OTHM LEVEL 4 DIPLOMA IN INFORMATION TECHNOLOGY

Qualification Number: 603/3613/4

(RQF) Specification | September 2018| Version 1.0

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QUALIFICATION OBJECTIVES

The objective of the OTHM Level 4 Diploma in Information Technology is to provide learners with an excellent foundation for a career in a range of organisations. It is 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 4 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 arrangement 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 4 Diploma in Information Technology
Ofqual Reference Number	603/3613/4
Regulation Start Date	08/09/2018
Operational Start Date	10/09/2018
Duration	1 Year
Total Credit Value	120
Total Qualification Time (TQT)	1200 Hours
Guided Learning Hours (GLH)	480 Hours
Sector Subject Area (SSA)	06.1 ICT practitioners
Overall Grading Type	Pass / Fail
Assessment Methods	Coursework
Language of Assessment	English

EQUIVALENCES

OTHM qualifications at RQF Level 4 represent practical knowledge, skills, capabilities and competences that are assessed in academic terms as being equivalent to Higher National Certificates (HNC) and Year 1 of a three-year UK Bachelor's degree programme.

QUALIFICATION STRUCTURE

The OTHM Level 4 Diploma in Information Technology consists of 6 mandatory units for a combined total of 120 credits, 1200 hours Total Qualification Time (TQT) and 480 Guided Learning Hours (GLH) for the completed qualification.

Unit Ref. No.	Unit title	Credit	GLH	TQT
A/617/2265	Programming Foundations	20	80	200
F/617/2266	Systems Analysis and Design	20	80	200
J/617/2267	Web and Multimedia Applications	20	80	200
L/617/2268	Computer and Network Technology	20	80	200
R/617/2269	Software Development	20	80	200
J/617/2270	Managing Business Information	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

For entry onto the OTHM Level 4 Diploma in Information Technology qualification, learners must possess:
   ● Relevant NQF/QCF/RQF Level 3 Diploma or equivalent
   ● Learner must be 18 years or older at the beginning of the course
   ● **English requirements:** If a learner is not from a majority English-speaking country must provide evidence of English language competency. For more information visit English Language Expectations page.

PROGRESSIONS

Successful completion of Level 4 Diploma in Information Technology provides learners the opportunity for a wide range of academic progressions including OTHM Level 5 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 the second year of a three-year UK Bachelor's degree. For more information visit University Progressions page.

DELIVER 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 the 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.

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.

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 Qualifications has adopted a policy of providing equal opportunities for its learners, staff, applicants and others involved in its work. One aspect of this policy is its intention to prevent, as far as possible, the harassment of one person by another, whether on the basis of gender, sexual orientation, sexuality, race or ethnic origin, religion, disability, or any other personal attributes or views held. The qualification is expressly designed to support equality of opportunity and widening access to HE to all who can benefit from it, and it will operate on an inclusive and supportive basis to and for all learners.

UNIT SPECIFICATIONS

PROGRAMMING FOUNDATIONS

Unit Reference Number	A/617/2265
Unit Title	Programming Foundations
Unit Level	4
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 a basic understanding of Object-oriented programming languages and how to produce effective code. It also enables technical staff who are not programmers to gain a perspective of software development. The course is language neutral and teaches general concepts.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:
1. Understand the basic principles of algorithms.	1.1 Explain the concept of an algorithm. 1.2 Describe common algorithmic techniques and solutions. 1.3 Create a flowchart from an algorithm.
2. Understand the basic principles of computer programming.	2.1 Describe computer programming principles. 2.2 Summarise the historical development of computer programming. 2.3 Explain major components of a programming language. 2.4 Compare the strengths and limitations of modern computer programming languages.
3. Understand the basics of an 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.
4. Be able to code and compile software using a choice of object-oriented Programming language.	4.1 Design object oriented programs involving multiple objects. 4.2 Explain the impact of style on developing and maintaining programs. 4.3 Develop programs using best practice. 4.4 Implement, test and debug solutions.

Indicative contents

Topic	Course coverage
Learning Outcome 1	● History of Algorithms. ● Definition of algorithms ○ Input

	- o Output - o Definiteness - o Finiteness - o Effectiveness. - Brute Force. - Greedy Algorithms: "take what you can get now" strategy. - Divide-and-Conquer. - Decrease-and-Conquer. - Dynamic Programming. - Transform-and-Conquer. - Backtracking and branch-and-bound: generate and test methods. - Flowchart symbols.
Learning Outcome 2	- Definition, principles of programming - Abstraction - KISS - Open/Closed entities - Coupling - 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.
Learning Outcome 3	- Code Reuse and Recycling - Encapsulation - Design Benefits - Software Maintenance - Classes and objects - Arrays - Lists - Stacks - Queues - Trees - Intermediate representations and their purpose. - Arrays (1- and 2-dimensions) - Implementation of queues - Stacks and lists - Debugger

	● Breakpoints ● commands ● Use of IDEs ● data structure display/verification ● Use of debugging tools.
Learning Outcome 4	● Design using SQL, Java, JavaScript, C#, C++, Python, PHP, Ruby on Rails. ● Use Debugger, breakpoints, commands in the chosen language, C ++/JAVA/Python/or similar an OOPL. ● Code writing standards, comments, documentation ● Use of IDEs, test 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	Summary of quantity/quality
LO1, LO2, LO3	All ACs under LO1, LO2	Coursework	2000 words
LO4	All ACs under LO4	Project	NA

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.

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	200 hours
Mandatory / Optional	Mandatory
SSAs	06.1 ICT practitioners
Unit Grading Structure	Pass / Fail

Unit Aims

The aim of this unit is to develop learners' awareness of 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 and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:
1. Understand the principles of systems analysis and design.	1.1 Explain how systems analysis and design fits in to the software development life-cycle. 1.2 Explain the components of systems analysis. 1.3 Evaluate different approaches to system analysis and design. 1.4 Evaluate system design requirements.
2. Understand system design methodologies and modelling.	2.1 Explain system design concepts. 2.2 Evaluate different system design methodologies including object-oriented
3. Understand the human computer interface.	3.1 Explain the principles of HCI. 3.2 Evaluate HCI methodologies.
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.

Indicative contents

Topic	Course coverage
Learning Outcome 1	● Basic definitions and motivations of HCI, including history, theories, interaction paradigms, design principles and models. ● User centred design methods comprising user studies ● 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 models: understanding and use of predictive

	(Waterfall, Prototyping, RAD) and adaptive (Spiral, Agile, DSDM) software development models.
	● Lifecycle stage and connectivity: feasibility study, analysis, design, implementation, testing, review or analysis, design, implementation, maintenance, planning; requirements traceability.
	● 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 Object-oriented modelling.
Learning Outcome 2	● Information systems 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.
Learning Outcome 3	● Information and data: 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.
	● 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.
	● 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.
Learning Outcome 4	● Lab based, or work place

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/Lab	NA

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 MULTIMEDIA APPLICATIONS

Unit Reference Number	J/617/2267
Unit Title	Web and Multimedia Applications
Unit Level	4
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 an understanding of current design technology and the practices and tools used. The learner will develop the ability to create websites and gain confidence for the next step in a more advanced web development or design course or specialisation.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:
1. Understand web design technology.	1.1 Explain modern web development technologies and frameworks. 1.2 Evaluate the impact of common web development technologies and frameworks on website design, functionality and management. 1.3 Review the impact of website design on search engine results. 1.4 Explain evidence-based support for improving a site's index value and rank through SEO.
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 and techniques including HTML, CSS, and JavaScript available to design and develop a custom built website. 2.3 Compare cloud website development tools for businesses. 2.4 Evaluate the use of content management systems for website design and maintenance.
3. Understand multimedia content creation tools and software.	3.1 Evaluate tools available to create multimedia content for websites. 3.2 Explain regulatory and ethical considerations in creating multimedia content for websites.
4. Be able to create a multi-page website using multimedia content.	4.1 Create a design document for a branded, multipage website following client and user requirements. 4.2 Create a branded, multipage website supported with realistic multimedia content to follow given design specifications. 4.3 Critically evaluate the design and development process against design specifications.

Indicative contents

Topic	Course coverage
Learning Outcome 1	● 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. ● 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. ● 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. ● SEO techniques.
Learning Outcome 2	● 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) ● 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. ● Joomla, WordPress, Drupal, etc.
Learning Outcome 3	● InDesign, Adobe Illustrator, Photoshop, Dreamweaver & CorelDRAW. ● 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) ● Lab hours demonstrating InDesign, Adobe Illustrator, Photoshop, Dreamweaver & CorelDRAW use.
Learning Outcome 4	● Lab/workplace creation of website.

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	2000 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

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	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 of computer networking essentials, how they operate, protocols, standards, security considerations and the prototypes associated with a range of networking technologies.

Learners will explore a range of hardware and related software and will learn to configure and install these. A range of networking technologies will be explored including Local Area Networking (LAN), Wide Area Networking (WAN) and how these technologies evolved to form largescale networks. Protocol methodologies related to IP data networks will also be explored.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:
1. Understand the fundamentals of the computer.	1.1 Summarise the historical development of computer systems. 1.2 Explain the components of a modern computer. 1.3 Differentiate client and server environments. 1.4 Assess different operating systems.
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 Differentiate between network hardware and software.
3. Be able to carry out desktop engineering fundamentals.	3.1 Carry out PC assembling and basic troubleshooting. 3.2 Carry out installation of client and server operating systems. 3.3 Configure client systems to meet organisational policies.
4. Be able to demonstrate routing and switching techniques.	4.1 Configure a network using routing and switching techniques.

Indicative contents

Topic	Course coverage
Learning Outcome 1	● Introduction to PC ● Introduction to Operating System ● Booting ● Serial, Parallel, PS/2, SCSI & USB

	● Hard Disk ● Optical Storage Devices ● SMPS ● UPS ● Input Devices ● Printer ● Display Interfaces & Monitor ● Multimedia ● Modem ● Backup Devices ● Viruses ● Laptop & Palmtop Computers ● Installation of Operating System ● Managing Application on Operating System ● Mail Client Configuration ● PC Assembling Practical ● Trouble Shooting
Learning Outcome 2	● 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.
Learning Outcome 3	● Basic Numbering Systems ● Networking Fundamentals ● Transmission Media and Networking Topologies ● Network Reference Models ● Networking Protocols ● IP Addressing ● Subnetting ● Variable Length Subnet Mask (VLSM) ● Basic Router Configuration ● Router Boot Sequence ● IP Routing ● Back Up and Restoring of Router Configuration ● Switching Concepts ● Managing Switches ● Advanced Switching Technology ● Virtual Local Area Network (VLAN) ● Inter-VLAN Routing and VLAN Trunking Protocol ● Network Security ● Access list, Extended Access List, Named Access List ● Network Address Translation (NAT) ● Wireless technologies ● Wireless Security ● IPv6 ● IPv6 Routing Protocols ● WAN Technologies
Learning Outcome 4	● Transmission Media and Networking Topologies. ● Networking Protocols. ● IP Addressing. ● Subnetting. ● Variable Length Subnet Mask (VLSM). ● Basic Router Configuration.

	● Router Boot Sequence.
	● IP Routing.
	● Back Up and Restoring of Router Configuration.
	● Managing Switches.
	● 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.

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	All ACs under LO1, LO2	Coursework	1500 words
LO3, LO4	All ACs under LO3, LO4	Project / Computer Lab Simulation	NA

Indicative Reading list

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

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

SOFTWARE DEVELOPMENT

Unit Reference Number	R/617/2269
Unit Title	Software Development
Unit Level	4
Number of Credits	20
Total Qualification Time	200 hours
Mandatory / Optional	Mandatory
SSAs	06.1 ICT practitioners
Unit Grading Structure	Pass

Unit Aims

The aim of this unit is to introduce learners to the fundamental concepts of programming with the emphasis being laid on the whole of the software development process, to include the environment in which software is developed and the tools that assist in this process. Learners are given the choice to use a programming language of their choice.

Learning Outcomes and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:
1. Understand the software development lifecycle.	1.1 Explain the importance of each stage in traditional software lifecycle approaches. 1.2 Evaluate alternative software development approaches.
2. Understand the process of software development.	2.1 Evaluate software development techniques. 2.2 Evaluate the use of different software development tools. 2.3 Evaluate software testing methodologies. 2.4 Describe software deployment techniques. 2.5 Evaluate methods of reviewing system performance.
3. Be able to deploy a functional business application to meet business requirements.	3.1 Produce a software development plan from a system design. 3.2 Develop software to meet business requirements. 3.3 Test and deploy software. 3.4 Evaluate the software against business requirements.

Indicative contents

Topic	Course coverage
Learning Outcome 1	● Algorithm definition: Writing algorithms to carry out an operation, e.g. Bubble sort. ● The relationship between algorithms and code. ● The generation process of code; the roles of the pre-processor, compiler and linker, interpreter. ● Characteristics of code: Definitions of: data types (the role of constants/variables), methods (including input/output), control

	structures, iteration, scope, parameter passing, classes, inheritance and events. ● Key components of an Integrated Development Environment (IDE). ● Principles of the traditional Systems Development Life Cycle (SDLC) models, including Waterfall, Prototyping, and Spiral.
Learning Outcome 2	● Analyse a business-related problem and assess possible solutions: Discuss and produce a problem definition statement to highlight and describe the issues that need to be addressed. ● Research and consider possible solutions and predict the overall success of the application. ● Produce a Software Design Document: Review and discuss the value of Software Design Documents with regards to application development. ● Evaluate your possible solutions and synthesise the ideas into a single document that identifies and attempts to solve the business-related problem. ● Research and use information relating to software testing to create a suitable test plan for your business application.
Learning Outcome 3	● Work as a small team to plan and prepare your business application: Peer-review and debate your development plan by effectively communicating and defending the ideas in your Software Design Document. ● Discuss differences with regards to the possible strengths and weakness of each Software Design Document. ● Modify your Software Design Document to reflect any new insights or considerations. ● Prepare and produce a functional business application: Use your Software Design Document with your preferred design and development methodology and your selected tools and techniques to develop a functional business application. Create and quality check appropriate support documents for your application. ● Undertake a critical review of the performance and development of your application against all identified factors and any adopted design and development methodologies. ● Evaluate the overall strengths and weaknesses of your business application against its Software Design Document and initial requirements. Discuss and plan in detail possible revisions (including implementation) with regard to improving your application's performance.

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 quality/quantity
LO1, LO2 , LO3	All ACs under LO1, LO2, LO3	Coursework + Computer Lab documentation	2500 words

Indicative Reading list

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.

MANAGING BUSINESS INFORMATION

Unit Reference Number	J/617/2270
Unit Title	Managing Business Information
Unit Level	4
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 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 and Assessment Criteria

Learning Outcomes- The learner will:	Assessment Criteria- The learner can:
1. Understand how to assess information and knowledge needs of an organisation.	1.1 Summarise the typical business decisions made by organisations. 1.2 Evaluate the information and knowledge needed to ensure effective decision making. 1.3 Assess internal and external sources of information required.
2. Understand communication processes in an organisation.	2.1 Report on existing processes of communication in an organisation. 2.2 Determine benefits and limitations of existing communication processes. 2.3 Justify areas of improvement for communication processes.
3. Be able to improve systems relating to information and knowledge.	3.1 Report on existing approaches to the collection, formatting, storage and dissemination of information and knowledge in an organisation. 3.2 Recommend a strategy to improve the collection, formatting, storage and dissemination of information and knowledge. 3.3 Implement an improvement to access of information and knowledge in an organisation.

Indicative contents

Topic	Course coverage
Learning Outcome 1	● 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.
Learning Outcome 2	● Types: meetings and conferences, workshops and training events, internet and email, written, telephone, video conferencing, one-to-one meetings. ● Approaches: structured and coordinated, planned, formal and informal. ● Strategy: advantages, disadvantages; informal, face-to-face, formal in writing, emotional, intelligence.
Learning Outcome 3	● 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. ● An awareness of current UK national and international legislation including Data Protection Act 1998, Computer Misuse Act 1990, equal opportunities, Health and safety. ● Current EU approaches to tendering; copyright and licensing issues.

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

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.

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.

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