OTHM LEVEL 5 EXTENDED DIPLOMA IN INFORMATION TECHNOLOGY

Qualification Number: 610/2571/9

Specification | April 2024

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QUALIFICATION OBJECTIVES

The objective of the OTHM Level 5 Extended Diploma in Information Technology is to provide learners with an excellent foundation for a career in a range of organisations. It designed to ensure that each learner is 'business ready': a confident, independent thinker with a detailed knowledge of Information Technology, and equipped with the skills to adapt rapidly to change.

The qualification is ideal for those who have started, or are planning to move into, a career in private or public sector business. Successful completion of the Level 5 Diploma in Information Technology will provide learners with the opportunity to progress to further study or employment.

QUALITY, STANDARDS AND RECOGNITIONS

OTHM Qualifications are approved and regulated by Ofqual (Office of Qualifications and Examinations Regulation). Visit the Register of Regulated Qualifications.

OTHM has progression arrangements with several UK universities that acknowledges the ability of learners after studying Level 3-7 qualifications to be considered for advanced entry into corresponding degree year/top up and Master's/top-up programmes.

REGULATORY INFORMATION

Qualification Title	OTHM Level 5 Extended Diploma in Information Technology
Ofqual Reference Number	610/2571/9
Regulation Start Date	24/04/2023
Operational Start Date	25/04/2023
Duration	2 Years
Total Credit Value	240
Total Qualification Time (TQT)	2400 Hours
Guided Learning Hours (GLH)	960 Hours
Sector Subject Area (SSA)	6.1 ICT practitioners
Overall Grading Type	Pass/Fail
Assessment Methods	Coursework
Language of Assessment	English

EQUIVALENCES

OTHM qualifications at Level 5 represent practical knowledge, skills, capabilities and competences that are assessed in academic terms as being equivalent to Foundation Degrees, Higher National Diploma (HND) and the second year of a three-year UK Bachelor's degree.

QUALIFICATION STRUCTURE

The OTHM Level 5 Extended Diploma in Information Technology consists of 12 mandatory units (six at level 4 and six at level 5) for a combined total of 240 credits, 2400 hours Total Qualification Time (TQT) and 960 Guided Learning Hours (GLH) for the completed qualification.

Unit Ref. No.	Unit title	Level	Credit	GLH	TQT
D/650/3383	Cyber Security	4	20	80	200
F/650/3384	Principles of Computer Programming	4	20	80	200
F/617/2266	Systems Analysis and Design	4	20	80	200
H/650/3385	Web and Mobile Applications	4	20	80	200
L/617/2268	Computer and Network Technology	4	20	80	200
J/650/3386	Managing Digital Information	4	20	80	200
K/617/2276	Software Engineering	5	20	80	200
H/617/2275	Database Systems	5	20	80	200
D/617/2274	Advanced systems Analysis and Design	5	20	80	200
Y/617/2273	Management Information Systems	5	20	80	200
R/617/2272	Network Information Systems	5	20	80	200
L/617/2271	IT Project Management	5	20	80	200

DEFINITIONS

Total Qualification Time (TQT) is the number of notional hours which represents an estimate of the total amount of time that could reasonably be expected to be required in order for a Learner to achieve and demonstrate the achievement of the level of attainment necessary for the award of a qualification.

Total Qualification Time is comprised of the following two elements –
   a) *the number of hours which an awarding organisation has assigned to a qualification for Guided Learning, and*
   b) *an estimate of the number of hours a Learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place as directed by – but, unlike Guided Learning, not under the Immediate Guidance or Supervision of – a lecturer, supervisor, tutor or other appropriate provider of education or training.*

(Ofqual 15/5775 September 2015)

Guided Learning Hours (GLH) is defined as the hours that a teacher, lecturer or other member of staff is available to provide immediate teaching support or supervision to a student working towards a qualification.

Credit value is defined as being the number of credits that may be awarded to a Learner for the successful achievement of the learning outcomes of a unit. One credit is equal to 10 hours of TQT.

ENTRY REQUIREMENTS

These qualifications are designed for learners who are typically aged 18 and above.
The entry profile for learners is likely to include at least one of the following:
- Relevant Level 3 Diploma or equivalent qualification
- GCE Advanced level in 2 subjects or equivalent qualification
- Mature learners (over 21) with relevant management experience (learners must check with the delivery centre regarding this experience prior to registering for the programme)

English requirements: If a learner is not from a majority English-speaking country, they must provide evidence of English language competency. For more information visit the English Language Expectations page on the OTHM website.

PROGRESSIONS

Successful completion of Level 5 Extended Diploma in Information Technology provides learners the opportunity for a wide range of academic progressions including OTHM Level 6 Diploma in Information Technology. As this qualification is approved and regulated by Ofqual (Office of the Qualifications and Examinations Regulation), learners are eligible to gain direct entry into Final year of a three-year UK Bachelor's degree. For more information visit University Progressions page.

DELIVERY OF OTHM QUALIFICATIONS

OTHM do not specify the mode of delivery for its qualifications, therefore OTHM centres are free to deliver this qualification using any mode of delivery that meets the needs of their learners. However, OTHM centres should consider the learners' complete learning experience when designing the delivery of programmes.

OTHM Centres must ensure that the chosen mode of delivery does not unlawfully or unfairly discriminate, whether directly or indirectly, and that equality of opportunity is promoted. Where it is reasonable and practicable to do so, it will take steps to address identified inequalities or barriers that may arise.

Guided Learning Hours (GLH) which are listed in each unit gives centres the number of hours of teacher-supervised or direct study time likely to be required to teach that unit.

ASSESSMENT AND VERIFICATION

All units within this qualification are internally assessed by the centre and externally verified by OTHM. The qualifications are criterion referenced, based on the achievement of all the specified learning outcomes.

Specific assessment guidance and relevant marking criteria for each unit are made available in the Assignment Brief document. These are made available to centres immediately after registration of one or more learners

To achieve a 'pass' for a unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria. Judgement that the learners have successfully fulfilled the assessment criteria is made by the Assessor.

The Assessor should provide an audit trail showing how the judgement of the learners' overall achievement has been arrived at.

OPPORTUNITIES FOR LEARNERS TO PASS

Centres are responsible for managing learners who have not achieved a Pass for the qualification having completed the assessment. However, OTHM expects at a minimum, that centres must have in place a clear feedback mechanism to learners by which they can effectively retrain the learner in all the areas required before re-assessing the learner.

RECOGNITION OF PRIOR LEARNING AND ACHIEVEMENT

Recognition of Prior Learning (RPL) is a method of assessment that considers whether learners can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and do not need to develop through a course of learning.

RPL policies and procedures have been developed over time, which has led to the use of a number of terms to describe the process. Among the most common are:
● Accreditation of Prior Learning (APL)
● Accreditation of Prior Experiential Learning (APEL)
● Accreditation of Prior Achievement (APA)
● Accreditation of Prior Learning and Achievement (APLA)

All evidence must be evaluated with reference to the stipulated learning outcomes and assessment criteria against the respective unit(s). The assessor must be satisfied that the evidence produced by the learner meets the assessment standard established by the learning outcome and its related assessment criteria at that particular level.

Most often RPL will be used for units. It is not acceptable to claim for an entire qualification through RPL. Where evidence is assessed to be only sufficient to cover one or more learning outcomes, or to partly meet the need of a learning outcome, then additional assessment methods should be used to generate sufficient evidence to be able to award the learning outcome(s) for the whole unit. This may include a combination of units where applicable.

EQUALITY AND DIVERSITY

OTHM provides equality and diversity training to staff and consultants. This makes clear that staff and consultants must comply with the requirements of the Equality Act 2010, and all other related equality and diversity legislation, in relation to our qualifications.

We develop and revise our qualifications to avoid, where possible, any feature that might disadvantage learners because of their age, disability, gender, pregnancy or maternity, race, religion or belief, and sexual orientation.

If a specific qualification requires a feature that might disadvantage a particular group (e.g. a legal requirement regarding health and safety in the workplace), we will clarify this explicitly in the qualification specification.

UNIT SPECIFICATIONS

CYBER SECURITY

Unit Reference Number	D/650/3383
Unit Title	Cyber Security
Unit Level	4
Number of Credits	20
Total Qualification Time (TQT)	200 hours
Guided Learning Hours (GLH)	80 hours
Mandatory / Optional	Mandatory
SSAs	6.1 ICT practitioners
Unit Grading Structure	Pass/Fail

Unit Aims

In this unit, learners will learn the fundamentals of cyber security, including its historical development, laws and regulations, risk management and the impact it has on individuals and organisations. Learners will also gain knowledge and understanding about cyber security protection methods and how to manage a cyber security attack.

Learning Outcomes, Assessment Criteria and Indicative Content

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content

1. Understand the fundamentals of cyber security.	1.1 Define the term 'cyber security'.
	1.2 Explain how cyber security risks are managed in an organisation.
	1.3 Describe the laws and regulations associated with cyber security
	1.4 Summarise the historical development of cyber security.
	1.5 Explain the impact cyber security has on individuals and organisations.
	1.6 Explain how to keep up to date with the latest cyber security information.
		● Definition: the application of technologies, processes, and controls to protect systems, networks, programs, devices and data from cyber-attacks,
		● Aims: reduce the risk of cyber-attacks and protect against the unauthorised exploitation of systems, networks, and technologies.
		● Risk management
		  ○ Physical and virtual controls
		  ○ Processes
		  ○ Procedures
		  ○ Policies
		  ○ Risk Management

		- o Incident Management - o Frameworks - Laws and regulations - o General Data Protection Regulation (EU) (GDPR) - o Information Commissioner's Office (ICO) Purpose and Responsibilities - o Information Security Act - o Telecommunications Security Act - Historical development - o Increase in use of cloud technologies and platforms - o Increase of cyber-attacks in line with increased use in digital technologies - Impact - o Financial - o Reputational - o Operational - Updates - o ISACA - o National Cyber Security Centre Newsletters - o Joining security groups online - o Research - o Networking
2. Understand cyber security protection methods.	2.1 Describe network security protection methods. 2.2 Evaluate the impact of penetration and vulnerability testing has to an organisation. 2.3 Describe end user device protection methods. 2.4 Describe the importance of implementing and reviewing access controls in an organisation. 2.5 Explain how end users can be educated and aware of cyber security.	- Network security protection methods - o Firewalls - o VPN - o Access logs - o Firmware updates - Impact - o Baselines - o Assurance - o Identifies areas of weakness or focus - o Ethical hacking - o Externally vs internally completed

		tests
		● End user device protection methods.
		   ○ Anti-virus protection
		   ○ Patch management
		   ○ Malware protection
		   ○ End-point protection
		   ○ Mobile Device Management
		● Implementation and review
		   ○ Increased security
		   ○ Identify weaknesses
		   ○ Identify areas of focus
		● Education
		   ○ Cyber security awareness training
		   ○ Speaking about cyber security at company events
		   ○ Company updates on number of incidents
		   ○ Internal promotion via posters, email reminders etc
		   ○ Phishing simulations

3. Understand how to manage a cyber security attack.	3.1 Evaluate the impact a cyber-attack has to an organisation.
	3.2 Describe the content of an organisational incident management plan.
	3.3 Explain the importance of internal and external communication when managing a cyber-attack.
	3.4 Describe the roles and responsibilities for incident management.
	3.5 Analyse the actions to take when responding to an incident.
	3.6 Explain the importance of post cyber-attack reviews.
		● Impact on organisations
		   ○ Financial loss
		   ○ Reputation damage
		   ○ Fines
		   ○ Incident management
		● Organisational incident management plan
		   ○ Notification procedure
		   ○ Incident Management Team
		   ○ Responsibilities
		   ○ Timescales
		   ○ Incident classification
		   ○ Process
		● Communication
		   ○ Stakeholder management
		   ○ Media engagement
		   ○ Damage mitigation

		o Reduce risk of re-occurrence
		● Roles and responsibilities
		o Support teams
		o Consultants
		o Incident Management Team
		o ICT security teams
		o Senior Management Team
		o Suppliers
		o Third Parties
		● Evaluation
		o Steps involved
		o Who is involved?
		o How an incident is managed and documented
		o Mitigation methods
		● Reviews
		o Root cause analysis
		o Learning
		o Areas for improvement

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO2, LO3	All ACs under LO1, LO2, LO3	Coursework	2500 words

Indicative Reading List

Ozkaya E (2019) *Cybersecurity: The Beginner's Guide*. Packt Publishing

Amoroso, E. and Amoroso, M. (2017) *From CIA to APT: An Introduction to Cyber Security*. New York: Independently published.

Gillespie, A. A. (2015) *Cybercrime.* Oxon: Routledge.

Grabosky, G. (2015) *Cybercrime* (Keynotes Criminology Criminal Justice series). New York: Oxford University Press.

Additional Resources

National Cyber Security Centre https://www.ncsc.gov.uk/

IT Governance https://www.itgovernance.co.uk/

National Crime Agency (crime threats, cybercrime) https://nationalcrimeagency.gov.uk/

Interpol crime areas, cybercrime https://www.interpol.int/

PRINCIPLES OF COMPUTER PROGRAMMING

Unit Reference Number	F/650/3384
Unit Title	Principles of Computer Programming
Unit Level	4
Number of Credits	20
Total Qualification Time (TQT)	200 hours
Guided Learning Hours (GLH)	80 hours
Mandatory / Optional	Mandatory
SSAs	6.1 ICT practitioners
Unit Grading Structure	Pass/Fail

Unit Aims

The aim of this unit is to give learners a basic understanding of object-oriented programming languages and how to produce effective code. It also enables learners to gain a perspective of software development and the basic principles of algorithms.

Learning Outcomes, Assessment Criteria and Indicative Content

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content

1. Understand the principles of computer programming.	1.1 Describe the benefits of computer programming in society and in business.
	1.2 Describe the principles of computer programming.
	1.3 Summarise the historical development of computer programming.
	1.4 Explain the fundamental components of a programming language.
	1.5 Compare the strengths and limitations of modern computer programming languages.
		• Benefits
		  o Solve problems
		  o Automate tasks
		• Sectors
		  o Healthcare
		  o Education
		  o Manufacturing
		  o Transport
		• Definition, principles of programming
		  o Abstraction
		  o KISS
		  o Open/Closed entities
		  o Coupling
		  o Cohesion

		- Programming history - Charles Babbage's Analytical Engine - the concept of storing data in machine-readable form - low & high-level languages (COBOL, FORTRAN, and Lisp) - Moore's law - Procedural - OO Languages - COBOL, FORTRAN, Java, JavaScript, C#, C++, Python, PHP, Ruby on Rails) - The main () Function - The #include and #define directives - The Variable Definition - The Function Prototype - Program Statements - The Function Definition - Program Comments - SQL, Java, JavaScript, C#, C++, Python, PHP, Ruby on Rails. - Compare; use, error handling, ease of use.
2. Understand the principles of algorithms.	2.1 Explain the concept of an algorithm. 2.2 Describe common algorithmic techniques and solutions. 2.3 Demonstrate how to create a flowchart from an algorithm.	- History of Algorithms. - Definition of algorithms - Input - Output - Definiteness - Finiteness - Effectiveness - Brute Force - Greedy Algorithms: "take what you can get now" strategy - Divide-and-Conquer - Decrease-and-Conquer - Dynamic Programming

		o Transform-and-Conquer
		● Flowchart
		   o Backtracking and branch-and-bound generate and test methods.
		   o Flowchart symbols.
		   o Information flow
		   o Purpose and benefits

3. Understand the object-oriented Programming language.	3.1 Explain the benefits of object-oriented design.
	3.2 Evaluate when to use object-oriented design methodology.
	3.3 Explain how objects are used in object-oriented programming.
	3.4 Explain the steps in creating an object-oriented program.
	3.5 Explain how to compile a program and debug codes.
		● Benefits
		   o Code Reuse and Recycling
		   o Encapsulation
		   o Design Benefits
		   o Software Maintenance
		● Evaluate
		   o Situation
		   o Volume of code
		   o Multiple workstreams
		   o Project size
		   o Change cycle
		● Use
		   o Classes and objects
		   o Arrays
		   o Lists
		   o Stacks
		   o Queues
		   o Trees
		● Steps
		   o Intermediate representations and their purpose.
		   o Arrays (1- and 2-dimensions)
		   o Implementation of queues
		   o Stacks and lists
		● Compile and debug codes
		   o Debugger
		   o Breakpoints
		   o commands
		   o Use of IDEs and the IDE

		environments (benefits and examples of IDEs) ○ data structure display/verification ○ Use of debugging tools

4. Understand the tools and techniques used for software development.	4.1 Explain different types of software development techniques.
	4.2 Evaluate the use of different software development tools.
	4.3 Evaluate software testing methodologies.
	4.4 Describe software deployment techniques.
	4.5 Evaluate methods of reviewing system performance.
		● Different software development tools
		● Research and consider possible solutions and predict the overall success of the application.
		● Research and use information relating to software testing to create a suitable test plan for your business application.
		● Methods of reviewing system performance.
		  ○ Focus group
		  ○ Testing
		  ○ User feedback
		  ○ Reviews

5. Be able to create a software programme to solve a problem using object-oriented programming.	5.1 Identify a problem which can be solved using object-oriented programming. 5.2 Create a flowchart to illustrate the problem and solution. 5.3 Create a defined user requirements document. 5.4 Produce a software development plan from a system design. 5.5 Develop and deploy a software solution to solve a problem. 5.6 Evaluate the software against business and user requirements.	● Clear problem and resolution ● Solution will be focused on object-oriented programming solution ● Mapping of solution into a flowchart ● Information flow ● Symbols ● Number reference ● Defined requirements ● Business need ● Evaluation methods ● Goals ● Timescales and deadlines ● Resources and requirements ● Constraints and risks ● Business process ● Design using either SQL, Java, JavaScript, C#, C++, Python, PHP, Ruby on Rails. ● Code writing standards, comments, documentation ● Use Debugger, breakpoints, commands in

		the chosen language, C ++/JAVA/Python/or similar an OOPL.
		● Key components of an Integrated Development Environment (IDE)
		● Use of IDEs, test plan
		● Test plan referenced to use requirements, expected result and end result

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO2, LO3, LO4	All ACs under LO1, LO2, LO3, LO4	Coursework	2500 words
LO5	All ACs under LO5	Project	N/A

Indicative Reading List

Harper R (2016) *Practical Foundations for Programming Languages*. New York Cambridge University Press

Stroustrup B (2013) *The C++ Programming Language*. Michigan. Pearson.

Robert M (2018) *Python Programming: An Easy Guide to Learn Python Programming*. Python.

Dooley J F (2017) *Language for Absolute Beginners - by Software Development, Design and Coding: With Patterns, Debugging, Unit Testing, and Refactoring*. APress.

Richard Murch R *The Software Development Lifecycle - A Complete Guide*

Dooley J F (2017) *Software Development, Design and Coding: With Patterns, Debugging, Unit Testing, and Refactoring*. A Press.

SYSTEMS ANALYSIS AND DESIGN

Unit Reference Number	F/617/2266
Unit Title	Systems Analysis and Design
Unit Level	4
Number of Credits	20
Total Qualification Time (TQT)	200 hours
Guided Learning Hours (GLH)	80 hours
Mandatory / Optional	Mandatory
SSAs	6.1 ICT practitioners
Unit Grading Structure	Pass/Fail

Unit Aims

The aim of this unit is to develop learners' awareness of system analysis and design in an organisational context. The unit introduces various techniques used within systems analysis and design and the methodologies used in the system development process.

Learning Outcomes, Assessment Criteria and Indicative Content

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Understand the principles of systems analysis and design.	1.1 Explain how systems analysis and design contributes to the software development life cycle. 1.2 Describe the components of systems analysis. 1.3 Analyse different approaches to system analysis and design. 1.4 Evaluate system design requirements. 1.5 Explain the importance of each stage in traditional software lifecycle approaches. 1.6 Evaluate software development lifecycle models. 1.7 Explain hard and soft system methodologies.	• Basic definitions and motivations of HCI, including history, theories, interaction paradigms, design principles and models. • User centred design methods comprising user studies • Input • Processing • Output • Design approaches for interfaces and interaction • Quality factors • Evaluation methods • Techniques for data analysis. • Research frontiers of HCI, including

		• accessibility, universal design, and pervasive computing (ubiquitous, mobile and wearable applications). • Lifecycle stage and connectivity: feasibility study, analysis, design, implementation, testing, review or analysis, design, implementation, maintenance, planning; requirements traceability. • Lifecycle models: understanding and use of predictive (Waterfall, Prototyping, RAD) and adaptive (Spiral, Agile, DSDM) software development models. • Test and integration: building test environments; developing test harnesses; black box/white box testing; incremental testing; acceptance test and integration approaches; changeover strategies, trials and Go-Live prerequisites. • Prototyping methodology • End user categorisations, classifications and behaviour modelling techniques. • Agile, Cleanroom, Incremental, Prototyping, Spiral V model, Waterfall. • Hard and soft system methodologies in Object-oriented modelling.
2. Understand system design methodologies and modelling.	2.1 Explain types of information systems. 2.2 Evaluate how the functionality of information systems varies between different information systems. 2.3 Explain system design concepts. 2.4 Evaluate different system design methodologies.	• Information system types: Business information systems, decision support systems, management information systems, strategic/executive information systems, office information systems, transaction processing systems, expert systems, global information systems, data warehouse systems, enterprise systems, enterprise resource planning systems, integrated information systems. • Categories of information systems:

		operational, tactical and strategic information systems
		• Agile development methodology.
		• DevOps deployment methodology
		• Waterfall development method
		• Rapid application development
3. Understand human computer interface (HCI).	3.1 Explain the principles of HCI. 3.2 Explain how HCI improves the user experience of a system 3.3 Explain the considerations to make in relation to HCI when designing a system 3.4 Evaluate HCI methodologies.	• Definition of information and data, sources of information, information requirements and the needs for information at different levels within an organisation; storing information and its importance regarding security, accuracy and relevance; outputs e.g., payroll, invoicing, ordering, bookings, stock control, personnel records, goods tracking, decision-making, marketing, customer service. • Management information: Reports e.g., sales report, college enrolment statistics, marketing analysis (brick v click), trends in the market, competition and market share, - management of computer systems, staffing, maintenance, project management and scheduling. • Selecting information: Analysis of information in terms of validity, accuracy, currency and relevancy; identifying and rationalising meaningful information from data sets. • Uses: Proficiency in terms of accessing quality information that can be used for decision-making, problem-solving, predictions, trending and forecasting. • Accessibility • Functionality • Useability

		- Icons - Colours - Layout - Speed - Security - Flowcharts; Pseudocode; Formal specification Methods; Event/State/Data Driven; Finite State. Machines (extended-FSM)/FSP; problem of e-FSM state explosion; reachability analysis. - Docker, CoreOS, Cloud Foundry, Kubernetes and OpenStack. - DevOps and continuous integration practices, as well as the deployment tools available to architects to meet and exceed their business goals.
4. Be able to produce a system design using modelling techniques.	4.1 Create a system design document. 4.2 Produce a model of a software system. 4.3 Produce a security and control design.	- System design document : purpose, design ideas, aim, audience - Software Determinations : The usefulness of the product and imperatives on its activity should be characterized. - Software Turn Of Events : The product to meet the prerequisite should be created. - Software Approval : The product should be approved to guarantee that it does what the client needs. - Software Development : The product should advance to meet changing customer needs. - The model should illustrate how a real-life system would work

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO2, LO3	All ACs under LO1, LO2, LO3	Coursework	2500 words
LO4	All ACs under LO4	Project	N/A

Indicative Reading list

J., Preece, J., Rogers, Y., & Sharp, H. (2015) *Interaction design: Beyond human-computer interaction* (4th ed.) Bentham. London.

Fix, A., Finlay, J., Abowd, G.D., & Beale, R (2004) *Human computer interaction* (3rd ed.) Pearson. London.

Ahmed T; Cox J; (2014) *Developing Information Systems: Practical Guidance for IT Professionals* BCS Learning & Development

Bocij P; Greasley A; Hickie S; (2015) *Business Information Systems*, 5th edn: Technology, Development and Management for the E-Business. Pearson. London.

WEB AND MOBILE APPLICATIONS

Unit Reference Number	H/650/3385
Unit Title	Web and Mobile Applications
Unit Level	4
Number of Credits	20
Total Qualification Time (TQT)	200 hours
Guided Learning Hours (GLH)	80 hours
Mandatory / Optional	Mandatory
SSAs	6.1 ICT practitioners
Unit Grading Structure	Pass/Fail

Unit Aims

The aim of this unit is to provide learners with an understanding of current web and mobile application design technology and the practices and tools used. The learner will learn to create websites or mobile applications to given design specifications.

Learning Outcomes, Assessment Criteria and Indicative Content

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Understand web and mobile application design technology.	1.1 Explain modern web and mobile development technologies and frameworks. 1.2 Evaluate the impact of common development technologies and frameworks on design, functionality and management. 1.3 Review the impact of website design on search engine results. 1.4 Explain how to improve website ranking using search engine optimization (SEO) techniques.	• Hosting and website management: Investigate relationships between domain names, DNS services and communication protocols used to access a website. • Overview of publishing and managing secure websites, including search engine indexing and ranking. • Development of mobile applications in an IDE environment • Evolution of mobile applications • Mobile application stores including Apple App store and Google Play store • Interaction between browser and server:

		HTML forms, GET and POST data
		• Different server technologies: Differences between web server hardware, software and host operating systems. • Advantages of an integrated database system with regards to expanding website capability. • Common web development technologies and frameworks. • Aesthetics • Speed • Databases • Integrations and API dependencies SEO techniques • Backlinks • URL • Speed • Search engine algorithms • Keywords • Page scores • Paid advertising • Future developments and advancements:
2. Understand website technologies, tools and software used to develop websites.	2.1 Explain the concepts of design flexibility, performance, functionality, User Experience (UX) and User Interface (UI). 2.2 Evaluate a range of tools, techniques and languages used to design and develop a custom-built website. 2.3 Evaluate the use of a content management system (CMS) for designing and managing a website. 2.4 Explain the considerations, limitations and benefits of website design platforms .	• Developing schemes of user interaction influenced by characteristics of good design, such as: learnability, robustness, flexibility, usability, performance, accessibility, adaptability, customisation • Developing dynamic content using PHP (The use of JSP, ASP or Perl is acceptable): Interfacing with a database (limited knowledge of SQL syntax is required to allow iterating over a data set)

		• Joomla, WordPress, Drupal, etc. • Standards & conformance: W3C, WAI, CSS. • Public & Private key encryption, On the fly encryption, hashes, the uses and limitations of RSA, DES and AES. • ISO 9126 characteristics of quality. • File sharing & distribution mechanisms: Traditional downloading/uploading, FTP, Bit torrent, P2P networks. • Streaming media, RSS, IRC, Wiki, Blog, Web Forum, Portals.
3. Understand multimedia content creation tools and software.	3.1 Describe tools available to create multimedia content for websites. 3.2 Explain regulatory and ethical considerations in creating multimedia content for websites.	• InDesign, Adobe Illustrator, Photoshop, Dreamweaver & CorelDRAW. • Lab hours demonstrating InDesign, Adobe Illustrator, Photoshop, Dreamweaver & CorelDRAW use. • CMS such as WordPress • IDE's such as Xcode and Android Studio • Disability Discrimination Act 1995 (DDA) and the related Special Educational Needs and Disability Act 2001 (SENDA) • Web Accessibility Initiative (WAI) from the World Wide Web Consortium (W3C)

4. Be able to create a website or mobile application to fulfil a set of client and user requirements.	4.1 Design a wireframe document for a website or mobile application to fulfil a set of client and user requirements.
	4.2 Create a website or mobile application to fulfil a set of client and user requirements.
	4.3 Identify key performance areas and create a suitable test plan of your website or mobile application.
	4.4 Evaluate the results of the test plan and overall success of your multipage website or mobile application.
		• Website wireframe is a visual representation or outline of a website.
		• Creation of website / mobile application
		• Website should include:
		  o Navigation / menu
		  o Pages
		  o Accessibility
		• Review how intuitive interfaces and actions, user-friendly designs, appropriate graphics, effective navigation and good quality content can

		help establish user trust and deliver an improved User Experience (UX). ● Evaluate: explain any areas of success and provide justified recommendations for areas that require improvement

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of Assessment	Summary of quantity/quality
LO1, LO2, LO3	All ACs under LO1, LO2, LO3	Coursework	2500 words
LO4	All ACs under LO4	Project	NA

Indicative Reading List

HTML and CSS: Design and Build Websites Paperback by Jon Duckett (Author)

Responsive Web Design with HTML5 and CSS3 - Second Edition: Build responsive and future-proof websites to meet the demands of modern web users by Ben Frain

Adobe Photoshop CC Classroom in a Book (2018 release) (Classroom in a Book (Adobe)) by Andrew Faulkner and Conrad Chavez

Additional Resources

Android Studio http://developer.android.com

Apple Xcode http://developer.apple.com

COMPUTER AND NETWORK TECHNOLOGY

Unit Reference Number	L/617/2268
Unit Title	Computer and Network Technology
Unit Level	4
Number of Credits	20
Total Qualification Time (TQT)	200 hours
Guided Learning Hours (GLH)	80 hours
Mandatory / Optional	Mandatory
SSAs	6.1 ICT practitioners
Unit Grading Structure	Pass/Fail

Unit Aims

This unit provides learners with an understanding of computer networking essentials and cloud technologies, their operating principles, protocols, standards, security considerations, and prototypes associated with this field. Learners will explore different hardware and software options as well as how to configure and install them.

A wide range of networking technologies will be also examined including Local Area Networks (LAN) and Wide Area Networks (WAN) and how they evolved to create large-scale networks. Protocol methodologies related to IP data networks will also be explored.

Learning Outcomes, Assessment Criteria and Indicative Content

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Understand the fundamentals of cloud computing.	1.1 Summarise the historical development of cloud computing technologies. 1.2 Evaluate cloud computing models. 1.3 Assess cloud computing platforms. 1.4 Differentiate client and server environments. 1.5 Evaluate the benefits of serverless computing.	• Cloud technologies and platforms such as Cloud Applications and Cloud Infrastructure • Increase in use of cloud technology • Benefits of cloud computing • Models: SaaS, PaaS, IaaS, NaaS • Benefits • Cost considerations • Configurations • Hybrid solutions • Difference in needs

		• Difference in costs • Difference in functionality • Azure • Amazon web services • Reduced need for physical infrastructure • Cost reduction in areas such as electric • Speed of implementation • Accessibility • Integrations • Saleability • Availability
2. Understand networking principles and their protocols.	2.1 Describe network standards and protocols. 2.2 Assess different network topologies. 2.3 Evaluate the impact of different network standards. 2.4 Identify and explain various network hardware and software available for an intranet setup.	• Topology: Logical e.g., Ethernet, Token Ring; physical e.g., star, ring, bus, mesh, tree, ring. • Protocols: Purpose of protocols; routed protocols e.g., IPv4, IPv6, IPv6 addressing, Global unicast, Multicast, Link local, Unique local, EUI 64, Auto configuration, FTP, HTTP, SMTP, POP3, SSL; management of protocols for addressing. • Network layer • Physical layer • Data layer • Transport layer • Switches • Routers • Gateways • Firewalls • Network storage • Servers • Virtual server management systems
3. Be able to support and troubleshoot computing problems.	3.1 Carry out PC assembling and basic troubleshooting without supervision.	• Basic Numbering Systems • Networking Fundamentals • Transmission Media and Networking

	3.2 Carry out installation of client and server operating systems without supervision. 3.3 Configure client systems to meet organisational policies without supervision.	Topologies • Network Reference Models • Networking Protocols • 3.2Physical installation including hardware i.e., RAM, Hard Drives etc • Software installation with operating system setup and configuration • Access controls • Restrictions • Group policies • Reviewing default settings
4. Be able to demonstrate routing and switching techniques.	4.1 Configure a network using routing and switching techniques. 4.2 Demonstrate how to setup a secure network interface. 4.3 Explain how to backup and restore a router.	• Transmission Media and Networking Topologies. • Networking Protocols. • IP Addressing. • Subnetting. • Variable Length Subnet Mask (VLSM). • Basic Router Configuration. • Router Boot Sequence. • IP Routing. • Cloud network such as Azure • Virtual Local Area Network (VLAN). • Inter-VLAN Routing and VLAN Trunking Protocol. • Enabling Network Security. • Access list, Extended Access List, Named Access. List. • IPv6 Routing Protocols. • Back Up and Restoring of Router Configuration. • Managing Switches.

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO2	All ACs under LO1, LO2	Coursework	2500 words
LO3, LO4	All ACs under LO3, LO4	Project	NA

Indicative Reading List

Wempen F (2014) *Computing Fundamentals.* Willy. London

Tanenbaum A S; Wetherall J (2010) *Computer Networks and Internets.* Pearson. London.

Orban, S (2018) *Ahead in the Cloud: Best Practices for Navigating the Future of Enterprise IT.* CreateSpace Independent Publishing Platform

MANAGING DIGITAL INFORMATION

Unit Reference Number	J/650/3386
Unit Title	Managing Digital Information
Unit Level	4
Number of Credits	20
Total Qualification Time (TQT)	200 hours
Guided Learning Hours (GLH)	80 hours
Mandatory / Optional	Mandatory
SSAs	6.1 ICT practitioners
Unit Grading Structure	Pass/Fail

Unit Aims

The aim of this unit is to show how communications, knowledge and information can be improved within an organisation including making better use of IT systems. Learners will understand the interaction between communications, knowledge and information. The unit also explores how IT systems can be used as a management tool for collecting, storing, disseminating and providing access to knowledge and information.

Learning Outcomes, Assessment Criteria and Indicative Content

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Understand how to assess the digital information needs of an organisation.	1.1 Assess various digital information held by organisations. 1.2 Evaluate the information systems used for managing digital information 1.3 Assess internal and external sources of digital information.	• Sources: internal and external, primary and secondary, formal and informal, team workers, customers and other stakeholders. • Types: qualitative and quantitative, tacit and explicit, official and unofficial, policy and opinion. • Software systems • Non digital systems • Stakeholders • Information flows • Information asset register • Third parties

2. Understand information processes in an organisation.	2.1 Describe existing information processes for a given department within an organisation. 2.2 Design a process map. 2.3 Determine benefits and limitations of existing processes. 2.4 Justify areas of improvement for processes in any areas of a business.	• Information flow • Documents used • Linked processes • Types: meetings and conferences, workshops and training events, internet and email, written, telephone, video conferencing, one-to-one meetings. • Flow of data • Symbols • Related documents referenced • Reliance of human processing • Errors • Bottlenecks • Ease of use • Duplication of work • Clear justification of decisions based on evidence and facts • Approaches: structured and coordinated, planned, formal and informal. • Strategy: advantages, disadvantages; informal, face-to-face, formal in writing, emotional, intelligence. • Mapping of current process to new process • Identifying areas for improvement or automation • Reducing human error
3. Understand compliance and regulations associated with digital information.	3.1 Explain the laws and regulations associated with managing digital information. 3.2 Assess how to ensure organisations are complaint when managing digital information. 3.3 Explain the impact of being non complaint with laws and regulations.	• o General Data Protection Regulation (EU) (GDPR) • Fees from o Information Commissioner's Office(ICO) • Compliance and regulations when managing digital information such as GDPR and how long digital data can be kept for (retention periods) • How to manage the retention of digital information,

		• An awareness of current national and international legislation including Data Protection Act 2018 , Computer Misuse Act 1990, equal opportunities, health and safety. • Current approaches to tendering; copyright and licensing issues. • Approaches to capturing information inside an organisation and its purpose i.e., information asset register, records of processing activities • Financial • Reputational • Data breaches
4. Be able to improve digital information systems for an organisation.	4.1 Explain existing approaches to the collection, formatting, storage and dissemination of information and knowledge in an organisation. 4.2 Recommend a strategy to improve the collection, formatting, storage and dissemination of information and knowledge. 4.3 Implement an improvement to access of information and knowledge in an organisation.	• Type: hard and soft, websites and mailings, access and dissemination. • Style: trends and patterns, diagrams and text, consistent and reliable, current and valid; legal and confidential. ○ Who ○ What ○ Where ○ When ○ Why • SMART Goals • Analyse current solution • Recommend solution with justification

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO2, LO3, LO4	All ACs under LO1, LO2, LO3, LO4	Coursework	2500 words

Indicative Reading List

McNurlin, Sprague & Bui (2009) *Information Systems Management in Practice*. Pearson. London.

Bott M. F. (2014) *Professional Issues in Information Technology*. CBS. London.

Additional Resources

Information Commissioners Office (ICO) https://ico.org.uk
The UK's independent authority set up to uphold information rights in the public interest, promoting openness by public bodies and data privacy for individuals.

SOFTWARE ENGINEERING

Unit Reference Number	K/617/2276

Unit Title	Software Engineering
Unit Level	5
Number of Credits	20
Total Qualification Time	200 hours
Mandatory / Optional	Mandatory
SSAs	06.1 ICT practitioners
Unit Grading Structure	Pass / Fail

Unit Aims

The aim of this unit is to give learners an understanding of software development and its evolution as an engineering discipline, and to develop, maintain, and evolve software systems of high quality.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Understand modelling languages and their benefits.	1.1 Describe different modelling languages 1.2 Explain the benefit of using modelling languages in system design	● UML ● XML ● Quality, code reuse, flexibility, modularisation.
2. Be able to design and implement a series of UML class diagrams.	2.1 Design and build class diagrams using a UML tool. 2.2 Define/refine class diagrams derived from a given code scenario using a UML tool. 2.3 Build an application derived from UML class diagrams.	● Tools to develop class diagrams based on a business requirement. ● Developing code based on class diagrams. ● Using appropriate language & IDE.
3. Understand the management of software testing using different strategies.	3.1 Evaluate how software testing differs for different strategies. 3.2 Describe the stages of system testing 3.3 Evaluate different software testing tools available for the automation of the testing process.	● Test strategies, analytical, model based, methodical, process-oriented, dynamic, White-box, Black-box, etc. ● Testing phases, alpha, beta, acceptance ● Bugzilla, LoadRunner, Jira etc.

4. Be able to develop a solution using object-oriented programming.	4.1 Develop software using a variety of constructs. 4.2 Apply collections and generics in developing software. 4.3 Apply different testing techniques to validate code.	● Developing an OO program to meet a business requirement. ● Including collections and generics in developed code. ● Testing and documenting the OO program developed.

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO3	All ACs under LO1 and LO3	Coursework	2000 words
LO2, LO4	All ACs in LO2 and LO4	Practical/Lab Demonstration	NA

Indicative Reading list

Stevens P (2005) *Using UML: Software Engineering with Objects and Components (Object Technology Series)* (2nd Ed) Addison Wesley

Unhelkar, B. (2017). *Software Engineering with UML,* (1st Ed), Auerbach Publications, Milton.

Deitel, P. & Deitel, H. (2016). *Visual C# How to Program*, 6th edn, Pearson.

Tarlinder, A. (2016), *Developer Testing: Building Quality into Software*. (1st Ed). Addison-Wesley Professional.

DATABASE SYSTEMS

Unit Reference Number	H/617/2275
Unit Title	Database Systems
Unit Level	5

Number of Credits	20
Total Qualification Time	200 hours
Mandatory / Optional	Mandatory
SSAs	06.1 ICT practitioners
Unit Grading Structure	Pass / Fail

Unit Aims

The aim of this unit is to provide learners with knowledge in database systems development and enable them to develop strong database design and development skills.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Understand basic concepts of database systems.	1.1 Describe the concept of normalisation in the storage of data. 1.2 Explain different 'Normal forms'. 1.3 Explain data and functional dependencies. 1.4 Compare and contrast the 'hierarchical' and the 'relational' database management system. 1.5 Explain the use of entity relationship diagrams.	● tables, relationships, rules 1NF, 2NF, 3NF, BCNF ● data relationships, trivial functional dependencies, full functional dependencies, transitive dependencies, multivalued dependencies. ● design, marry-to-one vs marry-to-many, flexibility, structure. ● benefits, limitations, conceptual/logical/physical data models, entities & attributes.
2. Be able to design and develop a fully functional relational database system to meet a business need.	2.1 Produce a comprehensive design using E-R Modelling for a fully functional system. 2.2 Design a 'Relational Database System' using appropriate design tools and techniques. 2.3 Design and run queries on the database. 2.4 Integrate system security and constraints for a database system.	● Database design including; interface and output designs, data validations and data normalisation. ● Systems containing at least six interrelated tables, with clear statements of user and system requirements. ● Queries to include validate data, input and

		- output data, queries to run across multiple tables and use functions and formulas. - Implementation of security elements in databases. - Controls such as data validation using; input masks, drop down lists, option buttons.
3. Be able to test database systems and produce required documentation.	3.1 Test the system against user and system requirements. 3.2 Use query tools to produce business reports. 3.3 Produce technical and user documentation for a system. 3.4 Recommend improvements that may be required to ensure the continued effectiveness of the database system.	- Creating and implementing a test plan - Identifying elements of the system that need to be tested. - Considering data that should be used to fully test the system. - Matching tests against user and system requirements. - Identifying test procedures to be used: test plans, test models e.g., white box, black box. - Testing documentation. - Creating queries to produce system reports using report writing tools and report generators, dashboards.

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)

LO1	All ACs under LO1	Coursework	750 words
LO2, LO3	All ACs under LO2 and LO3	Coursework and Practical/Lab works	

Indicative Reading list

Coronel, C., & Morris, S. (2018). *Database systems: design, implementation, and management.* Boston, MA, USA: Cengage Learning.

Elmasri, R., Navathe, S., & Elmasri, R. (2011). *Database systems: models, languages, design, and application programming*. Boston, MA: Pearson.

ADVANCED SYSTEMS ANALYSIS & DESIGN

Unit Reference Number	D/617/2274
Unit Title	Advanced Systems Analysis & Design
Unit Level	5
Number of Credits	20
Total Qualification Time	200 hours
Mandatory / Optional	Mandatory
SSAs	06.1 ICT practitioners
Unit Grading Structure	Pass / Fail

Unit Aims

The aim of this unit is to provide learners with a deep understanding of the activities of the systems analyst and systems designer, and to be able to apply some current techniques.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Understand the role of system analysis and design in an organisation.	● Explain the different organisational roles involved in system analysis and design and how they interact. ● Explain how to analyse business requirements for system design. ● Evaluate system analysis and design methodologies used in an organisation.	● Business Analyst, System Architects, System Analysts. ● Stakeholders (identification, requirements), sign-off. ● Atern/DSDM Dynamic Systems Design Method, and XP eXtreme Programming.
2. Understand the steps needed in system analysis and design.	2.1 Describe approaches to gathering system requirements. 2.2 Explain prototyping techniques. 2.3 Explain how use-cases and scenarios are used within system design.	● Prioritisation, function, quality, gap analysis, business activity modelling. ● Horizontal and vertical prototyping. Throwaway, Evolutionary, Incremental and Extreme prototyping. ● Actors, visual modelling, etc.

	2.4	Explain the use of top-down and bottom-up methodologies in relation to 'Systems Integration'	● Requirements, components.
3. Be able to create documented system requirements.	3.1	Evaluate the impact of hardware and software systems, technologies, platforms and services on system design.	● Research and evaluate hardware and software servers, technologies, platforms and services.
	3.2	Apply methods of investigation to determine system requirements.	● Connecting systems and subsystems, including custom software services and development.
	3.3	Use a structured method and notation to describe system requirements.	● Documenting functional and non-functional requirements, user requirements, technical requirements for a business system.
			● Documenting the system requirements of a business requirement using a suitable notation method, such as UML.
4. Be able to develop functional and data models for a software system.	4.1	Produce functional and data models to reflect the different levels of the design process.	● Documenting the development of data models during the development of a system to meet business requirements.
	4.2	Document the benefits and limitations of a system design.	● Evaluating and documenting the benefits and the limitations of the system design.

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO2, LO3, LO4	All ACs under LO1, LO2, LO3, LO4	Coursework and	2000 words
LO3, LO4	LO3, LO4	Lab Demonstration	

Indicative Reading list

Yeates D; Wakefield T (2003) *Systems Analysis and Design*. Prentice Hall. London

MANAGEMENT INFORMATION SYSTEMS

Unit Reference Number	Y/617/2273
Unit Title	Management Information Systems
Unit Level	5
Number of Credits	20
Total Qualification Time	200 hours
Core / Option	Mandatory
SSAs	06.1 ICT practitioners
Unit Grading Structure	Pass / Fail

Unit Aims

The aim of this unit is to give learners an understanding of how an organisation uses information to design, implement, maintain and manage secure information systems to support its operations. This unit examines how systems can be used to support core business functions and enable organisations to be more productive and competitive within the global marketplace.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Understand the information system requirements of organisations.	1.1 Determine the inputs, outputs and processing activities of an organisation. 1.2 Explain different information systems and their functions in an organisation. 1.3 Analyse the effectiveness of information systems at the operational, tactical and strategic levels within an organisation.	● Business information systems, decision support systems, management information systems, strategic/executive information systems, office information systems, transaction processing systems, expert systems, global information systems, data warehouse systems, enterprise systems, enterprise resource planning systems, integrated information systems. ● Definition of information and data, sources of information, information requirements and

				the needs for information at different levels within an organisation. ● Storing information and its importance with regard to security, accuracy and relevance. ● Outputs e.g., payroll, invoicing, ordering, bookings, stock control, personnel records, goods tracking, decision-making, marketing, customer service.
2.	Understand the use of an information system to produce management information.	2.1	Explain the importance of an organisation having data and information that is current, valid and accurate. 2.2 Describe how an information system can be used for management reporting. 2.3 Determine the impact of ethical, technical and regulatory constraints that an organisation can face when gathering data and information. 2.4 Evaluate how strategic information systems can contribute to the competitiveness of organisations.	● Data quality & integrity, common errors. ● Reports e.g. sales report, college enrolment statistics, marketing analysis (brick v click), trends in the market, competition and market share. ● Current relevant regulation on security (e.g. GDPR, Sarbanes Oxley, PCIDSS). Geographical differences may be relevant. ● Delivering a differentiated product or service; delivering a product or service at a lower cost, specific segmentation of the market e.g. targeted marketing to specific target audiences; innovative product or service design and implementation.
3.	Be able to develop and implement a management information system for an organisation.	3.1	Review existing information systems used in a business to identify improvements for competitive advantage. 3.2 Justify recommended improvements to an existing information system. 3.3 Implement improvements to the information system. 3.4 Critically review the developed information system.	● Undertaking a critical review of an existing business information system, evaluating the overall strengths and weaknesses. ● Documenting recommendations for improvements to an existing business system. ● Using appropriate design and development methodologies and tools to implement the identified improvements ● Undertaking a critical review of the performance of the system.

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO2	All ACs under LO1 and LO2	Coursework	1500 words
LO3	All ACs under LO3	Computer Lab documentation	NA

Indicative Reading list

Peppard J; Ward J (2016) *The Strategic Management of Information Systems - Building a Digital Strategy* (4th Ed) Wiley.

Chaffey D; Wood S (2004) *Business Information Management: Improving Performance using Information Systems.* Prentice Hall.

NETWORK INFORMATION SYSTEMS

Unit Reference Number	R/617/2272
Unit Title	Network Information Systems
Unit Level	5
Number of Credits	20
Total Qualification Time	200 hours
Core / Option	Mandatory
SSAs	06.1 ICT practitioners
Unit Grading Structure	Pass / Fail

Unit Aims

The aim of this unit is to develop learners knowledge and skills in planning, configuring, setting up and managing networks (such as a LAN, PAN, MAN, WAN) as well as build skills in network monitoring, and knowledge of Network Security, network protocols and standards.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Understand the principles of networking.	1.1 Compare common networking approaches. 1.2 Assess how protocols enable the effectiveness of networked systems. 1.3 Explain the impact of network topology, communication and bandwidth management. 1.4 Evaluate the importance of Network Systems Management. 1.5 Explain the interdependencies of hardware, software and networking.	• System types: Peer-based, client-server, cloud, cluster, centralised, virtualised. • Protocols: Purpose of protocols; routed protocols e.g. IPv4, IPv6, IPv6 addressing, Global unicast, Multicast, Link local, Unique local, EUI 64, Auto configuration, FTP, HTTP, SMTP, POP3, SSL; management of protocols for addressing. • Topology: Logical e.g. Ethernet, Token Ring; physical e.g. star, ring, bus, mesh, tree, ring. • Network management, such as; throttling, traffic management etc.

		• Networking devices: Servers; hub, routers; switches; multilayer switch, firewall, HIDS, repeaters; bridges; wireless devices; access point (wireless/wired), content filter, Load balancer, Modem, Packet shaper, VPN concentrator. • Server type: Web, file, database, combination, virtualisation, terminal services server. • Workstation: Hardware e.g. network card, cabling; permissions; system bus; local-system architecture e.g. memory, processor, I/O devices. • Client server, cluster, WAN, LAN, etc.
2. Understand network management protocols and standards.	2.1 Evaluate typical network protocols and standards. 2.2 Evaluate different network monitoring systems	• OSI and TCP/IP models. • Network tomography, route analysis tools such as Solarwinds, Netmon, LibreNMS, etc.
3. Be able to plan, design, setup and configure a network system.	3.1 Produce a comprehensive design of a network to a given scenario. 3.2 Install a network according to a predefined network specification. 3.3 Configure network services and applications in a given scenario.	• Designing and planning a Network. • Installing and testing a network based on a specification. • Configuring network services and devices as specified by business requirements or from the design/plan.

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO2	All ACs under LO1, LO2	Coursework	2000 words
LO3	All ACs under LO3	Practical	NA

Indicative Reading list

Newman M (2010) *Networks: An Introduction*. OUP. Oxford.

Stewart JM; Chapple M (2015) *Cissp: Certified Information Systems Security Professional Study Guide* 7th Ed. Sybex.

Blokdyk G (2018) *Network information system Standard Requirements*. 5Starcooks.

IT PROJECT MANAGEMENT

Unit Reference Number	L/617/2271
Unit Title	IT Project Management
Unit Level	5
Number of Credits	20
Total Qualification Time	200 hours
Core / Option	Mandatory
SSAs	06.1 ICT practitioners
Unit Grading Structure	Pass / Fail

Unit Aims

The aim of this unit is to develop learners' skills in managing Information Technology projects to implement systems or change in their organisations. This unit is particularly relevant for middle and senior managers whose responsibilities include the introduction of operational or strategic change in their organisations.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:	Indicative Content
1. Be able to analyse business objectives to determine potential projects	1.1 Identify potential IT projects required from an appraisal of established business objectives 1.2 Perform a project feasibility study. 1.3 Determine project's aims and objectives with key stakeholders. 1.4 Review project methodologies suitable for the chosen project. 1.5 Justify the project methodology chosen for the given project.	● Review of business objectives. ● Selection of an IT project based on a business objectives. ● Carrying out, and documenting a project feasibility study based on a business objective. ● Considering risk. ● Consulting with stakeholders to determine project aims and objectives. ● Selecting a suitable project methodology such as Traditional approach, critical change approach, event change approach or proprietary/ formalised approaches, for

			example PRINCE, AGILE. ● Documenting why project methodology has been selected.
2. Be able to devise a project plan using relevant project management tools and models.	2.1	Produce an IT project management plan that covers aspects of cost, scope, time, quality, communication, risk and resources. 2.2 Produce a work breakdown structure. 2.3 Create milestone schedules for monitoring and completing the aims and objectives of the IT project.	● Developing the project plan, including planning for timescales and time management, cost, quality, change, risk and issues. ● Work breakdown structure. ● Use of Bar and Gantt Charts for effective planning.
3. Be able to manage an IT project.	3.1	Monitor project progress according to an IT project plan. 3.2 Manage risks and issues in an IT project according to agreed procedures. 3.3 Manage changes in an IT project according to agreed procedures. 3.4 Report on the progress of an IT project to appropriate stakeholders using agreed communication methods.	● Monitoring project progress: measuring progress, schedule plans, dealing with problems, PRINCE2. ● Initiating and maintain a risk register. ● Managing changes, maintaining a change log. ● Producing regular reports on project progress.
4. Be able to evaluate the project outcomes.	4.1	Critically evaluate and reflect on the project outcomes. 4.2 Reflect on the value of undertaking the IT project to meet stated objectives. 4.3 Produce a post-implementation report on lessons learnt.	● Objectively critiquing the project outcomes. ● The difference between reflecting on performance and evaluating a project, ie considering the research process, information gathering and data collection, then considering the quality of the research argument and use of evidence. ● Producing a post implementation report including lessons-learned, potential improvements etc.

Assessment

To achieve a 'pass' for this unit, learners must provide evidence to demonstrate that they have fulfilled all the learning outcomes and meet the standards specified by all assessment criteria.

Learning Outcomes to be met	Assessment criteria to be covered	Type of assessment	Word count (approx. length)
LO1, LO2, LO3, LO4	All ACs under LO1, LO2, LO3, LO4	Project	4500 words

Indicative Reading list

Gerber, J., & Williams, H. (2009). *IT project management: the role of governance.* Newtown Square, PA: Project Management Institute.

Brewer, J. L., & Dittman, K. C. (2013). *Methods of IT project management.* West Lafayette, IN: Purdue Univ. Press.

Portny, S. E. (2017). *Project management.* Hoboken, NJ: John Wiley & Sons, Inc.

IMPORTANT NOTE

Whilst we make every effort to keep the information contained in programme specification up to date, some changes to procedures, regulations, fees matter, timetables, etc may occur during the course of your studies. You should, therefore, recognise that this document serves only as a useful guide to your learning experience.

For updated information please visit our website www.othm.org.uk.