scripting	2.0	8	6	2	2	2	20
06	If command	2.0	8	6	2	2	2	20
07	Shell conditional operators	2.0	8	6	2	2	2	20
08	Shell function procedures	2.0	8	6	2	2	2	20
09	Passing patterns on the command line	2.0	8	6	2	2	2	20
10.	Shell signal handling	2.0	8	6	2	2	2	20
		20.0	**80**					**200**

Level 5 Diploma in Unix Networking (149 Credits)

Unix is one of the oldest networking and efficient operating systems. Hence knowledge in different Unix systems makes one more marketable.

Why does the programmeexists – Networking is a technology used for business and private purposes. With the advent of the internet, networking is now at the forefront. A combination of SCO, Linux, Solaris and Shell/Perl cannot be over played. Learners who undertake this programmehave greater chances of getting employment.

How it fits into the larger programme – An organisation can either run SCO Unix, Linux or Solaris networking system or all of them. This increases the chances of employment and also equip learners with the most sought after networking knowledge. With the rapid growth in the technology and telecommunications industry, the demand for skilled professionals who can maintain network systems and develop effective and efficient procedures is growing rapidly.

For whom it was designed – This programmeis designed for learners who complete the Certificate in Unix Networking or those with equivalent qualifications interested in pursuing Unix networking further.

How it will benefit learners – Learners benefit immensely because they are likely to get employment. Learners also have a choice of furthering their knowledge by pursuing the Diploma in Windows Networking or the Diploma in PC Engineering & Structured Cabling or Diploma in IP Routing.

Subjects:

- UNIX Performance Management
- SCO Unix Administration
- Linux Administration
- Solaris Administration
- Perl Programming

Unix Performance Management – In UNIX, everything is a file; even a hard drive is a file. Hence understanding the UNIX management is a requirement for every Unix Network Administrator. Being able to tune Unix system leads to efficient running of all programs.

SCO Unix Administration – All UNIX commands are very similar (just like English *English* or American *English*) pronunciation might be different or there might an "z" instead of "s" – but the meaning and syntax is identical. However, on Administration, UNIX systems are very different, though the tasks are the same; creating users, assigning permissions/rights and security (see Linux Administration below)

Linux Administration - the use of system administration tools and tasks, which include: booting and shutting down the system; adding and removing user accounts; using backup programs; performing *fsck* and maintaining system database files (groups, hosts, aliases, etc.). The maintaining aspect of the Unix operating system include job control, hard and soft linking, shell and kernel programs and security procedures. Other aspects of the Unix operating system are: paging/swapping, inter-process communication, devices and device drivers, file system concepts like inode and superblock, networking/distributed computing environments and concepts, configuring NFS and NIS, using nslookup or research to check information in the DNS and writing detailed scripts.

Solaris Administration – Most Oracle Databases sit on top of Solaris Server. However, Solaris Administration looks at tasks performed by Administrators in maintaining the system (see Linux Administration above). Another important unit is the Oracle Solaris Network Administration (see Diploma in Database Administration).

Perl Programming – Perl programming is mainly used in Web programs. Remember that UNIX and the Internet are related, hence Perl Programming is part of that relationship.

Unit	Pre-requisite	Core-requisite	Guided Learning Hours	Number of Credits
Unix Performance Management	Knowledge in Unix operating system.	A pass or higher in Certificate in Unix Networking or equivalence.	240	24
SCO Unix Administration	Knowledge in Unix operating system.	A pass or higher in Certificate in Unix Networking or equivalence.	260	26
Linux Administration	Knowledge in Unix operating system.	A pass or higher in Certificate in Unix Networking or equivalence.	260	26
Solaris Administration	Knowledge in Unix operating system.	A pass or higher in Certificate in Unix Networking or equivalence.	260	26
Perl Programming	Knowledge in Unix operating system.	A pass or higher in Certificate in Unix Networking or equivalence.	260	26
Coursework (Project) for all units			210	21

Rules of combination:	All units are mandatory
Age Group:	18+
ProgrammeType:	Vendor/Industry

Unix Performance Management Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	System resources performance evaluation	2.0	8	6	2	2	2	20
02	Performance analysis steps	2.0	8	6	2	2	2	20
03	Kernel configuration and compilation	2.0	8	6	2	2	2	20
04	Priority management process	2.0	8	6	2	2	2	20
05	Process and thread management	2.0	8	6	2	2	2	20
06	Input and output management	2.0	8	6	2	2	2	20
07	Unix sockets process management	2.0	8	6	2	2	2	20
08	Remote Procedure Call (RPC)	2.0	8	6	2	2	2	20
09	Performance benchmarking	2.0	8	6	2	2	2	20
10	Unix File System (UFS)	2.0	8	6	2	2	2	20
11	Distributed File System (DFS)	2.0	8	6	2	2	2	20
12	Unix virtual memory system	2.0	8	6	2	2	2	20
		24.0	**96**					**240**

SCO Unix Administration Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Setting user account in SCO-Admin	2.0	8	6	2	2	2	20
02	Unix process and file management	2.0	8	6	2	2	2	20
03	Volume system and backup process tools	2.0	8	6	2	2	2	20
04	Unix print services and system execution	2.0	8	6	2	2	2	20
05	SCO file structure and installation process	2.0	8	6	2	2	2	20
06	Unix system ports and securing network	2.0	8	6	2	2	2	20
07	TCP/IP applications, networking configuration manager	2.0	8	6	2	2	2	20
08	Routing	2.0	8	6	2	2	2	20
09	WAN/LAN connectivity	2.0	8	6	2	2	2	20
10	DNS server configuration	2.0	8	6	2	2	2	20
11	Performance tuning	2.0	8	6	2	2	2	20
12	Setting and configuring internet service monitoring agent	2.0	8	6	2	2	2	20
13	Network layer security and email tools	2.0	8	6	2	2	2	20
		26.0	**104**					**260**

Linux Administration Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Linux server infrastructure configuration	2.0	8	6	2	2	2	20
02	X Windows System Protocol	2.0	8	6	2	2	2	20
03	Linux system *startup* process	2.0	8	6	2	2	2	20
04	Patching the kenerl	2.0	8	6	2	2	2	20
05	User administrative management	2.0	8	6	2	2	2	20
06	Linux system environment	2.0	8	6	2	2	2	20
07	Linux network configuration	2.0	8	6	2	2	2	20
08	Printing services	2.0	8	6	2	2	2	20
09	Proxy service	2.0	8	6	2	2	2	20
10	Linux file system	2.0	8	6	2	2	2	20
11	Linux backup software	2.0	8	6	2	2	2	20
11	Linux automation tools	2.0	8	6	2	2	2	20
13	Linux network security tools	2.0	8	6	2	2	2	20
		26.0	**104**					**260**

Solaris Administration Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Solaris hardware platforms	2.0	8	6	2	2	2	20
02	Installing and configuring Solaris	2.0	8	6	2	2	2	20
03	Solaris Management Console	2.0	8	6	2	2	2	20
04	Solaris file system commands	2.0	8	6	2	2	2	20
05	Managing user accounts	2.0	8	6	2	2	2	20
06	Managing group accounts	2.0	8	6	2	2	2	20
07	Solaris system backup and recovery	2.0	8	6	2	2	2	20
08	Solaris print server configuration	2.0	8	6	2	2	2	20
09	Solaris partitions and slices	2.0	8	6	2	2	2	20
10	Solaris network configuration	2.0	8	6	2	2	2	20
11	Setting up NFS Services	2.0	8	6	2	2	2	20
12	Solaris Naming Services	2.0	8	6	2	2	2	20
13	Solaris Server Intranet	2.0	8	6	2	2	2	20
		26.0	**104**					**260**

Perl Programming Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Introduction to scripting language	2.0	8	6	2	2	2	20
02	Perl built-in data types	2.0	8	6	2	2	2	20
03	Perl input/output flow control operations	2.0	8	6	2	2	2	20
04	Perl data structures	2.0	8	6	2	2	2	20
05	Perl string manipulation facilities	2.0	8	6	2	2	2	20
06	Perl string processing	2.0	8	6	2	2	2	20
07	Perl multidimensional arrays	2.0	8	6	2	2	2	20
08	Perl subroutines	2.0	8	6	2	2	2	20
09	Perl file input and output	2.0	8	6	2	2	2	20
10	Perl glob function	2.0	8	6	2	2	2	20
11	Perl formats writing reports	2.0	8	6	2	2	2	20
12	Perl database and command gateway interfaces	2.0	8	6	2	2	2	20
13	Perl Database Independent Interface (DBI)	2.0	8	6	2	2	2	20
		26.0	**104**					**260**

Level 5 Diploma in Windows Server Networking (155 Credits)

Windows is one of the most commonly used networking operating system. Hence knowledge in this widely used networking system makes one more marketable.

Why does the programmeexists – Networking is a technology used for business and private purposes. With the advent of the internet, networking is now at the forefront. The importance of Windows programmecannot be over played. Learners who undertake this programmehave greater chances of getting employment.

How it fits into the larger programme – An organisation can either run Unix or Windows networking system or both. This increase the chances of employment and also equip learners with the most sought after networking knowledge. With the rapid growth in the technology and telecommunications industry, the demand for skilled professionals who can maintain information systems and develop effective and efficient procedures is growing rapidly.

For whom it was designed – This programmeis designed for learners who complete the Certificate in Networking / Certificate in Unix / Diploma in Unix or those with equivalent qualifications interested in pursuing networking further.

How it will benefit learners – Learners benefit immensely because they are likely to get employment. Learners also have a choice of furthering their knowledge by pursuing the Diploma in PC Engineering & Structured Cabling or the IP Routing.

Units:

- Windows Server Administration
- Windows Server Infrastructure
- Windows Server Active Directory
- Windows SQL Server Administration
- Windows Exchange Server

Windows Server Administration – There are different versions of Windows Server operating system. The Windows Server product line consists of five products: **Standard Edition**, **Enterprise Edition**, **Datacenter Edition**, **Web Edition** and **Home server**.

Windows Network Infrastructure – the network infrastructure elements include: network topology; routing; IP addressing; name resolution such as WINS and DNS, virtual private networks, remote access and telephony solutions.

Windows Active Directory - Active Directory is Microsoft's answer to Novell's Directory Services. It supports a single unified view of all objects on a network (no matter what size) and locating and managing resources faster and easier. It is based on the Lightweight Directory Access Protocol, and the Directory Services in Exchange. Just as one might admire a diamond by looking at its different facets, one can build up a picture of Active Directory by examining its many sides. The seven sides of Active Directory are: (i) the successor to NT 4.0's SAM database (ii) Directory services containing users, computers and printers (iii) a search mechanism to find those resources (iv) Logical Structure - Domain, Tree & Forest and Organisational Units (v) Group Policy - thanks to Active Directory one can lock down the desktop and assign software (vi) Physical Sites, Subnets and Locations (vii) the Schema and how it defines Active Directory objects.

Windows SQL Database Server Administration – Windows SQL competes with Oracle Database. Though big companies widely use Oracle, the easy availability and well known nature of Microsoft products makes SQL an important database and is also widely used.

Windows Exchange Server – the Exchange Server controls organisations' emailing system.

Unit	Pre-requisite	Core-requisite	Guided Learning Hours	Number of Credits
Windows Server Administration	Knowledge in Windows operating system.	A pass or higher in Certificate in Networking or equivalence.	300	30
Windows Server Infrastructure	Knowledge in Windows operating system.	A pass or higher in Certificate in Networking or equivalence.	200	20
Windows Server Active Directory	Knowledge in Windows operating system.	A pass or higher in Certificate in Networking or equivalence.	260	26
Windows SQL Server Database Administration	Knowledge in Windows operating system.	A pass or higher in Certificate in Networking or equivalence.	280	28
Windows Exchange Server	Knowledge in Windows operating system.	A pass or higher in Certificate in Networking or equivalence.	300	30
Coursework (Project) for all units			210	21

Rules of combination:	All units are mandatory
Age Group:	18+
ProgrammeType:	Vendor/Industry

Windows Server Administration Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Overview of Windows Server versions	2.0	8	6	2	2	2	20
02	Windows server installation	2.0	8	6	2	2	2	20
03	Windows server environment	2.0	8	6	2	2	2	20
04	Active Directory Domain services	2.0	8	6	2	2	2	20
05	Configuring and troubleshooting DHCP	2.0	8	6	2	2	2	20
06	Configuring and troubleshooting DNS	2.0	8	6	2	2	2	20
07	Windows server print services	2.0	8	6	2	2	2	20
08	Windows server data storage	2.0	8	6	2	2	2	20
09	Active Directory Certificate services	2.0	8	6	2	2	2	20
10	Remote and Routing Access Service (RRAS)	2.0	8	6	2	2	2	20
11	Managing server virtualisation	2.0	8	6	2	2	2	20
12	Windows server application functionalities	2.0	8	6	2	2	2	20
13	Windows File permissions	2.0	8	6	2	2	2	20
14	Windows server performance monitoring	2.0	8	6	2	2	2	20
15	Reliability-Availability-Serviceability (RAS)	2.0	8	6	2	2	2	20
		30.0	**120**					**300**

Windows Server Infrastructure Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Windows server network concepts	2.0	8	6	2	2	2	20
02	Installing Windows server	2.0	8	6	2	2	2	20
03	DHCP functionality, concepts and features	2.0	8	6	2	2	2	20
04	DNS server configuration	2.0	8	6	2	2	2	20
05	Routing and Remote Access (RRAS)	2.0	8	6	2	2	2	20
06	File services installation and configuration	2.0	8	6	2	2	2	20
07	Windows server print services	2.0	8	6	2	2	2	20
08	Windows server update Services configuration	2.0	8	6	2	2	2	20
09	IPSec configuration	2.0	8	6	2	2	2	20
10	Network Access Protection (NAP) configuration	2.0	8	6	2	2	2	20
		20.0	**80**					**200**

Windows Server Active Directory Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Installing Active Directory on Windows server	2.0	8	6	2	2	2	20
02	Active Directory Design	2.0	8	6	2	2	2	20
03	Active Directory sites and replication	2.0	8	6	2	2	2	20
04	Active Directory global catalog	2.0	8	6	2	2	2	20
05	Active Directory administration tools	2.0	8	6	2	2	2	20
06	Windows security planning and administrative delegation	2.0	8	6	2	2	2	20
07	Windows server group policy	2.0	8	6	2	2	2	20
08	User and computer environment management	2.0	8	6	2	2	2	20
09	Group policy software installation and deployment	2.0	8	6	2	2	2	20
10	Group Policy management	2.0	8	6	2	2	2	20
11	Active Directory performance management	2.0	8	6	2	2	2	20
12	DNS and Active Directory domain services integration	2.0	8	6	2	2	2	20
13	Active Directory Certificate Service implementation	2.0	8	6	2	2	2	20
		26.0	**104**					**260**

Windows SQL Server Database Administration Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Functions of Microsoft SQL server	2.0	8	6	2	2	2	20
02	Microsoft SQL server installation	2.0	8	6	2	2	2	20
03	SQL server user and object administrative tools	2.0	8	6	2	2	2	20
04	Creating database	2.0	8	6	2	2	2	20
05	Importing/exporting data	2.0	8	6	2	2	2	20
06	Retrieving information using SQL Select statements	2.0	8	6	2	2	2	20
07	Inserting and updating SQL database	2.0	8	6	2	2	2	20
08	SQL command functions	2.0	8	6	2	2	2	20
09	Creating transactions in SQL server	2.0	8	6	2	2	2	20
10	Creating data indexing	2.0	8	6	2	2	2	20
11	Database backup and restoration	2.0	8	6	2	2	2	20
12	SQL server security features	2.0	8	6	2	2	2	20
13	SQL server reporting services	2.0	8	6	2	2	2	20
14	SQL Server Integration Services (SSIS)	2.0	8	6	2	2		20
		28.0	**112**					**280**

Windows Exchange Server Learning Hours Information Sheet

Unit Titles		Credits	Notional Learning Hours					
			Guided / Contact Learning	Independent Learning	Research Activities / Group Work	Assessment (self/class)	Coursework	Total
01	Introduction to Exchange server	2.0	8	6	2	2	2	20
02	Exchange server structure	2.0	8	6	2	2	2	20
03	Exchange message routing architecture	2.0	8	6	2	2	2	20
04	Exchange server and Active Directory integration	2.0	8	6	2	2	2	20
05	Exchange console features	2.0	8	6	2	2	2	20
06	Managing addressing and recipient objects	2.0	8	6	2	2	2	20
07	Managing and configuring public folders	2.0	8	6	2	2	2	20
08	Exchange server storage groups	2.0	8	6	2	2	2	20
09	Administrative group policies	2.0	8	6	2	2	2	20
10	Exchange Server routing groups	2.0	8	6	2	2	2	20
11	Exchange Powershell commands	2.0	8	6	2	2	2	20
12	Exchange server chat service	2.0	8	6	2	2	2	20
13	Email security and foreign mail systems	2.0	8	6	2	2	2	20
14	Exchange server performance maintenance	2.0	8	6	2	2	2	20
15	Exchange server site replication	2.0	8	6	2	2	2	20
		30.0	**120**					**300**