GCE AS/A LEVEL

WJEC GCE AS/A LEVEL Applied in

INFORMATION AND COMMUNICATION TECHNOLOGY

DESIGNATED BY QUALIFICATIONS WALES

SPECIFICATION

Teaching from 2017

For award from 2018 (AS)
For award from 2019 (A level)

Version 3 March 2019

This Qualification Wales regulated qualification is not available to centres in England.

SUMMARY OF AMENDMENTS

Version	Description	Page number
2	Removal of *Performance Descriptions* to align with reformed GCE qualifications.	93 and 94 in previous version
3	'Awarding, reporting and re-sitting' section has been amended to clarify resit rules and the carry forward of NEA (internal assessment) marks. Clarification of software development requirements within AICT 2.5, replacing 'prototypes' with 'a design for the system'.	90 26 and 34

WJEC GCE AS and A LEVEL in APPLIED ICT

For teaching from 2017
For AS award from 2018
For A level award from 2019

WJEC GCE AS AND A LEVEL APPLIED ICT (WALES)

Subject/Option Entry Codes	English-medium	Welsh-medium
Advanced Subsidiary (AS) "Cash in" entry *A Level (A)"Cash in" entry*	2535QS 1535QS	2535CS 1535CS
AICT 1: eBusiness – Gaining Skills in eBusiness	2535U1	2535N1
AICT 2: eSkills – Managing eBusiness data	2535U2	2535N2
AICT 3: eProject – Project planning for ICT	1535U3	1535N3
AICT 4: eStudio – ICT Marketing communications	1535U4	1535N4
AICT 5: eCode – Producing Software Solutions	1535U5	1535N5
AICT 6: eTransact – Selling and ICT	1535U6	1535N6

Unit	June 2018	June 2019 & each subsequent year
Unit 1	✓	✓
Unit 2	✓	✓
Unit 3		✓
Unit 4		✓
Unit 5		✓
Unit 6		✓

Qualification Designation Numbers

Advanced Subsidiary: C00/1189/3
Advanced: C00/1177/8

SUMMARY OF ASSESSMENT

Unit and Name	Status	Assessment
1. eBusiness	Mandatory AS/A Level (40%/16%)	**External:** 3 hour on-screen examination
2. eSkills	Mandatory AS/A Level (60%/24%)	**Internal:** Awarding body devised assessment
3. eProject	Mandatory A Level (24%)	**External:** controlled assessment
4. eStudio	Optional (Select either unit 4, 5 or 6) A Level (36%)	**Internal:** Awarding body devised assessment
5. eCode	Optional (Select either unit 4, 5 or 6) A Level (36%)	**Internal:** Awarding body devised assessment
6. eTransact	Optional (Select either unit 4, 5 or 6) A Level (36%)	**Internal:** Awarding body devised assessment

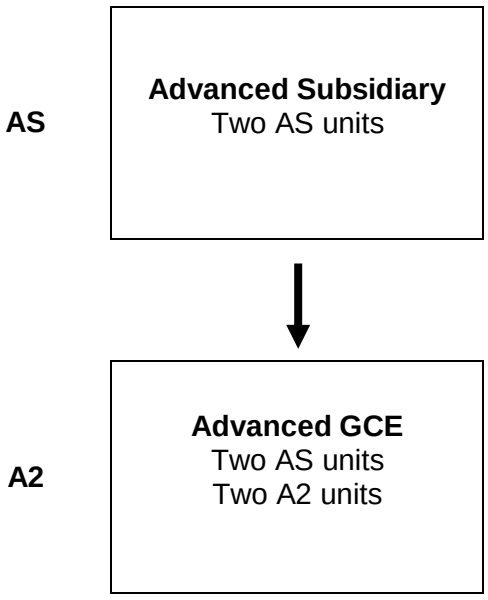
GCE AS AND A LEVEL APPLIED ICT

1 INTRODUCTION

The WJEC GCE in Applied ICT has been written so as to offer students a highly contemporary experience in ICT. It seeks to provide innovation in its delivery and promotes student creativity through the paperless scheme of assessment. Real world problems require real world solutions, solutions that acknowledge the multi-faceted nature of ICT in society today.

Qualifications available

The diagram below shows the relationship between the Awards in this GCE Applied ICT qualification.



Guided learning hours

The guided learning hours for the two-unit Advanced Subsidiary GCE is 180.

The guided learning hours for the four-unit A level GCE is 360.

Criteria for Advanced Subsidiary & Advanced GCE

This specification has been designed to meet the general criteria for GCE Advanced Subsidiary (AS) and Advanced (A) and the relevant subject criteria.

The AS qualification will be graded on a five-grade scale: A, B, C, D and E.

The A level qualification will be graded on a six-grade scale: A*, A, B, C, D, E

At A level, Grade A* will be awarded to candidates who have achieved a Grade A in the overall A level qualification and have also achieved a minimum UMS score in the A2 units.

Candidates who fail to reach the minimum standard for Grade E are recorded as U (Unclassified) and do not receive a certificate.

Assessment units may be retaken prior to certification for the AS or A level qualifications, in which case the better result will be used for the qualification award. Individual assessment unit results, prior to certification for a qualification, have a shelf-life limited only by the shelf-life of the specification.

Prior learning

There is no specific requirement for prior learning: although some learners will have already gained a knowledge and understanding of relevant areas through their study of ICT at GCSE, it is expected that for some this will be a new subject area. It is desirable for learners to have achieved Grades A*-C in GCSE, or the equivalent, in English and Mathematics before beginning this specification, although no formal qualification is required. Some learners are likely to have one or more of the following.

- A profile of GCSEs at grade C or above
- A level 2 qualification such as
  - Appropriate NQF level 2 qualification
  - an appropriate level 2 NVQ qualification

This specification may be followed by any candidate, irrespective of age, sex, ethnic, religious or cultural background.

Progression

This qualification supports progression into appropriate further/higher education, employment or training.

This specification has been designed to provide a suitable foundation for the study of ICT, or a related area of study, at further or higher education and/or preparation for future employment. Examples of appropriate further/higher education include

- Honours and Foundation degrees in ICT or a related subject
- Higher Nationals in ICT or a related subject
- Level 4 and Level 3 NVQs in ICT or a related subject.

Rationale

All assessment units require the candidate to exhibit essential skills developed through the study of Applied ICT, i.e. the ability to identify, understand, analyse and evaluate key critical concepts and issues from ICT theory and practice. The structure of the specification draws together different key elements of the subject.

This specification:

- Serves as a discrete AS course, or as the first part of a full Advanced Level course (AS)

- Builds upon the knowledge, understanding and skills specified in the GCSE criteria for ICT

- Is of interest to a wide range of students - for example, any cohort may include mature students returning to study and candidates from diverse ethnic backgrounds

- Promotes progression through the AS and A Level and provides a suitable foundation for the study of ICT, or a related area of study, at Further or Higher Education and/or preparation for future employment and the world of work

- Encourages candidates to develop the ability of critical thinking, both with respect to ICT theory and practice, and in terms of local, national and international issues and topics, including the nature of a changing technological, business and organisational environments

- Provides opportunities for candidates to consider ethical problems in the context of research into ICT

- Promotes interest in contemporary local, national and international ICT related issues)

- Provides opportunities for candidates to develop the skills assessed through the Skills Challenge Certificate within the Welsh Baccalaureate:

- Is available through the medium of English and Welsh

Prohibited combinations and overlap

Every specification is assigned a national classification code indicating the subject area to which it belongs. Centres should be aware that candidates who enter for more than one GCE qualification with the same classification code will only have one grade (the highest) counted for the purpose of the School and College Performance Tables. The classification code for this specification is 0010.

Equality and fair assessment

This specification has been designed to offer fair access for all candidates and to minimise any later need to make reasonable adjustments for candidates who have particular requirements, while preserving the rigour of the qualification. A review of the specification and the regulatory criteria on which it is based has revealed the following potential barriers to access arising from the assessment of skills and understanding that are considered essential to the subject, as defined by the subject criteria:

Essential use of computer keyboard, monitor and audio function.

Details of the special arrangements and special consideration for candidates with particular requirements are contained in the Joint Council for Qualifications document *Candidates with Special Assessment Needs: Regulations and Guidance*. Copies of this document are available from the WJEC.

The wider curriculum

Spiritual, moral, ethical, social and cultural dimension

ICT is a subject that by its nature requires candidates to consider spiritual, moral, ethical, social and cultural issues. ICT is woven into the fabric of contemporary society and impacts upon all aspects of our lives.

In Unit 1 - eBusiness , candidates are required to consider the use of ICT within organisations. This could include aspects of corporate security and the legal framework within which organisations operate. The increasing use of ICT has seen the emergence of some undesirable activities, not least cyber crime. Unit 1 also considers contemporary approaches to cyber security.

Health and safety issues including ergonomics, the need for breaks and the potential for injury are considered also in unit 1.

A broader view of contemporary issues is provided in other units, for example Unit 6 – eTransact considers privacy, fraud and identity theft.

This specification seeks to encourage students to exploit the potential benefits of ICT in a wide range of settings and thereby improve their digital competency.

Facilities required

Information is available outlining hardware, software and network requirements (contact e-assessment@wjec.co.uk) This information relates to the electronic assessment of the qualification and will provide centres with information on the completion of on-screen examinations.

In order to provide suitable preparation for the scheme of assessment (including coursework and controlled assessment) and to enable appropriate delivery, centres should have sufficient ICT support to allow candidates access to a computer throughout the duration of their studies.

Centres should provide access to a range of generic software packages as outlined in the introduction of each unit. Internet access is essential.

Private candidates are advised to contact the WJEC *before* starting the course.

2 AIMS

This specification meets the stated aims of the GCE qualification in Applied ICT by

- developing a broad range of ICT skills and knowledge of the uses of ICT in vocational contexts
- providing opportunities for learners to develop sufficient depth of understanding to inform their choices between further study or training
- developing knowledge and understanding of the components, functions and applications of information systems within a range of organisations
- developing an understanding of the main principles of solving problems using ICT and develop the skills necessary to apply this understanding
- encouraging learners to acquire the following range of skills through the study of realistic contexts:
  - practical skills: personal organisation and time management skills
  - presentational skills: reports and oral presentation
  - personal skills: initiative and creativity
  - interpersonal skills: team working, discussing issues or problems, leading a team
  - cognitive skills: investigation and research, decision making and project planning
  - skills assessed through the Skills Challenge Certificate within the Welsh Baccalaureate:
- encouraging learners to develop knowledge and understanding of:
  - the broader environment in which ICT is used including the impacts of
  - legislation, ethics, society and the international / global dimension
  - Emerging technologies
- encouraging learners to develop the skills required to:
  - progress from AS to A2
  - enter further education and/or training within the ICT sector
  - enter into employment within the ICT sector
  - evaluate and improve own learning

3 ASSESSMENT OBJECTIVES

Candidates must meet the following assessment objectives in the context of the content detailed in Section 4 of the specification.

AO1	**ICT capability** – Candidates demonstrate practical capability in applying ICT
AO2	**Knowledge and understanding** – Candidates demonstrate knowledge and understanding of ICT systems and their roles in organisations and society
AO3	**ICT problem solving** – Candidates apply knowledge, skills and understanding to produce solutions to ICT problems
AO4	**Evaluation** – Candidates evaluate ICT solutions and their own performance

Assessment objectives: AS

Unit	A01	A02	A03	A04	Total
1	12	20	4	4	40
2	18	10	26	6	60
Total	**30**	**30**	**30**	**10**	**100**

Assessment objectives: A level

Unit	A01	A02	A03	A04	Total
1	4.8	8.0	1.6	1.6	16
2	7.2	4.0	10.4	2.4	24
3	7.2	3.6	6.0	7.2	24
4/5/6	10.8	5.4	9.0	10.8	36
Total	**30**	**21**	**27**	**22**	**100**

4 SPECIFICATION CONTENT

AICT 1 - eBusiness

Gaining skills in eBusiness

Introduction

We all know that ICT is constantly changing - hardware and software is forever developing and evolving.

Businesses also have to change in order to remain competitive and many adopt developments in ICT to gain a competitive advantage.

The ways in which we need to work and interact with others have changed: email; mobile communications; videoconferencing; home working and hot-desking are but a few of these changes.

We need to be competent users of a variety of different devices and software applications: computers; laptops; smartphones all use a variety of software essential to the eBusiness. New jobs have developed as a result of eBusiness, such as web designers and database managers. Nearly all businesses demand ability in ICT these days, and for many jobs specific ICT skills are essential.

eBusiness needs eCompetent employees.

Software requirements

To facilitate the successful completion of this unit, candidates will need access to the following software

- The Internet
- Web authoring software
- Pdf writing software
- Standard Office software
- Graphics packages with vector and bitmap tools

Content

	Focus	Amplification
		Candidates should be able to:
AICT 1.1	**Background**	Describe different types of organisations and how they collect and use information to carry out their functions. Describe different working styles and the new opportunities provided by ICT. Demonstrate competent use of applications software.
AICT 1.2	**Information and organisations**	
	Types of organisations	Distinguish between a range of organisations including utilities, local government, charities, banks, retailers, manufacturers, travel, leisure and tourism industries.
	Stakeholders	Identify and describe the relationships between stakeholders including managers, employees, customers, suppliers and distributors.
	Data and information	Distinguish between data and information. Describe how data is used to produce information, such as personnel records, customer details, stock control, booking systems and financial records
AICT 1.3	**How organisations collect information**	
	Secondary sources	Describe the information organisations obtain from secondary sources. Explain the advantages and disadvantages of using government publications, business directories, published market research and statistics.

	Primary sources	Describe the information organisations obtain from primary sources. Explain the advantages and disadvantages of using observation, paper based and online forms, telephone and face to face interviews Explain the advantages and disadvantages of using OCR, OMR, chip and pin cards, magnetic strips, scanners.
	Select sources	Justify the selection of particular sources and data collection methods in given situations
AICT 1.4	**How organisations use information**	
	Management	Describe the role of specialised management information systems (MIS). Explain the advantages of the use of specialised management information systems (MIS) to support decision making. Describe the role of specialised project management software. Explain the advantages of the use of specialised project management software.
	Administration	Describe how software is used to support the running of an organisation. Use application software to produce standard business documents such as agenda, business cards, delivery notes, invoices, memos, minutes, purchase orders, questionnaires, reports and business letters.
	Marketing and sales	Describe the advantages of the use of data handling and modeling applications to identify trends, target sales and manage transactions. Analyse information to establish market trends. Explain why it is important to maintain accurate customer records. Use application software to handling marketing and sales data.

	Stock control	Describe the functions of a stock control system. Explain the advantages of operating a computerised stock control system.
	Purchasing	Describe the advantages of using database software to maintain supplier and product details. Use application software to handling supplier and product data. Explain the use, advantages and limitations of electronic data interchange (EDI) between organisations.
	Human resources	Describe the advantages of using database software to maintain accurate records of staff and their working patterns. Use application software to handling staff data.
	Finance	Explain the advantages of using spreadsheet software and specialised packages for carrying out and recording the following financial transactions including payroll, cash flow, accounts and balance sheets. Use spreadsheet software to produce standard financial documents.
AICT 1.5	**Information flows**	Analyse given situations and produce information flow diagrams to illustrate the flows of information within an organisation and between an organisation, its customers, suppliers and other external agencies.

AICT 1.6	**Big data**	Describe Big Data as a massive volume of structured and unstructured data that is so large and complex that traditional data handling applications are not able to process the data.
	Data warehouse	Describe a data warehouse as a large collection of data gathered by an organisation that is used to guide management decisions
	Data mining	Explain that data mining is a process used by organisations to turn raw data into useful information such as patterns and trends to develop more effective marketing strategies.
AICT 1.7	**Communication**	Distinguish between formal and informal methods of communication.
	Internal methods	Select and justify the use of appropriate methods for the communication of given information within an organisation including intranet, email, telephone, reports, memoranda and meetings.
	External methods	Select and justify the use of appropriate methods for the communication of given information between an organisation, its customers, suppliers and other external organisations including extranet, Internet, email, video conferencing, telephone, letters, reports, standard business documents, face to face.
	Email	Describe the main features of an email application such as the ability to send and receive messages, store and manage messages, maintain address books, send attachments, send messages to multiple recipients.
	VoIP	Describe the use of contemporary VoIP communication using personal computers, tablets and smart phones. Describe the uses of IP telephones and explain the advantages and any disadvantages of their use.

AICT 1.8 Networks

Types of network	Describe the main properties and characteristics of local area, (LAN) and wide area (WAN) networks. Describe the characteristics of VLAN, WLAN and VPN networks, their use and the equipment required to install them.
Benefits	Describe the benefits of computer networks in terms of efficient use of software and hardwareresources, data access and sharing,collaborative working, effective communication and central management/monitoring of users, security and data. Explain that in a distributed network the sharing of resources is arranged by the operating system without any action being required by the user.
Disadvantages	Explain the potential disadvantages associated with computer networks in terms of security, reliability, setup and maintenance costs.

AICT 1.9	**The Internet**	Describe the Internet as the facility to link computers worldwide and enable communication between people, transfer of data between computers and distribution of information.
	Service Provider (ISP)	Explain the role and function of an ISP and describe the services they provide such as Internet access,search engines, email addresses, newsgroups, web space and support. Explain the advantages and potential limitations of email communications.
	Intranet	Describe an intranet as a communication system providing similar services to the Internet solely within a particular organisation. Explain that an extranet is an intranet with public access permitted to certain areas.
	Worldwide Web (WWW)	Describe that the WWW is a collection of information stored at websites in the form of web pages. Explain the function of an Internet web browser. Explain the role and structure of a URL in terms of protocol, domain name and extension. Describe the contemporary use made of blogs, forums and web based collaborative work spaces.
	eSafety	Describe the need for users to take adequate and sensible precautions to ensure safety when using the Internet.
	Netiquette	Describe the main conventions that try to encourage behaviour when using the Internet that does not cause inconvenience or offence to others.

AICT 1.10	**Working styles and new opportunities**	
	Organisations	Describe new opportunities for organisations provided by ICT such as opening of worldwide markets, 24/7 operation, collaborative working, effective communications and mobility. Present a balanced view and describe possible disadvantages of new technology in terms of investment, data security, the need for change and increased competition. Describe new opportunities for managers and other employees provided by ICT such as potential for home working, flexible working hours, hot-desking and mobility.
	Employees	Describe new opportunities for organisations provided by ICT such as opening of worldwide markets, 24/7 operation, collaborative working, effective communications and mobility. Present a balanced view and describe possible disadvantages of new technology in terms of investment, data security, the need for change and increased competition. Describe new opportunities for managers and other employees provided by ICT such as potential for home working, flexible working hours, hot-desking and mobility. Identify the social benefits arising from these opportunities such as increased interaction with family, improved work motivation and increased leisure time. Present a balanced view and describe possible disadvantages of new technology such as changes in work skills, security of work and reduced social interaction.

AICT 1.11	**ICT skills**	Develop and use structures for integrating and presenting information.
	Word processing software	Produce standard business documents such as an agenda, business cards, delivery notes, invoices, memos, minutes, purchase orders, questionnaires, reports and business letters. Within these documents candidates should be able to: Set page layout and use headers and footers. Set and apply font styles and sizes. Align and justify text. Use bullets, numbering, tabulation and columns. Use lines and borders. Create and modify tables. Insert and edit images. Import text files. Create mail merge documents.
	Database software	Create tables and set field properties • applying sensible lengths to text fields • change 0 and 1 field to yes/no • format a date correctly • Create relationship between tables (it will always be a 'one to many') Create validation rules • Range check • Input Mask • Lookup Import text files • Check that a telephone number/contact number etc. is text • Populate the tables using an Append Query or create a Make Table Query and apply the field properties and validations rules Create data entry forms • Create a sub-form • Insert logo • Insert text • Command Buttons • Use FUNCTIONS within a form Sort and search data • Using simple criteria • Using complex criteria • Calculations Produce database reports • Report header/footer • Page header/footer • Insert page breaks • Insert logo • Use FUNCTIONS within a report • Format a report

Spreadsheet software

- Import text files – into existing or new worksheet, transfer data using cell reference
- Insert, delete and size rows and columns
- Set, copy, move and clear cell contents and formats
- Enter formulae as required
- Use appropriate functions to derive required results eg
    - SUM
    - MIN
    - MAX
    - AVERAGE
    - TODAY
    - IF (nested IF)
    - LOOKUP
    - HLOOKUP
    - VLOOKUP
    - COUNTA
    - COUNTIF
    - SUMIF
- Make use of other features of the software including
    - absolute cell referencing – (named range or $)
    - sorts
    - conditional formatting
- Create and format charts including titles labels, shading, patterns, line styles and borders

Web authoring software

Create a structured web pages
Set page properties
Include accessibility features

- adding ALT (alternative) text to images
- using scaleable fonts

- Enter text and images
    - Insert text from a file
    - Create a form to allow user to insert text
    - Insert image
    - Create rollover images
- Insert media components
    - video
    - sound
    - animation
- Insert hyperlinks and other navigational features
    - navigation bars
    - hotspots
    - hyperlinks (internal, external, email)
    - rollovers

AICT 1.12 Standard ways of working

Safe working	Describe safe working considerations relevant to computer use in terms of correct positioning of hardware, cables and seating. Describe suitable lighting arrangements for computer use. Explain the need for regular breaks and the associated implications on efficiency.
Ergonomics	Describe the ergonomic principles relevant to workstation design in terms of positioning and design of hardware, adequacy of desk space, quality of seating and control of glare.
Security	Describe the potential threats arising from the use of ICT to manage personal information and identify situations where malicious or accidental damage to data could occur. Explain simple processes that protect the security of data such as passwords, user identification, access rights, encryption and firewalls.
Back up	Describe different procedures for creating backups and explain how data might be restored if necessary.
File management	Explain the importance of naming conventions in the organisation of data such as meaningful filenames, folder names and accurate version control.
Legislation	Explain how current legislation prevents misuse of personal information, business information and software.

AICT1.13 Cybersecurity

Protecting data integrity	Explain the special security and integrity problems which can arise during online updating of files.
Cryptography	Describe the need for and the purpose of cryptography. Describe techniques of cryptography and their role in protecting data. Follow algorithms and programs used in cryptography
Biometrics	Describe the purpose and use of contemporary biometric technologies.

	Describe the benefits and drawbacks of biometric technologies. Describe the complexities of capturing, storing and processing biometric data.
Mechanisms of attack and defence	Describe types and mechanisms of malicious software. Describe black hat hacking, white hat hacking and penetration testing.

Assessment of this unit

The assessment of this unit is by external on-screen examination, set and marked by WJEC. The examination will consist of objective and subjective assessment items, based on stimulus information consisting mainly of case studies of actual and/or fictionalised businesses. The assessment is organised into part A and Part B. Part A is question based whereas part B is a combination of practical tasks and questions.

The assessment objective weightings for this unit are as follows:

AO1	ICT Capability	30%
AO2	Knowledge and understanding	50%
AO3	ICT Problem solving	10%
AO4	Evaluation	10%

AICT 2 – eSkills

Managing eBusiness data

Introduction

For eBusinesses to succeed they must make a profit – forecasting and data management is critical to success.

eBusinesses use ICT to plan, monitor and forecast their daily progress and require experts in the use of spreadsheets and databases to manage this process.

The ability to effectively interpret situations; forecast events and monitor data trends will offer the eBusiness the potential to succeed.

Software requirements

To facilitate the successful completion of this unit, candidates will need access to the following software

- The Internet
- Web authoring software
- PDF writing software
- Standard Office software
- Spreadsheet software
- Relational database management software with a reporting tool
- Graphics packages with vector and bitmap tools

Content

	Focus	Amplification
		Candidates should be able to:
AICT 2.1	**Background**	Describe the use of data handling applications within organisations and use database software to solve given problems. Describe the use of numerical modelling by organisations and use spreadsheet software to solve given problems.
AICT 2.2	**Analysis**	Analyse a given situation and produce a specification that describes the purpose of the project, the methods to be used in the solution and how the effectiveness of the solution will be judged. Describe the objectives of the project stating what the implemented solutions will achieve.
AICT 2.3	**Database design**	Produce a design for a database that is suitable for implementation by a competent third party.
	Tables	Analyse a given data set, identify related sets of data and design suitable data structures that will allow the related data to be managed efficiently. Specify suitable fieldnames, data types, field sizes and key fields. Specify suitable validation rules and input masks that will control data input and limit errors.
	Input	Design input forms that will facilitate accurate data entry through the use of features such as combo boxes, user instructions and radio buttons.
	Interface	Design forms that will provide an interface to aid user efficiency. Consider accessibility and usability
	Output	Design the output required in terms of content, layout and presentation.
	Processing	Describe the processing stages required in terms of data sorting, searches and calculations.

AICT 2.4	**Spreadsheet design**	Produce a design for a spreadsheet that is suitable for implementation by a competent third party.
	Worksheets	Analyse a given data set and design suitable worksheets that will allow the data to be presented and manipulated efficiently. Specify suitable titles, column and row headings and cell formats. Specify suitable validation rules that will control data input and limit errors. Specify the formulae and functions that will be required to achieve the required outcomes.
	Input	Design features that will facilitate accurate data entry such as list and combo boxes, input messages, user instructions and radio buttons.
	Interface	Design an interface to aid user efficiency. Consider accessibility and usability.
	Output	Design the output required in terms of content, layout and presentation.
	Efficiency	Specify macros that will automate common tasks.
AICT 2.5	**Software development**	Implement the database and spreadsheet designs to produce a system for testing and review. Revise the designs for the system in response to feedback obtained from testing. Implement the revised designs to create the final products.

AICT 2.6	**Testing**	Produce plans and data for summative testing of the database and spreadsheet solutions. Implement the plans and present and discuss test results.
AICT 2.7	**Documentation**	
	Tutorial	Produce screen-based tutorials to illustrate the use of both the database and spreadsheet solutions.
	Technical guide	Provide details of the technical components of the database and spreadsheet solutions.
AICT 2.8	**Evaluation**	Evaluate the performance of the database and spreadsheet solutions against the original objectives, identify any limitations and make suggestions for further improvements. Describe strengths and weaknesses in own performance in the design and development stages of the project. Identify problems encountered during the design and development stages of the project and suggest how these could be avoided in future.
AICT 2.9	**ePortfolio**	Create an ePortfolio that complies with the given technical specification to present the design and outcomes of the project. Present the test plans, test data, test results and the final project review as part of the ePortfolio. Demonstrate the ability to use text and graphics to introduce the required evidence in an appropriate manner. Demonstrate the ability to create suitable hyperlinks and navigational features to ensure that all evidence is readily accessible. Ensure that all evidence can be viewed using web-browsing software.

Assessment of this unit

This is a mandatory unit.

Candidates will be required to produce database and spreadsheet solutions to suit business-related situations described in the board set assessment. The scenario will provide background information to the problem and will describe current working practices and their associated problems.

The assessment objective weightings for this unit are as follows:

AO1	ICT Capability	30%
AO2	Knowledge and understanding	16.7%
AO3	ICT Problem solving	43.3%
AO4	Evaluation	10%

Assessment Grid

The following grid is to be used in conjunction with the WJEC devised assessment.

	Assessment Objective				
Section	**AO1**	**AO2**	**AO3**	**AO4**	**Total**
Specification			5		**5**
System design		7	18		**25**
Implementation	10	5	15		**30**
Testing		5	5		**10**
Documentation	10				**10**
Review				10	**10**
Eportfolio	10				**10**
Totals	**30**	**17**	**43**	**10**	**100**

SPECIFICATION - 5 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Described a given situation and identified he methods to be used in the solution • Put forward objectives that indicate the scope of the proposed solution	The candidate has • Analysed a given situation and has produced a specification that identifies the main purposes of the project and describes the methods to be used in the solution • Put forward objectives that include success criteria and describe the required performance of the proposed system	The candidate has • Analysed a given situation and produced a working specification that clearly summarise the purpose of the project and describes, with technical justification, the methods to be used in the solution • Put forward a range of objectives that include success criteria and clearly define the required performance of the proposed system
0 –2 marks	3 – 4 marks	5 marks

DATABASE DESIGN - 15 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Analysed a given data set and produced table designs with suitable fieldnames, data types, field sizes and key fields. The design may include some proposals for validation rules and/or input masks • Produced proposals for input formats to aid data entry • Included proposal for output • Identified and provided examples of some of the required processing to be carried out	The candidate has • Analysed a given data set, identified all related sets of data and designed suitable data structures to enable the data to be managed. The design will specify suitable fieldnames, data types, field sizes and key fields. It will also include proposals for validation rules and input masks that will control data input and limit errors • Produced designs for input formats that aid data entry • Included proposals for output and the intended layout of reports to be generated • Identified and provided examples of the required data sorting, searches and outlines of calculations to be carried out	The candidate has • Analysed a given situation and produced a analysed a given data set, identified all related sets of data and designed suitable data structures to enable the data to be managed effectively. The design will specify correct and suitable fieldnames, data types, field sizes and key fields. It will also include comprehensive proposals for validation rules and input masks that will control data input and limit errors • Produced designs for input formats that propose a range of features to aid data entry • Included proposals for output and clearly illustrated the intended layout of reports to be generated • Identified and provided detailed examples of the required data sorting, searches and calculation to be carried out
0 –7 marks	8 – 11 marks	12 - 15 marks

SPREADSHEET DESIGN - 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Analysed a given data set and produced worksheet designs with suitable titles, column and row headings and cell formats. It will also include some indication of the formulae and functions required to achieve some of the required outcomes • Produced proposals for input and output formats • Produced designs for an interface to aid user efficiency • Identified automated routines that will aid user efficiency	The candidate has • Analysed a given data set and designed suitable worksheets that will allow data to be presented and manipulated. The design will include suitable titles, column and row headings and cell formats and will include validation rules that will limit errors. It will also indicated the formulae and functions needed to achieve the required outcomes • Produced designs for input formats and outputs that consider layout and content • Produced designs for an interface to aid user efficiency. The design indicates that usability has been considered • Identified and described automated routines that will aid user efficiency	The candidate has • Analysed a given data set and designed suitable worksheets that will allow data to be presented and manipulated efficiently. . The design will include suitable titles, column and row headings and cell formats and will include validation rules that will control data input and limit errors. It will detail the formulae and functions needed to achieve the required outcomes • Produced designs for input formats that propose features to aid data entry and for outputs that illustrate the intended layout and content • Produced designs for an interface to aid user efficiency. The design indicates that accessibility and usability have been considered • Identified and fully described a range of automated routines that will aid user efficiency
0 – 5 marks	6 – 8 marks	9 - 10 marks

DATABASE IMPLEMENTATION- 15 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Produced a series of table structures. The tables include suitable fieldnames, data types, field sizes and key fields. There has been an attempt to use relationships to manage data • Produced data entry forms that include some customisation intended to aid data entry • Produced an interface that provides some improvement in user efficiency • Implemented correctly some of the required processing • Produced some of the required outputs	The candidate has • Produced a series of related tables that enable data to be managed. The tables include suitable fieldnames, data types, field sizes and key fields. The also include validation rules and input masks that control data and limit errors • Produced data entry forms that include some features that aid data entry • Produced an interface that improves user efficiency • Implemented correctly most of the required data sorts, searches and calculations • Produced the required outputs.	The candidate has • Produced a series of related tables that enable data to be managed efficiently. The tables include correct and suitable fieldnames, data types, field sizes and key fields. The also include comprehensive validation rules and input masks that control data and limit errors • Produced data entry forms that include a range of features that aid data entry • Produced an interface that significantly improves user efficiency • Implemented correctly the full range of required data sorts, searches and calculations • Produced the required outputs. The outputs will be correct in terms of content and presentation
0 –7 marks	8 – 11 marks	12 - 15 marks

SPREADSHEET IMPLEMENTATION- 15 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Produced a series of worksheets that allow data to be presented and manipulated. The worksheets include suitable titles, column and row headings and cell formats. Formulae and/or functions are used to achieve some of the required outcomes • Produced some input formats that aid data entry • Produced an interface that provides some improvement in user efficiency • Produced some of the required outputs • Produced some automated routines that may aid user efficiency	The candidate has • Produced a series of linked worksheets that enable data to be presented and manipulated. The worksheets include suitable titles, column and row headings and cell formats and utilise validation rules to control data input and limit errors. Correct formulae and functions are used to achieve most of the required outcomes • Produced input formats that aid accurate data entry • Produced an interface that improves user efficiency • Produced the required outputs. • Produced automated routines that aid user efficiency	The candidate has • Produced a series of well-presented linked worksheets that enable data to be manipulated efficiently. The worksheets include suitable titles, column and row headings and cell formats and utilise validation rules to control data input and limit errors. Correct formulae and functions are used to achieve all required outcomes • Produced input formats that aids data entry significantly • Produced an interface that significantly improves user efficiency • Produced the required outputs. The outputs will be correct in terms of content and presentation • Produced a range of automated routines that improve user efficiency significantly
0 –7 marks	8 – 11 marks	12 - 15 marks

TESTING - 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Produced a design for the system and obtained limited feedback • Produced a test plan for most areas of the system and presented some results with brief discussions	The candidate has • Produced a design for the system and made changes in response to feedback • Produced a test plan for testing most areas of the systems for correct operation and has presented results with suitable commentaries	The candidate has • Produced a design for the system, obtained feedback and refined the designs in response to feedback or offered clear reasons where suggestions have been discounted • Produced a comprehensive plan for testing all areas of the systems for correct operation and presented all results with suitable commentaries
0 – 5 marks	6 – 8 marks	9 - 10 marks

DOCUMENTATION - 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Produced some screen-based instructions for the use of both the database and spreadsheet solutions • Produced details that explain some of the technical components of the database and spreadsheet solutions	The candidate has • Produced screen-based instructions for the use of both the database and spreadsheet solutions • Produced details that explain clearly most of the technical components of both the database and spreadsheet solutions	The candidate has • Produced a comprehensive screen-based tutorial that clearly illustrates the use of both the database and spreadsheet solutions • Produced comprehensive and well presented details that clearly explain the technical components of both the database and spreadsheet solutions
0 – 5 marks	6 – 8 marks	9 - 10 marks

REVIEW - 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Made some evaluative comments about both the database and spreadsheet solutions • Commented on own performance in the design and production of the solutions • Commented on problems arising during the project.	The candidate has • Evaluated the completed solutions against the original objectives, identified some limitations and described possible improvements • Produced an account of their own performance in the design and production of the solutions • Commented on changes in approach that could be used to avoid specific problems in the future	The candidate has • Evaluated the completed solutions against the original objectives, identified limitations and described significant potential improvements • Produced a description of both strengths and weaknesses in their own performance in the design and production of the solutions • Discussed specific changes of approach that would be adopted in future to avoid problems experienced during the project.
0 – 5 marks	6 – 8 marks	9 - 10 marks

ePORTFOLIO - 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced an eportfolio that • Comprises a series of pages that are easily viewed on screen. • Allows access to most of the database and spreadsheet solutions and supporting evidence. • Takes some account of the intended auidience	The candidate has produced an eportfolio that • Provides a context for the database and spreadsheet solutions and supporting evidence, with most of the content prepared to facilitate viewing on screen. • Allows access to most of the database and spreadsheet solutions and supporting evidence. • Is accurate and suitable for the intended audience.	The candidate has produced an eportfolio that • Provides a context for the database and spreadsheet solutions and supporting evidence, with all of the content prepared to facilitate viewing on screen. • Is fully functional eportfolio and allows access to all sections of the database and spreadsheet solutions and supporting evidence. • Is accurate, consistently presented and clearly matched to the intended audience.
0 – 5 marks	6 – 8 marks	9 - 10 marks

AICT 3 – eProject

Project planning for ICT.

Introduction

A project of any size needs effective planning to maximise success.

Managing eProjects are no different. In fact effective project management is essential to the completion of any ICT based project. eProject managers need to be skilled in applying their knowledge and eSkills to solve problems and be able to manage available resources.

Teamworking skills are essential. Self-discipline to complete individual tasks is a prerequisite.

eBusinesses need good eProject managers.

Software requirements

To facilitate the successful completion of this unit, candidates will need access to the following:

- The Internet
- Web authoring software
- Pdf writing software
- Standard Office software including a spreadsheet package
- Graphics packages with vector and bitmap tools
- Project management software

Content

	Focus	Amplification
		Candidates should be able to:
AICT 3.1	**Background**	Describe project management in terms of the organisation, planning and control of the stages of the project development cycle. Maintain an individual diary to produce a comprehensive record. Work with others to analyse a given scenario. Produce an individual project proposal and project plan. Work individually to organise, plan and control the management of a given problem using project management tools. Work individually to produce a model to solve a given problem.
AICT 3.2	**Stakeholders**	
	Client	Describe the roles and responsibilities of the client organisation, senior manager and end user in the project development cycle.
	Project team	Describe the roles and responsibilities of the project manager, developer, reviewer and supplier in the project development cycle.
AICT 3.3	**Analysis**	**Work with others to**
	Client requirements	Establish an understanding of the client's requirements for the project through the analysis of a given brief.
	Stakeholders	Identify the stakeholders who will be affected by the project through the analysis of a given brief.
	Timescale	Establish a plan and identify deadlines to achieve the client's requirements.
	Costs	Prepare costings for the proposed project using given financial information.

	Roles and responsibilities	When applicable, allocate roles to suit individual strengths and take responsibility for a delegated role.
	Formal meetings	Follow standard procedures for the organisation of formal meetings including preparation of agenda and minutes. Contribute appropriately during formal meetings in the development of the project proposal and keep records of the decisions made.
AICT 3.4	**Project proposal**	**Work individually to** Use the outcomes of the group analysis to prepare a project proposal and a project plan.
AICT 3.5	**Project definition**	**Work individually to:** Amend the project proposal and project plan as necessary to suit revised client requirements. Develop the project proposal to formally define the scope of the project detailing the purpose of the project, stakeholders, measurable objectives (outcomes, quality and completion), constraints and deadlines.
AICT 3.6	**Project organisation**	
	Procedures	Set up and use procedures for storing and protecting project information, tracking and monitoring progress.
	Stages	Define the project in terms of the stages of analysis, design, prototyping, testing, producing documentation and final handover and identify the activities that will be carried out in each stage. Recognise the relationships between these activities.
	Planning	Use appropriate software to produce a detailed plan showing overall timescale, project stages, the activities in each stage, timings for each activity, contingency time and review dates.

	Tracking and monitoring	Check progress against the plan, access the impact of any delays arising and adjust the plan to minimise their effect. Produce multiple copies of the plan as necessary to illustrate progress throughout the project.
	Project management software	Make effective use of project management tools such as Gantt charts, PERT charts, critical path analysis, network diagrams and time lines to facilitate the progress of the project.
AICT 3.7	**The Project**	
	Design	Design the structure of a numerical model in terms of layout, fonts, colour, borders, headers and footers and conditional formatting. Design the rules for the numerical model. Design the calculations and processes required to implement these rules. Design data entry facilities and validation rules to ensure the accurate entry of data into the numerical model. Design suitable methods of presenting results on screen and/or on paper such charts and graphs, tables and exporting to other application.
	Development	Implement the design using suitable numerical modelling software to produce a prototype for testing and review. Revise the prototype in response to feedback obtained from testing. Implement the revised design to create the final product.

	Testing	Produce a test plan and test data designed to fully test the numerical model. Implement the test plan and present the results.
AICT 3.8	**Review**	Carry out a review of the solution against initial objectives and success criteria of the project definition. Evaluate the completed model and consider potential future improvements. Evaluate the effectiveness of the project management software tools used in the course of the project. Describe strengths and weaknesses in own performance in the design and development stages of the project. Identify problems encountered during the design and development stages of the project and suggest how these could be avoided in future.
AICT 3.9	**ePortfolio**	Make use of a given eportfolio to present the required evidence of group work, project management, modelling and review.
AICT 3.10	**Standard ways of working**	
	Managing your work	Recognise the need to use sensible filenames and version control, setting up organised folder structures and choosing appropriate file formats.
	Keeping information secure	Recognise the need to save work regularly, make back ups, limit access and use effective virus protection.
	Quality assurance	Recognise the need to spell check and proof read work.

Assessment of this unit

This is a mandatory unit for the A Level.

The assessment of this unit is external, through the use of a controlled assessment written by the WJEC.

Controls for the Controlled Assessment

The controlled assessment document will outline specific details and will be available to centres via the secure website. The information below provides a general framework.

Task Taking

The controlled assessment will be available in September this provides the basis for a spreadsheet design for a given scenario undertaken by groups of candidates. A document called "revised requirements" will be issued subsequently and this provides the basis for individual project planning and spreadsheet revisions. Centres will have a window during which the individual aspect of the controlled assessment (15 hours) may be taken. The window will be approximately of 4 weeks duration and set in March and April. Actual dates for the window will be advised annually. Candidates will not have sight of the revised requirements until the centre commences the 15 hour task taking period during the window. Candidates will need to complete the controlled assessment under close supervision. No work may be taken into or out of the controlled environment.

Task Marking

Candidate work is to be marked internally and externally moderated.

Annotation of Controlled Assessments

This should be achieved by:

(i) Annotation of the candidate's work within the submission of the candidate's controlled assessment (on-line or CD)

OR

(ii) A separate attachment to the submission of the candidate's controlled assessment that provides a rationale for the awarding of candidate marks (on-line or CD)

OR

(iii) A written document provides a rationale for the awarding of candidate's marks (to accompany candidate work sent on CD)

Annotation is to help the moderator understand more fully how the teacher has arrived at the mark awarded to the candidate.

Internal Moderation of Controlled Assessments

Centres must ensure that careful moderation is carried out especially where more than one teacher is responsible for the marking of the controlled assessment. This is necessary to ensure uniformity of standards within a centre. Where internal moderation is necessary the teacher assuming overall responsibility for this process should provide a written outline of the procedures that have been adopted for the external moderator.

External Moderation of Controlled Assessments

The moderation of teacher assessment will be provided by inspection of the controlled assessment by WJEC. Centres will be informed of the submission date for the controlled assessment in the published Examinations Timetable and the name of their moderator will be issued in the term prior to accreditation.

The proportion of work to be moderated will be of the following order.

Total Number of Candidates	Work to be submitted (Numbers relate to rank order)
1 - 10	All
11 - 19	The first and every second (1, 3, 5, 7, etc.)
20 - 29	The first and every third (1, 4, 7, 10, etc.)
30 - 59	The first and every fourth (1, 5, 9, 13, etc.)
60 - 99	The first and every fifth (1, 6, 11, 16, etc.)
100 - 199	The first and every tenth (1, 11, 21, 31, etc.) plus additional folders to make a sample of 20.

Where more than one teacher has responsibility for marking the sample chosen should reflect this.

As a result of the moderation, the marks of candidates may be adjusted to bring the centre's marks into line with the national standard. If required, the moderator will ask for additional samples of work and if necessary, the work of all candidates may be called for and externally moderated regardless of entry numbers. In this case, all of the controlled assessments will be sent to the moderator.

It assists the moderation process considerably if the final marks of all the candidates are submitted to the moderator in rank order. It is only if this is done that the moderator can be fully aware of the full impact of any scaling.

In the event of concern over the awarding procedures, the normal appeals process will apply.

Authentication
Candidates will be required to confirm in writing, with any exceptions stated, that the work has been completed independently. This will be achieved by signing the appropriate part of the controlled assessment.

Teachers will be required to confirm in writing that, to the best of their knowledge, all the work submitted for moderation, with any exceptions stated, is the candidate's own unaided work. This will be achieved by signing the appropriate part of the controlled assessment.

Recording of Controlled Assessment Marks
Marks will be recorded on the WJEC electronic mark input system (IAMIS) The maximum mark to be recorded is 100.

Submission of Controlled Assessments
Candidate work may be sent in CD format or on-line.

Retention of Controlled Assessments
Centres need to retain the controlled assessments until the term following the Examination Series in which the controlled assessment was undertaken.

CANDIDATE REQUIREMENTS

Candidates will need to

- Work with others to
    - analyse the requirements of a given problem situation
    - to identify clear aims and objectives for the system
- Work individually to
    - Respond to changes in client requirements
    - Create a solution to the revised problem
    - Use project management software to track and monitor their progress

Candidates will need to work with others to produce

- An initial project proposal identifying
    - the client's requirements
    - all stakeholders
    - timescales and costs

Candidates will need to work individually to produce

- Revised project proposal
- Detailed problem definition
- Design, create, test and evaluate a computer model

All evidence, including the model itself, will be presented in the form of an ePortfolio.

The assessment objective weightings for this unit are as follows:

AO1	ICT Capability	30%
AO2	Knowledge and understanding	15%
AO3	ICT Problem solving	25%
AO4	Evaluation	30%

Assessment Grid

The following grid is to be used in conjunction with the WJEC devised assessment.

	Assessment Objective				
Section	**AO1**	**AO2**	**AO3**	**AO4**	**Total**
Project Definition			15		15
Project organisation	10	10		10	30
The project	15	5	10		30
Review				20	20
Presentation	5				5
Totals	**30**	**15**	**25**	**30**	**100**

PROBLEM DEFINITION - 15 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has presented a problem definition that includes • Notes on the group work carried out in preparation for the project, outlining the organisational procedures used and their own contribution • A definition that updates the scope and purpose of the project as stated in the group project proposal taking some account of given changes to the client's requirements. • Objectives for the project which indicate the success criteria to be used to assess the final outcomes.	The candidate has undertaken some analysis of the given problem and presented a problem definition that includes • A summary of the group work carried out in preparation for the project, which outlines the organisational procedures used by the group and clarifies their own contribution to the work. • A definition that accurately re-defines the scope and purpose of the project as stated in the group project proposal to take account of given changes in the client's requirements. • Some clear and measurable objectives for the project which define the success criteria to be used to assess the final outcomes.	The candidate has undertaken a comprehensive analysis of the given problem and presented a problem definition that includes • A clear and concise summary of the group work carried out in preparation for the project, which explains the organisational procedures used by the group and clarifies their own contribution to the work. • A comprehensive project definition that accurately re-defines the scope and purpose of the project as stated in the group project proposal to take full account of given changes in client's requirements. • A set of clear and measurable objectives for the project which clearly define the success criteria to be used to assess the final outcomes.
0 –7 marks	8 – 11 marks	12 - 15 marks

PROJECT ORGANISATION - 30 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced some evidence of project organisation and has • Set up and use procedures for storing project information that aid retrieval and data security • Used appropriate software to produce a plan showing overall timescale, most project stages, some activities in each stage and timings for each identified activity • Used the plan to communicate progress during the project • Used the plan to review and record changes in anticipated progress and account for initial contingencies • Made some use of appropriate project management tools to progress the project	The candidate has produced evidence of project organisation and has • Described how to set up and use procedures for storing project information that aid retrieval and data security • Used appropriate software to produce a plan showing overall timescale, project stages, activities in each stage and timings for each identified activity • Used and updated the plan to clearly communicate progress during the project • Made some evaluation of the likely impact of delays arising and has adjusted the plan to offset their effect and account for initial contingencies • Made use of appropriate project management tools to facilitate the progress of the project	The candidate has produced clear evidence of project organisation and has • Explained how to set up and use procedures for storing project information that aid retrieval, promote monitoring and support data security • Used appropriate software to produce a detailed plan showing overall timescale, activities in each stage, timings for each activity, contingency times and review points • Used and updated the plan as necessary to clearly communicate progress throughout the project • Fully evaluated the impact of delays arising and has adjusted the plan to minimise their effect and account for initial contingencies • Made effective use of a range of appropriate project management tools to facilitate the progress of the project
0 –14 marks	15 – 23 marks	24 – 30 marks

THE PROJECT - 30 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Produced a design for a numerical model that provides some indication of the layout and identifies some of the required content • Designed some rules and identified some of the calculations for use in the model making some use of facilities of the applications package • Included proposals for data entry facilities that are intended to facilitate data entry • Indicated methods for presenting some required outputs • Developed a working numerical model based on rules that make some use of formulae and functions • Produced a prototype and carried out limited testing • Produced a limited plan for testing, tested the model for correct operation and presented some results with some comments	The candidate has • Produced a design that for a numerical model that provides proposals for layout, formats, user interaction and some graphical content • Designed rules and identified calculations for use in the model, making some use of functions and formulae • Included proposals for data entry facilities that are intended to facilitate accurate data entry • Included proposals for presenting the required outputs • Developed a working model that is well formatted and based on rules that make use of formulae and functions • Produced prototypes, carried out testing and made some refinements • Produced a plan for testing the model for correct operation and presented results with suitable comments	The candidate has • Produced a comprehensive design for the structure of a numerical model that provides detailed proposals for layout, formats, user interaction and graphical content • Designed effective rules and identified calculations for use in the model, making good use of functions and formulae • Included proposals for data entry facilities and validation rules intended to facilitate data entry • Included clear proposals for the effective presentation of all required outputs • Developed a numerical model that is fit for purpose, well formatted and based on rules that make effective use of formulae and functions • Produced prototypes, carried out effective testing and refined the model accordingly • Produced a comprehensive plan for testing the model for correct operation and presented all results with informed commentaries
0 –14 marks	15 – 23 marks	24 – 30 marks

REVIEW - 20 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Made some evaluative comments about the model identifying some good and less successful features • Evaluated the main management tool used to progress the project • Commented on own performance in organising and managing the project identifying some strengths and/or weaknesses • Commented on the value of the preliminary group and the organisational methods used identifying some strengths and/or weaknesses • Provided evidence that conveys meaning but lacks detail. Little use of specialist vocabulary. The work may contain inaccuracies.	The candidate has • Evaluated the completed model against performance criteria and identified good and less successful features of the model and made some suggestions for improvements • Evaluated the management tools used to facilitate the progress of the project • Described both strengths and weaknesses in own performance in organising and managing the project and has made some suggestions for improvements • Evaluated the value of the preliminary group work, identifying both strengths and weaknesses of the organisational methods used and included some suggestions for improvements • Provided evidence that is structured clearly to communicate meaning. Technical vocabulary is used accurately. The work will contain relatively few errors.	The candidate has • Evaluated the completed model against performance criteria, identified good and less successful features of the model and described significant potential improvements • Evaluated in detail the effectiveness of the management tools used to facilitate the progress of the project • Described both the strengths and weaknesses in own performance in organising the project, including valid suggestions for future improvements • Evaluated the value of the preliminary group work, identifying both strengths and weaknesses of the organisational methods used and included valid suggestions for improvements • Provided evidence that is well structured and clearly expressed. Specialist terms are used with ease and accuracy. The work will be largely error free.
0 –10 marks	11 – 15 marks	16 – 20 marks

PRESENTATION - 5 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has presented • Some of the specified evidence, linked to the template provided, with few obvious errors and in the required formats	The candidate has presented • Most specified evidence, linked to the template provided, without obvious errors and in the required formats	The candidate has presented • All specified evidence, linked to the template provided, accurate and in the required formats, with no unnecessary work included
0 – 2 marks	3 – 4 marks	5 marks

AICT 4 – eStudio

ICT Marketing communications.

Introduction

In the eMarketplace, price alone cannot be the only factor when comparing similar products or service. The strength of product branding and image is critical.

Driving promotional campaigns to raise consumer awareness is necessary when marketing new or re-launching existing products or services. The effective eStudio must provide accurate information; communicate effectively with its audience whilst maintaining a superior product image whilst meeting their client's expectations.

The successful eStudio must be equipped with eCompetent employees complete with imagination, foresight and up to date graphics and multimedia skills.

Software requirements

To facilitate the successful completion of this unit, candidates will need access to the following:

- The Internet
- Web authoring software
- Pdf writing software
- Standard Office software
- Graphics packages with vector and bitmap tools
- Animation software
- Multimedia authoring software with facilities for editing video and sound

Content

	Focus	Amplification
		Candidates should be able to
AICT 4.1	**Background**	Describe methods that organisations use to promote their values, products and services such as advertising, sales promotion, public relations, direct marketing and sponsorship. Produce a requirements specification for a promotional campaign. Design, create and present a range of paper based and screen based promotional products for given purposes using appropriate graphic and multimedia authoring tools.
AICT 4.2	**Promotion**	
	Audience	Identify the needs of given audiences and ways in which they prefer to receive information.
	Purpose	Explain the purpose of promotion and its effect on the target audience in terms of achieving business objectives, raising awareness, providing information, communicating effectively, promoting a product and creating an image.
	Methods	Compare and contrast paper based methods used by organisations to promote products and services such as brochures, posters, billboards and flyers. Compare and contrast screen based methods used by organisations to promote products such as video trailers and advertisements, presentations and websites. Select and justify the use of appropriate methods to promote a given product or service.
AICT 4.3	**Requirements specification**	Analyse a given situation and produce a requirements specification for a promotional campaign that describes the purpose of the campaign, the methods to be used and how the effectiveness of the campaign will be judged.

AICT 4.4	**Graphic products**	Describe graphic products in terms of combinations of vector drawings, bitmap images and text.
	Vectors	Describe vector graphics in terms of coordinate structure, properties and behaviour. Compare vector graphics with bitmap graphics in terms of structure, properties and behaviour.
	Using vector tools	Create objects and control the properties of line type, thickness, colour, scale, size, orientation and position. Manipulate objects using methods such as group, ungroup, break apart, rotate, size, scale, skew, arrange, trace, duplicate and clone. Control separately properties of the stroke and fill. Control properties of text and dimensions. Apply effects to objects such as shadow, glow, bevel, emboss, patterns and gradients.
	Bitmaps	Describe bitmap graphics in terms of pixels, resolution, properties and behaviour. Compare bitmap graphics with vector graphics in terms of structure, properties and behaviour.
	Using bitmap tools	Create freehand images using pen and brush tools. Manipulate images using filters, borders and editing tools. Apply effects to objects such as shadows, gradients, blurs, glows, colour, hue and saturation.
	Design	Produce designs for vector drawings and bitmap based images recording sources for ideas and stimulus materials. Produce designs for graphic products that comprising appropriate combinations of text, vector drawings and bitmap images.

	Implementation	Implement the designs to produce prototypes for testing and review. Revise their designs in response to feedback obtained from testing. Implement the revised designs to create the final products.
AICT 4.5	**Multimedia products**	Describe multimedia products in terms of combinations of components such as text, graphics, sound, video and animation.
	Using multimedia tools	Create, capture and modify images, sound and video. Create animations and interactive components. Create hyperlinks and interactive environments. Optimise resolution and file size.
	Design	Produce designs for multimedia products and illustrate their ideas using appropriate methods such as structure diagrams, storyboards, timelines, flowcharts and content lists. Produce designs for external cascading style sheets (CSS) to control the presentation of the content of web pages. Using a recognise convention, present designs for JAVA Script routines such as code to display date and time, create interactive galleries, validate text entry and create pop-up alerts. Develop suitable structures for both linear and hierarchical products. Include proposals for user interactivity such as buttons, hyperlinks, hotspots, rollovers, menus, text boxes, radio buttons and check boxes. Include proposals for graphical features such as colours, background, borders, font styles and patterns. Include proposals for multimedia components such as ready-made and original images, video, sound and animation

	Preparation of multimedia components	Capture, create, manipulate and optimise images to ensure that they are fit for purpose using techniques such as filtering, re-colouring and cropping. Capture ready-made video, record original video and edit video to ensure that it is fit for purpose. Capture ready-made sound, record original sound and edit sound to ensure that it is fit for purpose. Create animation to enhance products such as transitions, animated gifs and tweening.
	Implementation	Implement the designs to produce prototypes for testing and review. Revise the prototypes in response to feedback obtained from testing. Implement the revised designs to create the final products.
AICT 4.6	**Overall review**	Carry out a review of the solution against the objectives identified in the requirements specification. Evaluate the campaign products and consider potential future improvements. Evaluate the effectiveness of the main tools and techniques used to create the campaign products. Describe strengths and weaknesses in own performance in the design and development stages of the project. Identify problems encountered during the design and development stages of the project and suggest how these could be avoided in future.

AICT 4.7 ePortfolio

Create an ePortfolio that complies with the given technical specification to present the designs and campaign products.

Present evidence of prototyping and testing and the final project review as part of the ePortfolio.

Demonstrate the ability to use text, graphics and multimedia tools to introduce the required evidence in an appropriate manner.

Demonstrate the ability to create suitable hyperlinks and navigational features to ensure that all evidence is readily accessible.

Ensure that all evidence can be viewed using web-browsing software.

Assessment of this unit

This is an optional unit for the A Level.

Candidates are required to develop a set of graphic and multimedia products to support a promotional campaign.

Candidates will need to identify

- Purpose and target audience (s) of the promotional campaign and a list of promotional products required for the campaign.
- Clear success criteria for the promotional products

Candidates will need to produce

- Evidence of initial design, development and testing
- The finished promotional products
- An eportfolio of evidence
- A review of the process and of their work.

For this unit the Awarding Body will be provide candidates with a Client's brief for a promotional campaign. The brief will identify the broad aims of the campaign.

Candidates will analyse the given brief and produce a series of graphic and multimedia promotional products for the campaign.

All evidence, including the final products, will be presented in the form of an ePortfolio.

The assessment objective weightings for this unit are as follows.

AO1	ICT Capability	30%
AO2	Knowledge and understanding	15%
AO3	ICT Problem solving	25%
AO4	Evaluation	30%

Assessment Grid The following grid is to be used with WJEC devised assessment.

	Assessment Objective				
Section	**AO1**	**AO2**	**AO3**	**AO4**	**Total**
Requirements specification		5			**5**
Design graphic products		5	5		**10**
Design multimedia products		5	5		**10**
Create graphic products	10		5	5	**20**
Create multimedia products	10		10	5	**25**
Review				20	**20**
Eportfolio	10				**10**
Totals	**30**	**15**	**25**	**30**	**100**

REQUIREMENTS SPECIFICATION 5 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • stated the purpose of the promotional campaign and identified some success criteria.	The candidate has • analysed the Client's brief, produced some measurable success criteria for the campaign and described proposals for testing the final products.	The candidate has • analysed the Client's brief, produced measurable success criteria for the campaign, related the criteria to the campaign objectives and described detailed proposals for testing the final products.
0 – 2 marks	3 – 4 marks	5 marks

DESIGN GRAPHIC PRODUCTS 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced designs for graphic products and has presented • Details of some sources and stimulus materials • Evidence of their initial design ideas for products • Evidence of their initial designs for identified elements.	The candidate has produced designs for graphic products that are sufficiently detailed to allow the designs to be implemented, and has presented • Details of sources and stimulus materials for each element/product. • Clear evidence of their initial design ideas, illustrating the progression of their ideas and identifying elements required for further development. • Clear evidence of their design ideas for the identified elements, illustrating the progression of their ideas and identifying tools and techniques required for further development.	The candidate has produced designs for graphic products that are appropriate for the intended audience and sufficiently detailed to allow the designs to be implemented, and has presented • A range of sources and stimulus materials for each element/product, clearly relating the sources to the designs. • Clear evidence of their initial design ideas, illustrating the progression of their ideas, explaining design decisions and identifying elements required for further development. • Clear evidence of their design ideas for the identified elements, illustrating the progression of their ideas, explaining design decisions and identifying tools and techniques required for further development.
0 – 5 marks	6 – 8 marks	9 - 10 marks

DESIGN MULTIMEDIA PRODUCTS 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced designs for multimedia products and has presented • Details of some assets, both ready made and original. • Evidence of their initial design ideas for products • Evidence of their initial designs for identified components.	The candidate has produced designs for multimedia products that are sufficiently detailed to allow the designs to be implemented, and has presented • Details of a range of assets, both ready made and original, for each product • Clear evidence of their initial design ideas, illustrated the progression of their ideas and identified components required for further development. • Clear evidence of their design ideas for identified components, illustrated the progression of their ideas and identified tools and techniques required for further development. • Evidence of a design to control some elements of the web pages appearance and through the use of CSS. • Evidence of the consideration of the use of JAVA Script to increase interactivity of web pages.	The candidate has produced designs for multimedia products that are appropriate for the intended audience and sufficiently detailed to allow the designs to be implemented, and has presented • Details of a range of potential assets, both ready made and original, and has clearly related the assets to the required products. • Clear evidence of their initial design ideas, illustrated the progression of their ideas, explained design decisions and identified components required for further development. • Clear evidence of their design ideas for identified components, illustrated the progression of their ideas, explained design decisions and identified tools and techniques required for further development. • Clear evidence of the design of CSS to control the appearance of web pages. • Clear evidence of the design for incorporating JAVA Script elements in web pages to improve interactivity.
0 – 5 marks	6 – 8 marks	9 - 10 marks

CREATE GRAPHIC PRODUCTS 20 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Made use of some vector tools in the creation of the identified graphic products. • Made use of some bitmap tools in the creation of the identified graphic products. • Produced prototypes and obtained limited feedback during the development of the identified graphic products. • Produced most of the identified graphic products. The products meet some of the requirements of the Client's brief.	The candidate has • Made good use of a range of vector tools in the creation of the identified graphic products. • Made good use of a range of bitmap tools in the creation of the identified graphic products. • Produced prototypes and obtained feedback at most stages in the development of the identified graphic products and has refined the products in response to feedback. • Produced all of the identified graphic products. The products meet most of the requirements of the Client's brief. The final products are fit for purpose and suitable for the identified audience(s).	• The candidate has • Made good use of a wide range of vector tools in the creation of the identified graphic products. • Made good use of a wide range of bitmap tools in the creation of the identified graphic products. • Produced prototypes and obtained feedback at all stages in the development of the identified graphic products and has refined the products in response to feedback or offered clear reasons where suggested changes have been discounted. • Produced all of the identified graphic products. The products meet all of the requirements of the Client's brief and include effective combinations of vector and bitmap elements. The final products are fit for purpose and suitable for the identified audience(s).
0 – 10 marks	11 – 15 marks	16 - 20 marks

CREATE MULTIMEDIA PRODUCTS 25 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Made use of a limited range of video editing tools in the creation of the identified multimedia components. • Made used of a limited range of sound editing tools in the creation of the identified multimedia components. • Made use of a limited range of animation in the creation of the identified multimedia components. • produced some prototypes and obtained limited feedback during the development of the identified multimedia products. • Produced most of the identified multimedia products. The products meet some of the requirements of the Client's brief.	The candidate has • Made good use of video editing tools in the creation of the identified multimedia components. • Made good use of sound editing tools in the creation of the identified multimedia components. • Made good use of animations in the creation of the identified multimedia components. • Produced prototypes and obtained feedback at most stages in the development of the identified multimedia products and has refined the products in response to feedback. • Produced all of the identified multimedia products. The products meet most of the requirements of the Client's brief. The final products are fit for purpose and suitable for the identified audience(s). • Used a CSS to structure web pages and JAVA Script elements to improve interactivity.	The candidate has • Made good use of a range of video editing tools in the creation of the identified multimedia components. • Made good use of a range of sound editing tools in the creation of the identified multimedia components. • Made good use of a range of animations in the creation of the identified multimedia components. • Produced prototypes and obtained feedback at all stages in the development of the identified multimedia products and has clearly refined the products in response to feedback or offered clear reasons where suggested changes have been discounted. • Produced all of the identified multimedia products. The products meet all of the requirements of the Client's brief and include effective combinations of components. The final products are fit for purpose and suitable for the identified audience(s). • Made effective use of external CSS to structure web pages • Embedded effective JAVA Script elements to enhance interactivity.
0 – 12 marks	13 – 19 marks	20 - 25 marks

REVIEW 20 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has provided • A brief evaluation of the main tools and techniques used to create the campaign products. • A brief evaluation of the products • An account of their own performance in the design and production of the campaign products. • Evidence that conveys meaning but lacks detail, with little use of specialist vocabulary. The work may contain inaccuracies.	The candidate has provided • An evaluation of the effectiveness of the main tools and techniques used to create the campaign products. • An evaluation of the products against the objectives identified in the requirements specification. • An account of potential improvements to the campaign products. • A description of both strengths and weaknesses in their own performance during the project. • An account of problems arising during the project. • Evidence structured clearly to communicate meaning. Technical vocabulary will be used accurately. The work will contain relatively few errors.	The candidate has provided • A detailed evaluation of the effectiveness of the tools and techniques used to create the campaign products. • A detailed evaluation of the products against the objectives identified in the requirements specification. • A description of significant potential improvements to the campaign products. • A description of both strengths and weaknesses in their own performance in the design and production of the campaign products. • A description of specific changes of approach that would be adopted in future to avoid problems experienced during the project. • Evidence structured and clearly expressed. Specialist terms will be used with ease and accuracy. Work will be largely error free.
0 – 10 marks	11 – 15 marks	16 - 20 marks

ePORTFOLIO 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced an eportfolio that • Comprises a series of pages that are easily viewed on screen. • Allows access to the promotional products and most of the supporting evidence.	The candidate has produced an eportfolio that • Provides a context for the promotional products and supporting evidence, with most of the content prepared to facilitate viewing on screen. • Allows access to the promotional products and supporting evidence. • Is accurate and suitable for the intended audience.	The candidate has produced an eportfolio that • Provides a context for the promotional products and supporting evidence, with all of the content prepared to facilitate viewing on screen. • Is fully functional and allows access to the promotional products and supporting evidence. • Is accurate, well designed, consistently presented and clearly matched to the intended audience.
0 – 5 marks	6 – 8 marks	9 - 10 marks

AICT 5 – eCode

Producing Software Solutions.

Introduction

Computer coding is the universal language of the planet. People who know how to code will be able to communicate across countries and cultures, be innovative, and solve problems more efficiently, with no barriers to impede their success.

Software requirements

To facilitate the successful completion of this unit, candidates will need access to the following:

- The Internet
- Web authoring software
- Pdf writing software
- Standard Office software
- High level programming language application

Content

	Focus	Amplification
		Candidates should be able to
AICT 5.1	**Background**	Describe different types of programming languages and their translation.
		Explain the benefits of structured programming. Analyse the main characteristics and features of contemporary software packages.
		Design, develop, test and document a structured program to create a software package.
AICT 5.2	**Programming**	
	Types of programming languages	Distinguish between high level language and low level language.
	Language characteristics	Compare and contrast the main characteristics of imperative and declarative programming languages.
		Describe the features of contemporary high level procedural and object oriented programming languages.
		Explain that mark up languages such as HTML are a series of instructions that only describe the structure of a document and therefore are not true programming languages.
	Program translation	Explain the function of translation programs in producing source code that is executable by the computer.
		Describe the purpose and distinguish between compilers and interpreters.
		Distinguish between, recognise and give examples of translation and execution errors.

	Structured programming	Explain the concept of modular design as a method of organising a computer program into self-contained parts that can be developed independently. Explain the nature, purpose and possible benefits of the use of standard modules and sub program libraries. Use top down programming methods to develop the software package.
	Programming constructs	Identify, explain and code the main programming structures of sequence, iteration and selection using techniques such as For…Next, If...Then, Do…While, Do…Until, Case and Loops.
	Variables and constants	Identify the scope of variables and use constants and variables in sub routines and programs.
	Data manipulation	Explain and use processes involving the handling of strings and numbers and the use of logical operations.
	Data types and structures	Describe and use the primitive data types of character, string, integer, real and Boolean. Identify, justify and use correct data structures for specific situations. Explain and manipulate records and/or arrays of up to three dimensions.
	File organisation and access	Describe and use serial, sequential and direct file organisation and access as appropriate. Describe the need for and provide facilities for file security and backup.
AICT 5.3	**Problem Definition**	Research similar comercially available solutions Analyse the given scenario in terms of input, processing and output Set objectives, including measurable success criteria for the proposed system

AICT 5.4	**Design**	
	Data structures	Design each required data structure and file and include details of data types and access methods.
	Input	Design input screens and dialogue boxesthat are suitable for the given scenario.
	Interface	Design an appropriate user interface including facilities to aid accurate data entry.
	Output	Design output content and format that are suitable for the given scenario
	Processing	Present algorithms, in a structured format, for the required processing stages and validation routines.
AICT 5.5	**Software development**	Implement the design to produce a prototype for testing and review. Revise the prototype in response to feedback obtained from testing. Implement the revised design to create the final product.
AICT 5.6	**Testing**	Produce plans and data for summative testing of the solutions. Implement the plans and present and discuss test results.
AICT 5.7	**Documentation**	
	Tutorial	Produce a screen-based tutorial to provide the end user with clear instructions on how to use the completed solution.
	Technical	Produce an annotated listing of the programming code with details of sub routines.

AICT 5.8	**Review**	Carry out a review of the solution against the objectives identified in the problem definition. Evaluate the software package and consider potential future improvements. Evaluate the effectiveness of the programming language and techniques used to create the software package. Describe strengths and weaknesses in own performance in the design and development stages of the project. Identify problems encountered during the design and development stages of the project and suggest how these could be avoided in future.
AICT 5.9	**ePortfolio**	Create an ePortfolio that complies with the given technical specification to present the design and outcomes of the project. Present the test plan, test data, test results and the final project review as part of the ePortfolio. Demonstrate the ability to use text and graphics to introduce the required evidence in an appropriate manner. Demonstrate the ability to create suitable hyperlinks and navigational features to ensure that all evidence is readily accessible. Ensure that all evidence can be viewed using web-browsing software.

Assessment of this unit

This is an optional unit for the A Level.

Candidates are required to develop a solution to a given scenario using a high level programming language.

Candidates will need to identify

The requirements for the given scenario

Commerically available solutions

Clear aims and objective for the system

Candidates will need to produce

Evidence of system design, development and testing

The finished system

User and technical documentaton

A review of the process and of their work.All evidence, including the solution itself, will be presented in the form of an ePortfolio.

The assessment objective weightings for this unit are as follows.

AO1	ICT Capability	30%
AO2	Knowledge and understanding	15%
AO3	ICT Problem solving	25%
AO4	Evaluation	30%

Assessment Grid The following grid is to be used in the development and assessment of coursework.

	Assessment Objective				
Section	**AO1**	**AO2**	**AO3**	**AO4**	**Total**
Problem Definition		5			**5**
Design a software package		5	10	5	**20**
Create a software package	15		10		**25**
Tutorial	5	5			**10**
Test a software package			5	5	**10**
Review				20	**20**
Eportfolio	10				**10**
Totals	**30**	**15**	**25**	**30**	**100**

PROBLEM DEFINITION 5 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has presented a problem definition that • Identifies the main aims and limitations of the solution of a given scenario.	The candidate has undertaken some analysis of current practice and presented a problem definition that • Identifies broad aims and limitations of the solution of a given scenario based on the analysis. • Includes some criteria for the evaluation of the finished solution	The candidate has undertaken a comprehensive analysis of current practice and presented a problem definition that • Provides a full description of the broad aims and limitations of the solution of a given scenario based on this analysis. • Includes clear and measurable criteria for the evaluation of the finished solution
0 – 2 marks	3 – 4 marks	5 marks

DESIGN A SOLUTION 20 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced designs for a solution and has presented • A basic structure diagram showing how the different parts of the system (screens) will relate to each other. • Some details of the required data structure(s). • A list of the required inputs to the system. • Proposals for output • Some of the processes and routines required to create a working system.	The candidate has produced a design for a solution that is sufficiently detailed to allow the system to be implemented and has presented • A clear structure diagram showing how the different parts of the system screens will relate to each other with proposals for navigation. • All the required data structures with suitable fieldnames, data types and key fields. • A specification of the required inputs to the system and a description of the method of input • A specification of the required output(s) and the intended layout of screens/documents to be generated. • Most of the processes and routines required to create a working system, with some review of the relationships between the data and the processes and routines. • An evaluation of the design against the criteria laid down in the problem definition.	The candidate has produced a design for a solution that is appropriate for the intended audience and sufficiently detailed to allow the system to be implemented, and has presented • A clear structure diagram showing how the different parts of the system screens will relate to each other with proposals for navigation, user interaction and graphic content. • All the required data structures with suitable fieldnames, data types, key fields, validation rules and methods of access. • A detailed specification of the required inputs to the system including data sources and a description of the method of input. • A detailed specification of the required output(s) and the intended layout of screens/documents to be generated. • All the processes and routines needed to provide an effective working system with a clear description of the relationships between the data and the processes and routines. • A detailed evaluation of the design against the criteria laid down in the problem definition.
0 – 10 marks	11 – 15 marks	16 - 20 marks

CREATE A SOLUTION 25 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has created a solution that • Has limited functionality. • Demonstrates some awareness of the target audience. • Includes structures to store information • Provides simple input formats for data entry that allow the user to interact with the system. • Incorporates output that communicates progress to the user. • Utilises some of the facilities of a programming language. • Includes a program listing with some annotation	The candidate has created a solution that • Is generally functional and easy to use. • Demonstrates good awareness of the target audience. • Includes structures required to store information for the recording and assessment of the learning and maintain user logs of individual learner details. • Provides suitable input formats that facilitate accurate data entry and allow the user to interact with the system. • Incorporates facilities for the generation of output that responds to user input and communicates progress. • Utilises a range of the facilities of a programming language. • Includes an annotated program listing with use of self-documenting identifiers.	The candidate has created a solution that • Is fully functional and easy to use. • Is well matched to the target audience and uses the medium to engage the user. • Includes efficient structures required to store all information for the recording and assessment of the learning, maintain user logs of individual learner details and allow learner progress to be tracked and analysed. • Provides suitable input formats that facilitate accurate data entry, control content and allow the user to interact with the system. • Incorporates facilities for the generation of high quality output that responds to user input, communicates progress and provides appropriate guidance to the user. • Fully exploits, as appropriate, the facilities of the programming language. • Includes a well-annotated program listing(s) with use of self-documenting identifiers and program code structured to facilitate efficient future maintenance.
0 – 12 marks	13 – 19 marks	20 - 25 marks

TUTORIALS 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced • A screen-based tutorial to give information to users of the system. • A listing with annotation of the main features of the solution.	The candidate has produced • A well structured screen-based tutorial to give information to users of the system that uses a variety of on-screen techniques. • An annotated listing with code including self identifiers.	The candidate has produced • A comprehensive and well structured screen-based tutorial to give information to users of the system that uses a wide variety of on-screen techniques and includes full navigation. • Annotated code that makes good use of self identifiers, indentation and white space.
1 – 5 marks	6 – 8 marks	9 - 10 marks

TESTING 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has presented • A plan to test most parts of the system. • Evidence of testing some of the functions of the finished system.	The candidate has presented • A plan to test most parts of the system with typical, extreme or erroneous data. • Evidence of testing most of the functions of the completed system, with comments describing the main features of the testing process.	The candidate has produced • A comprehensive plan to test all parts of the system with typical, extreme and erroneous data. • Evidence of thorough testing of the completed system based on the test plan with an informed commentary on the testing process.
0 – 5 marks	6 – 8 marks	9 - 10 marks

REVIEW 20 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced • A brief evaluation of the programming language used to create the solution system. • Comments on their own performance in the design and production of the solution system. • Evidence that conveys meaning but lacks detail, with little use of specialist vocabulary. The work may contain inaccuracies.	The candidate has produced • An evaluation of the programming language used to create the solution system. • Some comparisons with similar systems and/or current manual methods identifying good and less good features of both. • An account of their own performance in the design and production of the solution system. • Comments on problems arising during the project. • Evidence structured clearly to communicate meaning. Technical vocabulary will be used accurately. The work will contain relatively few errors.	The candidate has produced • A detailed evaluation of the effectiveness of the programming language used for the creation of the solution system. • A comparison of the software system with similar systems and/or current manual methods, describing significant potential improvements to their own work. • A description of both strengths and weaknesses in their own performance in the design and production of the solution system. • Comments on specific changes of approach that would be adopted in future to avoid problems experienced during the project. • Evidence structured and clearly expressed. Specialist terms will be used with ease and accuracy. Work will be largely error free.
0 – 10 marks	11 – 15 marks	16 - 20 marks

ePORTFOLIO 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced an eportfolio that • Comprises a series of pages that are easily viewed on screen. • Allows access to most of the solution and supporting evidence.	The candidate has produced an eportfolio that • Provides a context for the solution and supporting evidence, with most of the content prepared to facilitate viewing on screen. • Allows access to most of the solution and supporting evidence. • Is accurate and suitable for the intended audience.	The candidate has produced an eportfolio that • Provides a context for the solution and supporting evidence, with all of the content prepared to facilitate viewing on screen. • Is fully functional eportfolio and allows access to all sections of the solution and supporting evidence. • Is accurate, consistently presented and clearly matched to the intended audience.
0 – 5 marks	6 – 8 marks	9 - 10 marks

Unit 6 – eTransact

Selling and ICT.

Introduction

eTransactions are already commonplace in the world of eCommerce. Buying and selling over the Internet is becoming second nature to the many people.

Effective eBusinesses need competent web designers and database managers as it is the database that works behind the scenes of the website, holding stock data, customer details and order processing data.

eBusinesses need efficient back-office systems that ensure that the product ordered reaches its destination rapidly. All of this without the overheads of expensive retail space certainly makes this an exceptionally competitive environment.

To compete in the world of eCommerce - you need eSkills!

Software requirements

To facilitate the successful completion of this unit, candidates will need access to the following:

- The Internet
- Web authoring software
- Pdf writing software
- Standard Office software
- Relational database management software
- Graphics packages with vector and bitmap tools
- Animation software
- Multimedia authoring software with facilities for editing video and sound

Content

	Focus	Amplification
		Candidates should be able to:
AICT 6.1	**Background**	Describe the advantages, potential risks and current legislation associated with eCommerce. Analyse existing transactional websites and investigate associated back office processes. Design, create, test and document a transactional website, supporting data structures and processes.
AICT 6.2	**eCommerce**	Describe eCommerce and explain the main processes in selling and purchasing goods in this way. Explain the advantages of eCommerce for businesses such as low setup and running costs (brick versus click) worldwide presence and 24/7 operation. Explain the advantages of eCommerce for customers such as convenience, wider selection of goods and the ability to compare prices. Describe the potential risks of eCommerce for businesses such as increased competition and fraud. Describe the potential risks of eCommerce for customers such as impulse buying and identity the
AICT 6.3	**Cybersecurity**	Describe the importance of using a secure computer or mobile device when carrying out transactions over the Internet. Explain the importance of keeping software up to date including web browsers, anti-malware software and firewall. Explain why online shoppers should avoid using unknown or unsecured networks. Explain why online shoppers should protect all user accounts with strong and frequently changed passwords.

AICT 6.4	**Transactional websites**	Analyse and evaluate relevant examples of transactional websites and identify their main features and characteristics. Describe back office functions that support the operation of a transactional website in terms of the information processing required for maintaining customer and product details, orders and payments. Describe measures taken to customise the presentation of information on transactional websites to suit individual customers.
AICT 6.5	**Legislation**	Describe the protections provided by current legislation governing e-Commerce in the areas of data protection and distance selling.

AICT 6.6	**Design**	
	Structure and layout	Design a structure for a transactional website and produce layouts for web pages that provide information on the advantages of e-Commerce and details of customer privacy issues, present products, capture customer and transaction details, compile orders and make payments.
	Data structures and input formats	Design data structures to store customer, product and transactional information such as orders and payments. Design appropriate formats to control input such as text boxes, lists, check boxes and buttons.
	Validation	Design validation routines to minimise error.
	Output	Design output that provides confirmation of the transaction to the customer that is external to the website.
	Processing stages	Identify and design the processes required to purchase multiple items in a single transaction.
AICT 6.7	**Software development**	Implement the designs to produce a prototype for testing and review. Revise the prototype in response to feedback obtained from testing. Implement the revised design to create the final product.
AICT 6.8	**Testing**	Produce a plan for the summative testing of the system for correct operation including navigation, data capture, storage and retrieval, validation, maintenance of shopping basket, calculation of payments and production of outputs. Implement the plan, present and discuss the test results.

AICT 6.9	**Review**	Compare and contrast the completed transactional website with commercial sites produced for similar purposes. Identify the good and less effective features of both. Evaluate the software used and discuss potential improvements to the completed system. Evaluate the security of the completed system and identify ways in which this could be enhanced. Describe strengths and weaknesses in own performance in the design and development stages of the project. Identify problems encountered during the design and development stages of the project and suggest how these could be avoided in future.
AICT 6.10	**ePortfolio**	Create an ePortfolio that complies with the given technical specification to present the design and completed system. Present the test plan, results of testing and the final project review as part of the ePortfolio. Demonstrate the ability to use text and graphics to present the required evidence in an appropriate manner. Demonstrate the ability to create suitable hyperlinks and navigational features to ensure that all evidence is readily accessible. Ensure that all evidence can be viewed using web-browsing software.

In addition to providing product information and supporting transactions the developed web pages should:

- Sell the advantages of purchasing on-line.
- Advise users on potential risks.
- Include a privacy policy with an outline of the associated legislation.

Assessment of this unit

This is an optional unit for the A Level.

Candidates are required to develop a transactional website for a given scenario using appropriate web authoring and data handling software

Candidates will need to identify

The requirements of the given scenario and contemporary methods for its delivery

Clear aims and objectives for the system

Candiates will need to produce

Evidence for system design, development and testing

The finished system

A review of the process and of their work.

A designed and created eportfolio to present the finished website together with supporting design work and evaluations

The transactional website must have a developed HCI with graphic content and provide facilities for the capture, manipulation and retrieval of all information required to carry out transactions.

More advanced solutions will all customers to purchase multiple items in a single transaction The solution should provide information relating to issues raised through distance selling and should include pages to inform users of related privacy and security issues.

All evidence, including the package itself, will be presented in the form of an ePortfolio.

The assessment objective weightings for this unit are as follows.

AO1	ICT Capability	30%
AO2	Knowledge and understanding	15%
AO3	CT Problem solving	25%
AO4	Evaluation	30%

Assessment Grid

The following grid is to be used in the development and assessment of coursework.

	Assessment Objective				
Section	**AO1**	**AO2**	**AO3**	**AO4**	**Total**
Design an eTransact system		5	15		**20**
Create an eTransact system	20	5	10		**35**
Test an eTransact system				10	**10**
Customer advice and cybersecurity		5		5	**10**
Review				15	**15**
Eportfolio	10				**10**
Totals	**30**	**15**	**25**	**30**	**100**

DESIGN AN eTransact SYSTEM 20 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced • Designs for the layout of a website intended to present product information and enable transactions. The design includes information on how the pages relate to each other • Designs for the storage of some of the information required for transactions to be completed • Designs for input formats for data entry facilities that are intended to facilitate data entry • Designs for methods for presenting some required outputs • Algorithms for the manipulation if some of the information required for a single transaction	The candidate has produced • Designs for the layout of a website intended to present product information and enable transactions. The design includes a clear structure diagram illustrating how the pages will relate to each other and proposals for navigation • Designs for the structure and storage of all information required for transactions to be completed • Designs for input formats for data entry facilities that are intended to facilitate accurate data entry • Designs for proposals for presenting the required outputs • Algorithms in suitable formats for the capture, manipulation and retrieval of information required for a single transaction	The candidate has produced • Designs for the layout of a website intended to present product information, promote use confidence and enable efficient transaction. The design provides all the information required to create the website including clear structure diagrams, proposals for navigation, user interaction and graphic content • Detailed designs for the structure and efficient storage of all information required for transactions to be completed • Designs to input formats for data entry facilities and validation rules intended to facilitate data entry • Designs for the effective presentation of all required outputs • Algorithms in suitable formats for the capture, manipulation and retrieval of all information required for the purchase of multiple items in a single transaction
0 –10 marks	11 – 15 marks	16 - 20 marks

CREATE AN eTransact SYSTEM 35 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has created • A functional website comprising a series of web pages designed to present products and enable transactions • Structures to store some of the information required for transactions to be completed • Simple input formats that allow data entry • A facility for the generation of some automated output • Functioning and annotated routines for the capture , manipulation and retrieval of some information for a single transaction	The candidate has created • A functional website comprising a series of well structured pages that present products and enable transactions • Structures to store all information required for transactions to be completed • Suitable input formats that facilitate date entry • Facilities for the validation of some input • A facility for the generation of automated output • Functioning and clearly annotated routines for the capture, manipulation and retrieval of all information required for a single transaction	The candidate has created • A fully functional, easy to navigate website comprising a series of well structured web pages that present product information effectively, promote user confidence and enable efficient transactions • Efficient structures to store all information required for transactions to be completed • Suitable input formats that facilitate data entry and content control • A suitable range of validation routines that limit input errors • Fully functioning facilities for the generation of high quality automated output • Fully functioning and clearly annotated routines for the capture, manipulation and retrieval of all information required for the purchase of multiple items in a single transaction
0 –17 marks	18 – 26 marks	27 - 35 marks

TEST AN eTransact SYSTEM 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Produced prototypes and obtained limited feedback during the development of the website • Produced a plan for testing most areas of the system for correct operation and presented some results	The candidate has • Produced prototypes and obtained feedback at most stages in the development of the website and has made changes to the page designs in response to feedback • Produced a plan for testing most areas of the system for correct operation and present results with suitable commentary	The candidate has • Produced prototypes and obtained feedback at all stages in the development of the website and has refined the page designs in response to feedback of has offered clear reasons where suggested changes have been discounted • Produced a comprehensive plan for testing all areas of the system for correct operation and presented all results with suitable commentary
0 –5 marks	6 – 8 marks	9 - 10 marks

CUSTOMER ADVICE and CYBERSECURITY 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Identified some of the advantages of eCommerce and presented this information via the website • Identified some risks associated with eCommerce and presented this information via the website • Produced notes on privacy and the use of transactional websites and presented this information via the website • Produced notes on some aspects of current legislation related to the use of transactional websites and presented this information via the website • Produced notes on the risks associated with purchasing goods online and outlined some steps that can be taken to protect the consumer	The candidate has • Identified the advantages of eCommerce to businesses and their customers and presented this information via the website • Produced a summary of the potential risks associated with eCommerce to businesses and their customers and presented this information via the website • Produced a privacy policy related to the use of transactional websites and presented this information via the website • Produced a summary of some aspects of the current legislation related to the use of transactional websites and presented this information via the website • Produced a summary of the issues concerning cybersecurity and outlined the measures that the user should be taken to protect themselves when purchasing goods over the Internet.	The candidate has • Produced a concise summary of the range of advantages of eCommerce to businesses and their customers and presented this information clearly via the website • Produced a concise summary of potential risks associated with eCommerce to businesses and their customers and presented this information clearly via their website • Produced a comprehensive privacy policy related to the use of transactional websites and presented this clearly via the website • Produced a concise summary of the main aspects of current legislation related to the use of transactional websites and presented this information clearly via the website • Produced a comprehensive guide on issues concerning cybersecurity and the measures that the user should be taken to protect the themselves when purchasing goods over the Internet.
0 –5 marks	6 – 8 marks	9 - 10 marks

REVIEW 15 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has • Produced a brief evaluation of the main software packages used to create the transactional website • Made some comparisons with published transactional websites and identified some possible improvements • Made some comparisons, regarding security, with published transactional website • Produced an account of own performance in the design and creation of a transactional website • Produced an account of problems arising out of the project work • Produced a review that conveys meaning but will lack detail. There is little use of specialist vocabulary. The work may contain inaccuracies	The candidate has • Produced an evaluation of the effectiveness of the main software packages used to create the transactional website • Compared the completed website with similar published transactional websites, identified some good features of both and described some potential improvements • Compared the security features of the website with the security features of similar published transactional websites • Described strengths and weaknesses in own performance in the design and creation of the transactional website • Produced an account of problems arising out of the project work and suggested strategies for improvement • Produced a review that is structured clearly to communicate meaning. Technical vocabulary has been used accurately. The work contains relatively few errors.	The candidate has • Produced a detailed evaluation of the effectiveness of the range of software used for the creation of the transactional website • Compared the completed website with similar published transactional websites, identified good and less good features of both and described significant potential improvements • Compared the security features of the website with the security features of similar published transactional websites and described significant potential improvements • Described strengths and weaknesses in own performance in the design and creation of the transactional website and suggested valid improvements • Described specific changes of approach that would be adopted in future to avoid problems experienced during the project • Produced a well structured and clearly expressed review. Specialist terms have be used with ease and accuracy. Work is largely error free.
0 –7 marks	8 – 11 marks	12 - 15 marks

ePORTFOLIO 10 marks		
Mark Band 1	Mark Band 2	Mark Band 3
The candidate has produced an eportfolio that • Comprises a series of pages that are easily viewed on screen • Allows access to most of the eTransact system • Contains evidence that is accurate and suitable for the intended audience	The candidate has produced an eportfolio that • Provides a context for the eTransact system and supporting evidence. Most of the work has been prepared to facilitate viewing on screen • Is functional and allows access to the eTransact system and most supporting evidence • Contains evidence that is accurate, well presented and takes some account of the intended purpose and audience	The candidate has produced an eportfolio that • Provides a context for the eTransact system and supporting evidence. All work has been prepared to facilitate viewing on screen • Is fully functional and allows access to all sections of the eTransact system and all supporting evidence • Contains evidence that is accurate, consistently presented and clearly matched to the intended audience
0 –5 marks	6 – 8 marks	9 - 10 marks

5 SCHEME OF ASSESSMENT

Details of the assessment arrangements for each unit are given in the Content section. The assessment structure for each qualification available through this specification can be summarised as follows :

Unit and Name	Status	Assessment
1. eBusiness	Mandatory AS/A Level (40%/16%)	**External:** 3 hour on-screen examination
2. eSkills	Mandatory AS/A Level (60%/24%)	**Internal:** Awarding Body devised assessment
3. eProject	Mandatory A Level (24%)	**External:** controlled assessment
4. eStudio	Optional (Select either unit 4, 5 or 6) A Level (36%)	**Internal:** Awarding Body devised assessment
5. eCode	Optional (Select either unit 4, 5 or 6) A Level (36%)	**Internal:** Awarding Body devised assessment
6. eTransact	Optional (Select either unit 4, 5 or 6) A Level (36%)	**Internal:** Awarding Body devised assessment

Quality of written communication

Candidates are required to demonstrate their “quality of written communication". In all units (with the exception of unit 1 - an examination with an associated mark scheme), the criteria for the quality of written communication have been integrated into the mark bands of each unit.

There is generally an expectation that:

- A/B candidates will have expressed complex ideas clearly and fluently. Sentences and paragraphs follow on from one another smoothly and logically. Arguments will be consistently well structured. There will be few, if any, errors of grammar, punctuation and spelling.

- E/U candidates will have expressed simple ideas clearly, but may express complex and subtle concepts ineffectively. Arguments may be obscurely presented. Errors in grammar, punctuation and spelling may be present.

Synoptic assessment

Synoptic assessment, the testing of candidates’ understanding of the connections between the different elements of the subject, is a requirement of all A level specifications. The assessment of unit 3 is through a controlled assessment which requires candidates to place ICT within the broad context of a project planning activity. Units 2, 4 & 6 are all internally assessed and require candidates to adopt a holistic approach. They will be required to draw upon their knowledge and understanding gained from studying other units and work in a multi-disciplined way that draws together various aspects of ICT.

Awarding, reporting and re-sitting

The AS qualification will be graded on a five-grade scale: A, B, C, D and E.

The A level qualification will be graded on a six-grade scale: A*, A, B, C, D, E

At A level, Grade A* will be awarded to candidates who have achieved a Grade A in the overall A level qualification and 90% of the total uniform marks for the A2 units.

Candidates who fail to reach the minimum standard for Grade E are recorded as U (Unclassified) and do not receive a certificate.

A qualification may be taken more than once. However, if any unit has been attempted twice and a candidate wishes to enter the unit for the third time, then the candidate will have to re-enter all units and the appropriate cash-in(s). This is referred to as a 'fresh start'. When retaking a qualification (fresh start), a candidate may have up to two attempts at each unit. However, no results from units taken prior to the fresh start can be used in aggregating the new grade(s).

Marks for NEA (internal assessment) units may be carried forward for the life of the specification. If a candidate has been entered for but is absent for a unit, the absence does not count as an attempt. The candidate would, however, qualify as a resit candidate.

Uniform Mark Scale

AS

	Max. UMS	A	B	C	D	E
Unit 1 (weighting 40%)	80	64	56	48	40	32
Unit 2 (weighting 60%)	120	96	84	72	60	48
AS	**200**	**160**	**140**	**120**	**100**	**80**

A Level

	Max. UMS	A	B	C	D	E
Unit 1 (weighting 16%)	80	64	56	48	40	32
Unit 2 (weighting 24%)	120	96	84	72	60	48
Unit 3 (weighting 24%	120	96	84	72	60	42
Unit 4/5/6 Weighting 36%	180	144	126	108	90	72
A Level	**500**	**400**	**350**	**300**	**250**	**200**

6 WELSH BACCALAUREATE

In following this specification, learners should be given opportunities, where appropriate, to develop the skills that are being assessed through the Skills Challenge Certificate within the Welsh Baccalaureate:

- Literacy
- Numeracy
- Digital Literacy
- Critical Thinking and Problem Solving
- Planning and Organisation
- Creativity and Innovation
- Personal Effectiveness.