



SEVERN  
BUSINESS  
COLLEGE

## Qualifi Level 4 Diploma in IT - Networking

Course Handbook



**Qualification**

Qualifi Level 4 Diploma in IT - Networking

**Ofqual Number**

603/4782/X

**Level**

4

**Total Qualification Time**

1200

**Credit Value**

120

**Aim of the Course**

The purpose of the qualifications is to provide learners with the technical skills and knowledge needed to work in the information technology (IT) industry. It is envisaged that the qualifications will encourage both academic and professional development so that you learners move forward to realise not just their own potential but also that of organisations across a broad range of sectors.

**Assessment**

Assessment is through practical assignments, with no exams - to more accurately reflect the real working environment.

**Course Structure**

Qualifi Level 4 Diploma in IT - Networking			
Unit number	Units	Unit level	Unit credit
4IT01	Information Technology and IT Ethics	4	20
4IT02	Mathematics and Statistics for IT	4	20
4IT03	PC Maintenance and Operating Systems	4	20
4IT04	Computer Graphics Editing and Database Concepts	4	20
4IT05	Logical IT Networking	4	20
4IT06	Physical IT Networking	4	20

**Assessment Grades**

Grade	Marking Criteria
Pass	All learning outcomes are achieved. All assessment criteria are met.
Fail	All learning outcomes are not achieved. All assessment criteria are not met.
No Marks	Plagiarism

**UNIT SPECIFICATIONS****Unit Title**

Information Technology and IT Ethics

**Level**

4

**Learning Time Hours**

200

**Credit Value**

20

**Unit aim**

This unit aims to develop learners' knowledge and use of information technology, including the use of standard office applications to prepare documents and presentations. This includes computer software and hardware, basic computer operations, application software, operating systems, information systems and IT-related issues in computing. The unit also seeks to provide learners with an awareness of ethical issues essential to an IT professional. This includes ethics in the cyberspace,

intellectual property, privacy, the issue of security and reliability, how computing affects our health, professional code of ethics and how IT changes our daily lives.

### Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning Outcome	Assessment Criteria
1. Understand the applications of information technology	1.1. Analyse the uses, strengths and limitations of different categories of hardware and software 1.2. Analyse the applications of artificial intelligence (AI) 1.3. Produce a specification of requirements for an application that meets the brief 1.4. Create and present presentations that demonstrate an application layout using planning tools
2 Understand the ethics involved in information technology	2.1 Analyse the nature of information technology ethics and its application to IT 2.2 Analyse the analogy that relates ethics, morality and society 2.3 Assess how and why information technology gives rise to ethical dilemmas not present in other technologies 2.4 Evaluate the issues relating to IT ethics, justifying their conclusions

### Indicative Content

- Today 's technologies: computers, devices, and the web
- Connecting and communicating online: The Internet, websites, and media
- Microsoft Office Word
- Computers and mobile devices: evaluating options for home and work
- Programs and apps: productivity, graphics, security, and other tools
- Digital security, ethics, and privacy: threats, issues, and defences
- Computing components: processors, memory, the cloud,
- Microsoft Office PowerPoint
- Input and output extending capabilities of computers and mobile devices
- Digital storage preserving content locally and on the cloud
- Operating system managing, coordinating, and monitoring resources
- Microsoft Office Excel
- Communicating digital content wired and wireless networks and devices
- Building solutions database, system, and application development tools
- Catalysts for change
- Introduction to ethics
- Networked communications
- Intellectual property
- Information privacy
- Privacy and the government
- Computer and network security
- Computer reliability
- Professional ethics
- Work and wealth

### Supplementary Text and Reading:

- Shelly, Cashman and Vermaat (2016) Discovering Computers 2016 – A Gateway to Information, Thomson Course Technology.
- Quinn MJ (2016) Ethics for the Information Age, 7th edition, Pearson Education.
- Breaux T (2015) Introduction to IT Privacy: A Handbook for Technologists, IAPP Publication.

## UNIT SPECIFICATIONS

### Unit Title

Mathematics and Statistics for IT

### Level

4

### Learning Time Hours

**Credit Value**

20

**Unit aim**

This unit aims to provide an opportunity to learn mathematics and statistics and equip learners with the mathematical skills to analyse and solve problems that will enable them to work within the field of IT. The unit covers number systems, logic, relations, functions, quadratic equations, quadratic functions, simultaneous equations, polynomial equations, exponential functions, logarithmic functions, coordinate geometry and matrices. The unit provides an opportunity to learn statistics and equip learners with the descriptive and analytical methods for dealing with variability in observed data. It covers the graphical presentation of data, descriptive statistics, index numbers, correlation and regression, time series, probability and statistical inference.

**Learning outcomes and assessment criteria**

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning Outcome	Assessment Criteria
1 Understand the mathematics underpinning information technology	1.1 Explain the nature of the roots of quadratic equations, the rules of exponents and logarithms and a function 1.2 Explain the relationship between a domain, range and function 1.3 Rewrite an exponential equation in logarithmic form and a logarithmic equation in exponential form 1.4 Compute maximum and minimum values of quadratic functions, composite functions, inverse functions, the area of a polygon, the equation of a straight line, locus, measures of central tendency and measures of dispersion and probability 1.5 Analyse the impact of quadratic inequalities, polynomial equations, exponential equations, logarithmic equations and simultaneous equations on hardware design
2 Understand the statistics underpinning information technology	2.1 Calculate summary measures correctly 2.2 Define and interpret probability models 2.3 Evaluate methods of estimation and hypothesis testing 2.4 Analyse the concepts of statistical methodologies

**Indicative Content**

- Functions
- Quadratic equations
- Simultaneous equations
- Indices and logarithms
- Exponential and logarithmic equations
- Coordinate geometry
- Equation of straight line and locus
- Measures of central tendency
- Measures of dispersion
- Permutations and combinations
- Probability
- Probability distribution
- Descriptive and inferential statistics, variables, data types and collection, sampling
- Frequency distribution and presentation of data
- Measures of location
- Measures of dispersion, skewness and coefficient of variation
- Index
- Time series
- Probability
- Discrete probability distribution
- Normal distribution
- Confidence intervals
- Hypothesis testing
- Testing the difference between two means, two proportion
- Correlation and regression
- Chi-squared tests and quality control

### Supplementary Text and Reading:

- Lan Foo Huat, Yong Kien Cheng (2017) Essential SPM Additional Mathematics, Sasbadi
- Wong Pek Wei, Dr. Wong Sin Mong (2016) Success Additional Mathematics SPM, Oxford Fajar
- J.S. Ratti, Marcus S. McWaters (2015) College Algebra and Trigonometry, 3rd Edition, Addison Wesley
- Judith A. Beecher, Judith A. Penna, Marvin L. Bittinger, (2016) Algebra and Trigonometry, 5th Edition, Addison Wesley
- Allan G. Bluman (2015) Elementary Statistics A Step by Step Approach, 9th Edition, McGraw Hill
- Prem S. Mann (2017) Introductory Statistics, 9th Edition, John Wiley & Sons
- Allan G. Bluman (2017) Elementary Statistics A Step by Step Approach, 10th Edition, McGraw Hill

## UNIT SPECIFICATIONS

### Unit Title

PC Maintenance and Operating Systems

### Level

4

### Learning Time Hours

200

### Credit Value

20

### Unit aim

This unit aims to provide knowledge of personal computer hardware. Successful completion of this unit will enable learners to install a computer system unit and operating system and conduct troubleshooting. The unit provides the essential knowledge of computer hardware, the software needed to make a hardware work, the components of the hardware and the technologies and principles that support the components. In addition to this knowledge, learners will be able to assemble computer hardware to build a full set PC, understand how to install the operating system and how to conduct troubleshooting in faulty hardware. This unit also aims to provide the basic concepts about operating systems and to be able to install, configure and operate two commonly used operating systems. It includes an overview of Windows and Linux operating systems, the installation and configuration of these systems; the use of proper file systems; managing groups and users; installing and uninstalling applications on these two operating systems; operating basic command-line environment; manipulating simple files and printer-sharing.

### Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning Outcome	Assessment Criteria
1. Understand a range of operating systems	1.1. Analyse the functionalities of PC hardware 1.2. Install and commission a working personal computer to the required standard 1.3. Optimize the operating system environment to the required standard 1.4. Conduct troubleshooting to identify and solve common PC problems
2. Understand Windows and Linux operating systems	2.1 Analyse the usage and the role of an operating system 2.2 Establish a disc operating environment that is appropriate to the required functionality 2.3 Configure the Windows and Linux operating systems to the required standard 2.4 Use common utilities and programs in the Windows and Linux operating systems correctly to configure file systems and to manage users and groups

### Indicative Content

- PC hardware components and software requirements
- The operating system
- PC repair
- Form factors and power supplies
- Processor and chipsets
- Motherboard
- Memory
- Hard drives v fixed drives
- Input/output devices
- Multimedia devices and mass storage

- Installing and maintaining operation systems (Windows)
- Supporting and troubleshooting operation systems
- Functions, types and features of operating systems
- Microsoft Windows
- File and printer sharing
- Distribution, strengths and weaknesses of Linux, open sources and GPL
- Installation of Linux
- Operation of Linus
- Using applications in Linux
- Types of shell and fundamental shell command

**Supplementary Text and Reading:**

- Wilson K (2018), Computer Hardware: The Illustrated Guide to Understanding Computer Hardware (Computer Fundamentals), Illuminated Press
- Tanenbaum AS (2016), Modern Operating Systems, Pearson, India
- Mueller S (2015) Upgrading and repairing PCs, 22nd Edition, Pearson India

**UNIT SPECIFICATIONS**

**Unit Title**

Computer Graphics Editing and Database Concepts

**Level**

4

**Learning Time Hours**

200

**Credit Value**

20

**Unit aim**

This unit aims to explain the concepts of photo editing. This will enable learners to insert photos into documents such as user manuals and the IT structure of an organization. The photos may need to be touched up before they are ready for use. This mainly involves using Adobe Photoshop and Adobe Illustrator for photo/image editing and designing. The unit delivers skills in photo retouching and digital drawing to address the issues of digital image design. It emphasizes exploration, techniques, media, ideas development and production techniques. This unit also provides the fundamental concepts of a database system through Database Management System (DBMS), relational databases, entity relationship modelling and normalization. Learners are also required to create database systems using the database language of Structured Query Language (SQL).

**Learning outcomes and assessment criteria**

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning Outcome	Assessment Criteria
1. Use computer graphic editing techniques to edit photos and create illustrations	1.1. Apply photo editing, retouching and repairing techniques correctly 1.2. Use Photoshop correctly to create the required effects 1.3. Create illustrations using illustration software tools to the required standard 1.4. Analyse techniques to create movement in a graphical environment
2 Create a database system	2.1 Define the concept of a relational database 2.2 Build an entity-relationship diagram, deriving relations and validating relations using normalization 2.3 Create a database using Data Definition Language (DDL) and manipulate a database using Data Manipulation Language (DML) that meets the specification

**Indicative Content**

- The work area, tools, options bar, other panels, customizing documents and workspace
- Working with selections
- Photoshop
- Photo corrections

- Layers
- Mask and channels
- Typographic design
- Selecting and aligning in Adobe Illustrator
- Creating and editing shapes including techniques to create movement in a graphical environment
- Transforming objects
- Drawing with pen and pencil tools
- Colour and painting
- Working with type
- Blending colours and shapes
- Preparing files for the web
- Data, information, database management, DMS and DAP
- Relational database
- Database Management System (DBMS)
- Structured Query Language (SQL) – Data Manipulation Language (DML)
- SQL – Data Definition Language (DDL)
- Entity relationship modelling
- Deriving ER Diagrams
- Normalization

**Supplementary Text and Reading:**

- Adobe Team (2016), Adobe Photoshop CC Classroom in a book, Adobe Press.
- Adobe Team (2017), Adobe Illustrator CC Classroom in a book, Adobe Press.
- Thomas M. Connolly and Carolyn E. Begg (2015) Database Systems: A Practical Approach to Design, Implementation and Management, Edition: 6, Addison-Wesley.

**UNIT SPECIFICATIONS**

**Unit Title**

Logical IT Networking

**Level**

4

**Learning Time Hours**

200

**Credit Value**

20

**Unit aim**

This unit aims to provide learners with knowledge of logical networking. It covers Transmission Control Protocol (TCP) / Internet Protocol (IP), Local Area Networks (LAN) and Wide Area Networking (WAN), including IP address and subnetting.

**Learning outcomes and assessment criteria**

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning Outcome	Assessment Criteria
1. Understand logical networking	1.1. Analyse the nature and features of a logical network 1.2. Analyse the differences between network architectures 1.3. Analyse the functionality of each layer in an OSI network model 1.4. Define correctly an IP address and subnet masks
2. Understand the components and interfaces between different logical networking attributes	2.1. Analyse the rules of network protocols and communications 2.2. Analyse the differences within the physical layer 2.3. Analyse the requirements of WAN and LAN topologies and a data link protocol 2.4. Analyse the differences within the network layer and transport layer 2.5. Establish network design considerations
3. Understand the security requirements of a logical network	3.1. Analyse the security requirements of a network 3.2. Identify the threats to a network



### Indicative Content

- Exploring the network
- Network protocols and communications
- Network access
- Network layer
- Transport layer
- IP addressing
- Subnetting IP network
- Network design and consideration
- Device factors
- Designing network
- Scaling network
- Security threat
- Physical threat
- Primary vulnerabilities
- Network attacks
- Mitigating network attacks
- SSH configuration
- Backup and restore configuration

### Supplementary Text and Reading:

- Lowe D (2018), Networking All-in-One for Dummies 7th Edition, John Wiley & Sons, New Jersey
- Cisco e-Learning portal (<http://cisco.netacad.net>).
- Petzold C (2000), The Hidden Language of Computer Hardware, Microsoft Press, Washington

## UNIT SPECIFICATIONS

### Unit Title

Physical IT Networking

### Level

4

### Learning Time Hours

200

### Credit Value

20

### Unit aim

This unit aims to provide learners with knowledge of physical networking and basic network administration skills. It covers knowledge of computer networks.

### Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning Outcome	Assessment Criteria
1. Apply the components of physical networking	1.1. Analyse the nature and requirements of a physical network 1.2. Analyse the requirements of different networking standards 1.3. Set up and configure LAN network devices to the required configuration
2. Understand the components and interfaces between different physical networking attributes	2.1. Analyse the requirements for the ongoing maintenance of a physical network operating system 2.2. Assess the implications of different connectivity considerations 2.3. Analyse the purpose and implications of different protocols of the application layer
3. Install security protocols in a physical	3.1. Install and configure a firewall to the required standard

network	<p>3.2. Document actions taken in response to threats to security to the required standard</p> <p>3.3. Determine the source and nature of threats to a network</p> <p>3.4. Take action to mitigate identified risks that is appropriate to the nature and scale of the risk</p>
---------	---

**Indicative Content**

- Cabling and hardware standards
- Configuring a network operating system
- Ethernet
- Application layer

**Supplementary Text and Reading:**

- Lowe D (2018), Networking All-in-One for Dummies 7th Edition, John Wiley & Sons, New Jersey
- Cisco e-Learning portal (<http://cisco.netacad.net>).
- McNab C (2016) Network Security Assessment: Know Your Network, 3rd Edition, O’REilly