Applied AS/A Level GCE

Teachers' Handbook

GCE in Applied ICT

OCR Advanced Subsidiary GCE in Applied ICT H115

OCR Advanced Subsidiary GCE in Applied ICT (Double Award) H315

OCR Advanced GCE in Applied ICT H515

OCR Advanced GCE in Applied ICT (Double Award) H715

This handbook is designed to accompany the revised OCR GCE in Applied ICT specification.

Contents

Introduction

These specifications are designed to provide candidates with an introduction to Applied ICT.

These specifications are set out in the form of units. Each teaching unit is assessed by its associated unit of assessment. Guidance notes are provided with these specifications to assist teachers in understanding the detail necessary for each unit.

It is important to make the point that the Teacher Support plays a secondary role to the Specification itself. The Specification is the document on which assessment is based and specifies what content and skills need to be covered in delivering the course. At all times, therefore, this teacher support should be read in conjunction with the Specification. If clarification on a particular point is sought then that clarification should be found in the Specification itself.

OCR recognises that the teaching of this qualification will vary greatly from school to school and from teacher to teacher. With that in mind, this Teacher Guide/Notes for Guidance is offered as guidance but will be subject to modifications by the individual teacher.

Unit G040 : Using ICT to Communicate

Guidance on Delivery

The original communications may be produced in response to a scenario or while candidates are working on other units. Care is needed to ensure that the communications created are not only for different purposes but also that they can be communicated by different methods; screen-based presentations and web pages should be considered as well as paper-based communications. Candidates will need to practise their skills and produce many documents before they are ready to produce their best-quality work for their portfolios.

The importance this unit attaches to accuracy and suitability should ensure that candidates spend much time thinking about the quality of what they wish to communicate and then presenting it simply and clearly. The content of documents is the key to their importance. This unit focuses on the quality of that content but candidates also learn from experience and guidance how to improve their presentations by using techniques like white space.

Acquaintance with documents from different organisations enables candidates to examine the quality of communication for a wide range of different types of document. There are numerous real examples of business documents that are stilted, tortuous or simply ineffective. It may be useful to build a bank of business clichés extracted from business documents, for candidates to translate into plain English. Typical documents are:

- bills;
- letters advertising financial products, such as credit cards and investments;
- mail-order forms and letters;
- instructions for operating domestic equipment;
- conditions of contracts, such as for credit cards, digital TV or credit agreements;
- insurance documents, letters and conditions;
- advertisements in newspapers and magazines.

While candidates need to spend a lot of time practising techniques, they need also to discover tools that can improve their writing. They need to configure grammar checkers to use different writing styles and then use them to check a written document to see if each gives a different response.

Tasks should not become checklists for techniques. The key to success is for candidates to use a variety of suitable techniques and use them sensibly. A wide choice of documents will ensure variety, but there is no need to use *every* technique listed in the ‘Styles of Presentation’ Section for this unit.

Group work brings enormous benefits to candidates. They could work in a group to collect documents, with each candidate contributing several cuttings or pamphlets and a critique of what they have collected. A discussion should help to generate ideas about what constitutes good and bad style. There should be no problem about authenticity if each candidate writes individual comments on a sample of the group’s collection. When linked to presentational techniques, these activities should help candidates to write and present their work clearly, succinctly and effectively.

Resources

Organisations

Plain English Campaign
PO Box 3
New Mills
High Peak
SK22 4QP

Text books

Lawson J (ed)	*Vocational A-Level Information and Communication Technology*	Pearson Education Ltd	058 235 709 8
Richards RP & Heathcote PM	*AVCE Units 1-3*	Payne-Gallway	190 311 229 X
Richards RP & Vincent JM	*Further Word 2000-2002*	Payne-Gallway	190 446 703 2
K Mary Reid (Ed)	*AS Level Applied ICT Single Award for OCR*	Heinemann	978 0 435449 97 1

Websites

http://desktoppub.miningco.com/
http://esl.about.com/cs/onthejobenglish/a/a_basbletter.htm
http://www.dti.gov.uk/bestpractice/
http://www.dti.gov.uk/bestpractice/assets/mobile.pdf
http://www.fastrak-consulting.co.uk/tactix/features/commopts/comopt02.htm
http://www.io.com/~hcexres/tcm1603/acchtml/genlett.html
http://www.plainenglish.co.uk/
http://www.smplanet.com/webpage/webpage.html
http://www.textmatters.com/tm/guides/dbd.html

These addresses are current at the time of writing. However, it needs to be recognised that new sites are being launched on the Internet on a regular basis and that older sites may change or disappear.

Unit G041: How Organisations Use ICT

Guidance on Delivery

The work carried out by candidates needs to cover a range of different types of ICT activities and organisations. This work could be carried out through visits to local organisations. Case studies of a variety of different organisations could be created and used. Candidates may need to be taught strategies for interpreting case study material. At least **one** large organisation needs to be covered. It will be necessary for you to provide a wide range of example documents and information about the organisation for each case study.

These need to include terms such as:

- Definitions of the purpose and objectives of the organisation
- Documents that show how information flows, for example:
    - Letters
    - Memos
    - Orders
    - Invoices
- Charts that show the organisational structure
- Details of products manufactured, goods sold or services provided
- Details of the ICT facilities available in each job role
- Details of the departments and their role.

Typical organisations that could provide good potential study are:

- Large retailers, for example:
    - clothes shops
    - grocery shops
    - computer-product shops
- Manufacturers of goods, for example:
    - cars
    - electrical goods
    - steel products
- Providers of services, for example:
    - railways
    - bus companies
    - solicitors
    - councils
    - police
- schools, colleges and libraries.

To produce comprehensive diagrams of information flows, candidates need to identify different systems. Candidates need to identify

- between whom the information flows
- what the information is
- how the information is passed between people.

In order for candidates to see how ICT has impacted upon businesses and society, they need to learn about the technological developments that have taken place and the changes in working styles and employment opportunities that have resulted from these developments.

Resources

Organisations

Health and Safety Executive

Text books

Lawson J (ed)	*Vocational A-Level Information and Communication Technology*	Pearson Education Ltd	058 235 7098
Richards RP & Heathcote PM	*AVCE Units 1-3*	Payne-Gallway	190 311 229X

Websites

http://Europe.osha.eu.int/legislation/directives/
http://resources.ukonlineforbusiness.gov.uk/index.asp
http://www.fast.org.uk/
http://www.hmso.gov.uk/acts.htm#acts
http://www.hmso.gov.uk/acts/acts1988/Ukpga_19880048_en_1.htm
http://www.hmso.gov.uk/acts/acts1990/Ukpga_19900018_en_1.htm
http://www.hmso.gov.uk/acts/acts1998/19980029.htm
http://www.hmso.gov.uk/acts/acts2000/20000007.htm
http://www.hse.gov.uk/office/index.htm
http://www.hse.gov.uk/pubns/index.htm
http://www.informationcommisioner.gov.uk/

These addresses are current at the time of writing. However, it needs to be recognised that new sites are being launched on the Internet on a regular basis and that older sites may change or disappear.

Unit G042: ICT Solutions for Individuals and Society

Guidance on Delivery

Candidates need to be familiar with:

- using search engines efficiently to obtain information;
- using internal search engines and navigation tools to find information from large websites;
- using databases to find required information;
- using spreadsheet software to analyse numeric data and present results;
- combining different types of data to present the results of an investigation.

Candidates need to experience a variety of public service websites to be familiar with the type of information that they hold and the impact that the availability of such information has on individuals and society.

Candidates need to be confident with each of these skills before they are ready to undertake a major task.

The order of teaching different topics is unimportant. What does matter is that candidates see that the presentation of the investigation is as important a part of the process as the researching of the data.

Candidates need to choose appropriate techniques for finding information, such as database queries and effective use of search engines, and then use the relevant results of their searches to present their findings.

A variety of techniques for analysing and presenting data using spreadsheets need to be taught so that candidates are able to select and use the most appropriate for their purpose.

The importance this unit attaches to accuracy and suitability should ensure that candidates spend much time thinking about the quality of what they wish to communicate and then presenting it simply and clearly.

Resources

Textbooks

Heathcote RSU	*Further Excel*	Payne-Gallway 2000-2002	190 446 704 0
Kent P	*The Complete Idiot's Guide to the Internet*		
K Mary Reid (Ed)	*AS Level Applied ICT Single Award for OCR*	Heinemann	978 0 435449 97 1

Websites

http://uk.weather.com/
http://www.baa.com/
http://www.bbc.co.uk/
http://www.learnthenet.com/english/index.html
http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/FindInfo.html
http://www.nationalrail.co.uk/
http://www.nhsdirect.nhs.uk/
http://www.statistics.gov.uk/
http://www.direct.gov.uk/en/index.htm
http://www.visitbritain.com/

These addresses are current at the time of writing. However, it needs to be recognised that new sites are being launched on the Internet on a regular basis and that older sites may change or disappear.

Unit G043: System Specification and Configuration

Guidance on Delivery

The focus of this unit is to acquire a good understanding of the hardware and software that form computer systems and the extensive software configuration tasks that are necessary to meet given specifications.

It is important that you treat the software and hardware items listed as an *indication* rather than a *prescription*. It is difficult to keep pace with the advances in ICT and, as technology changes, some of the items listed may become more or less important and your course delivery needs to reflect this.

Candidates are expected to acquire sound knowledge of different hardware and software items. They also need to gain experience in configuring a variety of software.

Candidates need to make extensive use of screen prints (dumps) to show how they have set or modified software configurations. They need to gain experience of incorporating these, together with their own annotations, into logbooks or reports that describe their activities.

Software

Software problems need to include configuring the system by setting new values in the start-up ROM-BIOS and customising the appearance of a GUI system interface. There is a wide range of configuration activities that can be undertaken and candidates need to learn to undertake many of these simple configuration tasks. Sensible installation of software needs to include setting up suitable folder or directory structures.

Within applications software, candidates need to customise the software to meet a user need. Typical requirements are the layout of toolbars and buttons, the operation of multiple key depressions, the operation of macros, the use of standard templates to assist the user to achieve the formats they need, selecting the correct printer or printer driver, or ensuring the default path is suited to user needs.

Candidates need to match the characteristics of the different components to the requirements of the user. They might, for example, select a 21-inch ‘high-resolution’ monitor, a high-speed processor and a colour plotter for a user who will use the system to produce detailed manufacturing drawings.

Consideration of drivers for printers and other hardware might concentrate most on why such drivers are needed and how they may need to be configured rather than how they work.

This unit requires the provision of a computer that can be configured. Using a stand-alone computer will provide good opportunities for candidates to gain experience in installing and configuring software.

Resources

Organisations

Health and Safety Executive

Publications

Computer magazines such as *What PC* that include articles on hardware and software components.

Textbooks

K Mary Reid (Ed)	*AS Level Applied ICT Double Award for OCR*	Heinemann	978 0 435449 96 4
British Computer Society	*A Glossary of Computing Terms* Tenth Edition	Pearson Education Ltd	020 177 629 4
Gookin D & Rathbone A	*PCs for Dummies* Ninth Edition	John Wiley & Sons Inc	076 454 074 2
Lawson J (ed)	*Vocational A-Level Information and Communication Technology*	Pearson Education Ltd	058 235 709 8
Meyers M	*Michael Meyers' A+ Certification Lab Manual* Student Edition	Osborne McGraw-Hill	007 213 348 1
Rathbone A	*Windows XP for Dummies* Second Edition	John Wiley & Sons	076 454 074 2
Richards RP & Heathcote PM	*AVCE Units 4-6*	Payne-Gallway	190 311 248 6

Websites of particular use are:

http://www.hse.gov.uk/pubns/index.htm
http://www.pcindex.co.uk/

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Unit G044: Problem Solving Using ICT

Guidance on Delivery

This unit looks in more detail at the type of information and systems used within organisations.

Candidates need to be taught the importance of information and data within an organisation and how the use of information and data will affect the solution to a problem. This could be done through real-life examples looking at documentation and methods of communication within a number of large organisations. Candidates need to look at the flow of information up through the hierarchy of an organisation. They need to see how the information is used.

In this unit, candidates need to be made familiar with the different types of computer systems and software that can be used by organisations. Again, the use of real life examples needs to be used to make the theory more meaningful. Candidates need to know how the impact of changes within **one** section of an organisation can affect other departments.

An appreciation of the need for planning, decision-making and control when solving problems in organisations needs to be made. Candidates need to realise that solutions to problems don't just happen and that there is a lot of work involved to ensure that a solution can be implemented.

Resources

Textbooks

K Mary Reid (Ed)	*AS Level Applied ICT Double Award for OCR*	Heinemann	9780435449964
Dayton D	*Computer Solutions for Business*	Microsoft Publishing International	
Hollander A (ed)	*Accounting, IT & Business Solutions*	Irwin	
Ray R	*Technical Solutions for Growing Businesses*	Amacon	

Websites

http://www.bcs.org.uk – The home page for the British Computer Society
http://www.computer.org – The home page for the IEEE Computer Society

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Unit G045: Software Development – Design

Guidance on Delivery

This unit has links with Unit G054: *Software development*, but to ensure that each unit is meaningful in its own right there is a small overlap in content. The overlap is appropriate because the approach in each case is different. This unit introduces analysis methods that are used to investigate existing or potentially-new systems.

Candidates need to learn about the system's life-cycle and need to understand each stage and how it impacts on the next stage. They need to identify the tools and techniques that are used in the first **three** stages in particular. Each of these stages needs to be identified and the techniques and methods used at each point need to be covered. Candidates need to learn a variety of techniques so that they are able to select the appropriate ones to use for their coursework.

You need to cover analysis tools and methods such as:

- formal data-flow diagrams (DFDs) at two levels;
- informal diagrams such as ‘rich picture’;
- entity-relationship diagrams (ERDs);
- decision tables;
- flowcharts;
- structured English/pseudo-code.

Design of the system also needs to be covered. The importance of layout, both on screen and printed reports needs to be stressed as well as the ease of data input.

Resources

Textbooks

Avison DE & Shah H	*The Information Systems Development Life-Cycle: A first course in information systems*	McGraw-Hill 1997
Curtis G & Cobnam D	*Business Information Systems – Analysis, Design and Practice* (4th Edition)	Prentice Hall 2002
Deeks D & Lejk M	*Introduction to Systems Analysis Techniques*	Prentice Hall
Kendall JE & Kendall KE	*Systems Analysis and Design*	Irwin
Pressman RS	*Software Engineering: A practitioners approach (European adaptation)*	McGraw-Hill
Robertson J & Robertson S	*Complete Systems Analysis: The work book, the text book and the answers*	Dorset House
Shelly GB, Cashman TJ & Rosenblatt HJ	*Systems Analysis and Design*	Course Technolgy
Skidmore S	*Introducing Systems Analysis*	Macmillan
Sommerville I	*Software Engineering* (6th Edition)	Addison Wesley 2001
Whitten & Bentley	*Systems Analysis and Design Methods*	McGraw-Hill

Websites

http://www.bcs.org.uk – The home page for the British Computer Society
http://www.computer.org – The home page for the IEEE Computer Society

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Unit G046: Communicating using Computers

Guidance on Delivery

This unit allows candidates to investigate how communication and network systems are used by organisations. It covers identification of services provided by the Internet and intranets and how organisations make use of those services.

Candidates will be expected to research a website and analyse it to determine the technologies used, purpose and site map. Some pre-investigated sites would be useful to ensure that the site chosen has enough scope within it to allow candidates to achieve full marks.

As far as possible, the theoretical knowledge required needs to be gained from practical experience. This may be acquired by using different types of e-mail systems and investigating websites that use different technologies.

Candidates need practice in designing and specifying websites for specific purposes and in producing diagrams to indicate clearly their layout. They also need to be encouraged to learn, use and understand the technical terms associated with communications and networks.

Resources

Textbooks

Dean T	*Network+ Guide to Networks*		
Hunt C & Thompson RB	*Windows NT TCP/IP Network Administration*		
Lowe D	*Networking All-in-one Desk Reference for Dummies*		
Networking	*CCNA 1 and 2: Companion guide*	Academy Program Cisco	
Networking	*CCNA 3 and 4: Companion guide*	Academy Program Cisco	
Tanenbaum A	*Computer Networks (International edition)*		
Wegner JD & Rockell R	*IP Addressing and Subnetting Including Ipv6*		
K Mary Reid (Ed)	*AS Level Applied ICT Double Award for OCR*	Heinemann	978 0 435449 96 4

Websites

General:
http://www.cisco.com/ – Cisco Systems
http://www.windowsnetworking.com/ – World of Windows Networking

Manufacturers:
http://www.dlink.com
http://www.hp.com/
http://www.linksys.com/
http://www.netgear.com

News Sites:
http://wifinetnews.com/
http://www.comnews.com/
http://www.networkcomputing.com/

Notes:
http://www.scit.wlv.ac.uk/~cm1950/CP3397/ – various notes on networking
http://www2.rad.com/networks/netterms.htm – tutorials on networking

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Unit G047: Introduction to Programming

Guidance on Delivery

This unit is intended to give candidates an overall introduction to programming using a variety of programming languages, tools and techniques. Candidates need to, at the end of the unit, produce working programs, such as calculating the average of a given set of numbers stored in a file, performing a selection of tasks chosen from a menu or carrying out a selection of basic transactions. For each program they write, candidates should be given detailed program designs consisting of user interface design, process descriptions and program flowcharts. The given designs must allow candidates to produce programs covering the range of constructs, storage and manipulation of data and modularity.

Candidates should be given the opportunity to learn about a variety of languages and to learn at least two languages in sufficient depth to allow them to be able to recognise constructs, data manipulation and storage, and modularity. Additionally, one of these languages must be learned in sufficient depth to allow candidates to write their own programs.

It is recommended that candidates spend around **60** hours studying this unit, with more time devoted to language **one**, in which a program must be produced, than language **two**, which candidates need to understand but not necessarily use.

Resources

Text books

Reid KM(ed)	*AS Level GCE Applied ICT Double Award for OCR*	Heinemann
French CS	*Computer Science*	Continuum
Holmes A	*Learning to Use Visual Basic*	Heinemann
Holzschlag ME	*Using HTML 4*	QUE
Horton I	*Beginning Visual C++ 6*	WROX Press
Lhotka R & Hollis B	*Fast Track Visual Basic.NET*	WROX Press
Prinz P & Kinch-Prinz U	*A Complete Guide to Programming in C++*	Jones and Bartlett
Summers P	*Visual Basic 6.0 for Windows*	WROX Press
Wright P	*Beginning Visual Basic 6*	WROX Press

Websites

www.VBcode.com
www.wtvl.net/mike/webjr/begcpp.htm

These addresses are current at the time of writing. However, it needs to be recognised that new sites are being launched on the Internet on a regular basis and that older sites may change or disappear.

Unit G048: Working to a Brief

Guidance on Delivery

The emphasis for this unit is for candidates to produce a working response to an externally-set brief. This brief will be chosen from a varied list set by OCR at the start of each academic year and will allow candidates to explore and develop the issues surrounding the concept of *working to a brief*. The focus of this unit is on the processes that a person goes through when they work on a project. The project brief itself, whilst giving focus to a candidate, is not the end product that will be assessed. Candidates need to produce evidence of project planning, evaluation and development of ICT skills and skills required for working with other people. In this context, the 'others' could be either members of a team or could be the client of the set brief.

Candidates will need to plan their response to the brief. This plan should cover the period from the initial research into current working practice up to the completion of the solution to the brief. Whilst there is no need for the plan to cover the production of the final evaluative reports, candidates are required to gain feedback from the client and users. This research should be included, as it may give the candidate further opportunity to develop those skills necessary for the successful completion of the project. Candidates should be encouraged to use at least one formal planning technique (see list in 'Planning, Development and Delivery of a Project'). This plan should include an itemised list of tasks that need to be completed. The plan should also include a clear indication of how long each task is expected to take before it is completed, as well as the planned start and finish of the task.. The assessment for task b(ii) will be based on the extent to which the product, as planned by the candidate, may be completed as intended, were the plan to be passed to a competent third party.

As part of the response to the brief, candidates need to produce supporting documentation and so need to know about the range of support materials currently available, including on-line, paper-based, and other sources.

Candidates will need some guidance as to which brief to follow and need to know that the choice of briefs may be restricted by the nature of the educational establishment they attend or by the numbers available to follow the unit.

Candidates will be expected to produce an initial report into current working practice within the area covered by the brief. The focus of this current working practice report should be how the same or, in the absence of an exact fit example, a similar task is completed. An example would be for a brief requiring candidates to produce a website for a specific task. As an exact fit website is unlikely to exist, a review of websites that perform a similar function for a similar focus would be acceptable. The outcome of this current working practice report should be a description of the current working practice, highlighting and explaining strengths and weaknesses. This analysis will then allow the candidate to make informed decisions about the content, structure and production of their response to the brief.

Candidates need to have carried out some practical research into the role of individuals when working with others and may benefit from some case study work in preparation for the unit. The ability to reflect on the dynamics of real life teams and the role that individuals play within those teams would be a further advantage. Candidates also need to reflect on their own ability to work

with others and will need to develop the ability to criticise their own work as part of the preparation for the OCR set task.

A major part of the assessment of this unit will be based upon a diary or log that candidates will be expected to keep as they work through the project. This needs to provide evidence of how candidates deal with a range of issues throughout the life of the project and how their skills develop as they do so. The range of issues dealt with needs to include both structural issues and more practical issues surrounding day-to-day implementation of the project. The range of skills highlighted needs to cover those gained throughout the life of the project and should be limited to ICT skills gained.

Assessment of the unit will be carried out internally, with OCR carrying out moderation of your marking.

Resources

Textbooks

K Mary Reid (Ed)	*A2 Level GCE Applied ICT for OCR*	Heinemann	978 0 435462 14 7

Websites

http://whatis.techtarget.com/definition/0,,sid9_gci331391,00.html
http://whatis.techtarget.com/definition/0,,sid9_gci331397,00.html
http://www.ganttchart.com/
http://www.me.umn.edu/courses/me4054/assignments/gantt.html
http://www.mindtools.com/critpath.html
http://www.palgrave.com/skills4study/html/studyskills/workingwithothers.htm#team

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Unit G049: Numerical Modelling Using Spreadsheets

Guidance on Delivery

This unit is designed to be practical, with opportunities to link theoretical aspects of problem solving with exposure to more complex spreadsheet facilities. Spreadsheets are an excellent application for solving real problems of a wide degree of complexity, and have the flexibility to allow adjustments and enhancements to be made without seriously affecting the functionality of the solution.

The delivery strategy suggested below is based on the following important principles:

- the unit develops further ideas met in Unit G040: Using ICT to communicate;
- as the unit is about solving real problems, it is important to deliver the theory of the project life cycle and the involvement of the user at the various stages of this cycle;
- the unit is essentially about numerical modelling; it is essential that the problems met by candidates, as either exemplar material or for problem contexts, involve elements of numerical modelling; using a spreadsheet to simply store and present information, e.g. database solutions that involve little data processing are not suitable for this unit; this unit needs to be seen as the opportunity to focus wholly on numerical modelling;
- the specialist numerical modelling functions given in the 'What you need to learn' Section for this unit suggest some areas of problem solving that are suitable for this unit; these functions are not exclusive; centres are encouraged to specialise in different problem areas, as long as the area contains suitable numerical modelling problems of appropriate complexity for A2 level;
- candidates need to be taken through all aspects of a spreadsheet project, including being introduced to advanced and complex spreadsheet techniques and the sections of write-up that are required to provide the assessment evidence; this is best done in advance of candidates working on their own projects.

Resources

Organisations

Any small businesses or organisations that may use spreadsheets for numerical modelling. Examples may include small cafes, insurance agents, clubs and societies, play groups etc.

Textbooks

Beare R	*Mathematics in Action: Modelling the real world using mathematics*		
Heathcote PM	*Successful ICT Projects in Excel*		
Heathcote PM & Richards RP	*AVCE ICT Units 1-3*		
[both good for advanced use of spreadsheets, however do not provide focus on broader use of numerical modelling]			
Jackson M & Staunton M	*Advanced Modelling in Finance using Excel and VBA*		
McLaren D	*Spreadsheets and Numerical Analysis*		
Mott J & Rendell I	*Spreadsheet Projects in Excel for A Level* (2nd Edition 2003)	Hodder & Stoughton	034 081 202 8
Sjostrand D	*Mathematics with Excel*		
K Mary Reid (Ed)	*A2 Level GCE Applied ICT for OCR*	Heinemann	978 0 435462 14 7

Unit G050: Interactive Multimedia Products

Guidance on Delivery

This unit allows candidates the opportunity to develop skills in producing an interactive multimedia product. Candidates will be required to produce an interactive multimedia product to suit a given brief for one organisation. The interactive multimedia product needs to combine text, graphics and where appropriate, movement and sound, as well as further features of the specific form of product involved. The multimedia product should be capable of being distributed and run without the need for the software used to create it or any other software, such as a browser, to be installed on the system.

Particular care is needed in the choice of the commercial multimedia products candidates evaluate and the software used to create multimedia products to ensure that work carried out for this unit is distinct from the requirements of Unit G053: Developing and creating websites.

There will be opportunities for candidates to obtain briefs from real clients or during work experience. Equally, it would be valid to obtain real or simulated briefs from staff within the centre.

It is important that candidates have a good understanding of the effects of different elements of an interactive multimedia product and are able to combine those elements for their multimedia product. In order to create good quality products, candidates need to study the range of specific software available for the creation of interactive multimedia. There is a range of specialised software packages available for developing multimedia products and it is expected that most candidates will use one of these.

Candidates need to produce an interactive multimedia product to meet the needs of a given brief. The initial brief needs to be sufficiently demanding so as to allow them to show sufficient proficiency in their major product. Having been set a brief, candidates need to create a design for their product. Candidates also need to produce a user guide for the multimedia product.

Candidates need to keep a record of the skills that they acquire in order to complete their solution. Opportunity needs to be made available for candidates to use their own initiative to discover new skills and techniques required.

Once candidates have completed the brief, they need to evaluate their role in the process of producing the interactive multimedia product and the extent to which their products meet the client's requirements.

Resources

Websites

http://animation.about.com/?once=true&
http://graphicssoft.about.com/library/weekly/aa000104a.htm?terms=multimedia#mma
http://www.cs.cf.ac.uk/Dave/Multimedia/node26.html

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Textbooks

K Mary Reid (Ed)	*A2 Level GCE Applied ICT for OCR*	Heinemann	978 0 435462 14 7

Unit G051: Publishing

Guidance on Delivery

The emphasis of this unit is for candidates to produce a quality solution to a design brief, negotiated with a client, for a document that is to be published either on paper or as an e-book. Candidates will be required to produce a publishable version of their final document which needs to be submitted to the client, along with further instructions explaining the remaining elements of the publishing process. The publishable version will combine suitable text and images selected from a range, some of which will be produced in preparation by candidates. This will involve candidates in using both graphics and word processing software to a high level. The final publishable version will benefit from being produced using desktop-publishing software. The document should be of sufficient length (the equivalent of approximately 10 A4 pages) and complexity to allow a candidate to use a variety of information and editing techniques.

There will be opportunities for candidates to obtain briefs from real clients or during work experience. Equally, it would be valid to obtain real or simulated briefs from staff within the centre.

Candidates would benefit from access to a variety of graphic design, spreadsheet, database, word processing and DTP software. Candidates will further benefit from having access to microprocessor systems that have sufficiently fast processing, large RAM and sufficient storage space. In order to allow candidates the opportunity to cover the full range of tasks required for this unit, centres are advised, where possible, to make use of scanning equipment, digital cameras and video recorders. In order to fully evidence the quality and range of work produced during the unit, candidates will also need access to both black and white and colour printers.

Candidates need to involve the client throughout the drafting and production of the finished product and comments made by the client need to be reflected in the production of the finished product.

Resources

Publications

A full copy of proof-reading symbols required for use in this unit may be obtained by requesting BS 5261 Part 2 (1976) from:
British Standards Institution,
2 Park Street,
London
W1A 2BS.

Textbooks

A useful resource for gaining an in-depth knowledge of the publishing process:

Butcher J	*The Cambridge Handbook : Copy-editing for Editors, Authors and Publishers*	CUP	052 140 074 0

Unit G052: Artwork and Imaging

Guidance on Delivery

The emphasis of this unit is for candidates to produce a quality solution to an artwork brief. This will involve them in researching a need, examples of which include:

- graphics for a presentation (open day talk, candidate presentation);
- computer-aided drawings (circuit board design, kitchen planning, garden planning, architectural design, maps);
- computer-generated painting (design, advertising, Fine Art (expressive and observational)).

There may be opportunities for candidates to obtain such briefs from real clients or during work experience. Equally, it would be valid to obtain real or simulated briefs from staff and candidates within the centre.

The quantity of evidence required is intended to allow candidates to demonstrate a range of ICT techniques. It needs to be emphasised that they are not expected to produce work that includes all techniques in the final product; however, they need to include a comprehensive sample of material in their sample portfolio. Candidates need to study existing images to develop their understanding of those software techniques and hardware effects that they cannot experience directly.

Critical feedback and evaluation may be given by the client to the candidate and should then be reflected on by the candidate. Alternatively, candidates may demonstrate their ability to evaluate by criticism of existing images that formed part of their research. They may also demonstrate it by giving advice to peers.

You may envisage only a small group of candidates as having the requisite artistic talent needed to achieve a high grade in this unit. It may be possible to co-teach this unit with Unit G051: *Publishing*, allowing those candidates with greater talent to study this unit either instead of, or as well as, Unit G051.

Resources

Candidates would benefit from access to a variety of graphic design, word processing and DTP software. Candidates will further benefit from having access to microprocessor systems that have sufficiently fast processing, large RAM and sufficient storage space. In order to allow candidates the opportunity to cover the full range of tasks required for this unit, centres are advised, where possible, to make use of scanning equipment, digital cameras and video recorders. In order to fully evidence the quality and range of work produced during the unit, candidates also need access to both black and white and colour printers.

Publications

A full copy of proof-reading symbols required for use in this unit may be obtained by requesting BS 5261 Part 2 (1976) from:
British Standards Institution,
2 Park Street,
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Textbooks

A useful resource for gaining an in-depth knowledge of the publishing process:

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Unit G053: Developing and Creating Websites

Guidance on Delivery

Candidates need to evaluate existing websites to identify the good and not so good features of these sites. They also need to use the results of their evaluation to feed into the design for their own website.

There is now a range of software packages for developing web pages and special effects on websites for most of the web programming languages. It is expected that candidates will use **one** of these to produce their websites. Some of these packages also have facilities for planning and tracking the development of a website and candidates should be encouraged to use these.

It is important though that candidates have a basic understanding of the script or language used to create web pages since there may be features that they feel they need to include that are not available in the software package they are using. Candidates may use dynamic objects on a page which are evaluated and executed when the author saves the page or the website visitor browses to the page. Most of these components generate their own HTML script. Indeed, candidates may use any available web development tools. Some allow, as a feature, a drag-and-drop overall link view of every page on the database. Such tools may also have a built-in WYSIWYG editor and a technology that allows non-programmers to incorporate interactive features such as full-text search, threaded discussion groups, automatic end user registrations, etc.

To aid candidates to carry out the annotation of a web page in HTML script format, some teaching of the basic structure and layout of scripts will be needed, but candidates also need to use language reference books to complete this task.

Candidates need to know how to install their website and test it through a browser such as MS Internet Explorer, Firefox, Mosaic or Safari. Candidates should be encouraged to publish their website so that they gain a practical knowledge of the processes involved.

Resources

Textbooks

A useful resource for gaining an in-depth knowledge of the publishing process:

K Mary Reid (Ed)	*A2 Level GCE Applied ICT for OCR*	Heinemann	978 0 435462 14 7

Websites

http://www.bitlaw.com/internet/webpage.html
http://www.createafreewebsite.net/
http://www.edselect.com/web_page_design.htm
http://www.getawebsite.friezedesign.co.uk
http://www.ratz.com/featuresgood.html
http://www.rci.rutgers.edu/~au/workshop/create-t.htm
http://www.useit.com/alertbox/9605.html
http://www.users.nac.net/falken/annoying/main.html
http://www.w3schools.com/html/default.asp
http://www.weblens.org/fivesteps.html
http://www.webpagesthatsuck.com/
http://www.webstyleguide.com/index.html

These addresses are current at the time of writing. However, it needs to be recognised that new sites are being launched on the Internet on a regular basis and that older sites may change or disappear.

Unit G054: Software development

Guidance on Delivery

This unit links with Unit G044: *Problem solving using ICT* and Unit G045: *Designing computer solutions*, but to ensure that each unit is meaningful in its own right there is a small overlap in content. The overlap is appropriate because the approach in each case is different. In systems analysis, data modelling tools are used to investigate existing or potentially new systems, while in database design they are concerned with aspects of logical design, reliability and integrity.

The type of resources required are:

- examples of DFDs and process definitions;
- examples of structured data modelling;
- simulated systems with copies of input-output documents, organisation charts, etc.
- access to manual data processing systems suited to investigation for computerisation;
- access to computerised database systems that are not meeting their customers needs.

It is likely that a good deal of teaching will be required before candidates acquire the necessary skills in using the tools of systems analysis. Each of these tools requires knowledge and experience before they can be used on a realistic task. This teaching needs to be based on the use of a variety of case studies so candidates will have the opportunity to work on a range of problems to improve their skills in producing:

- high-level DFDs;
- low-level DFDs;
- process specifications using structured English, decisions and flow charts;
- entity-attribute definitions;
- entity-relationship diagrams;
- a normalised data model to first normal form (atomic and no repeating elements);
- a data dictionary;
- rich-picture;
- decision trees/tables.

Resources

Textbooks

Avison DE & Shah H 1997	*The Information Systems Development Life-Cycle: A first course in information systems*	McGraw-Hill	
Curtis G & Cobnam D 2002	*Business Information Systems – Analysis, Design and Practice* (4th Edition)	Prentice Hall	
Deeks D & Lejk M	*Introduction to Systems Analysis Techniques*	Prentice Hall	
Kendall JE & Kendall KE	*Systems Analysis and Design*	Irwin	
Pressman RS	*Software Engineering: A practitioners approach (European adaptation)*	McGraw-Hill	
Robertson J & Robertson S	*Complete Systems Analysis: The work book, the text book and the answers*	Dorset House	
Shelly GB, Cashman TJ & Rosenblatt HJ	*Systems Analysis and Design*	Course Technolgy	
Skidmore S	*Introducing Systems Analysis*	Macmillan	
Sommerville I 2001	*Software Engineering* (6th Edition)	Addison Wesley	
Whitten & Bentley	*Systems Analysis and Design Methods*	McGraw-Hill	
K Mary Reid (Ed)	*A2 Level GCE Applied ICT for OCR*	Heinemann	978 0 435462 14 7

Websites

http://www.bcs.org.uk – The home page for the British Computer Society
http://www.computer.org – The Home page for the IEEE Computer Society

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Unit G055: Networking Solutions

Guidance on Delivery

This unit allows candidates to investigate how communication and network systems work, the principles behind their design and the components required to construct them. It provides an opportunity for candidates who do not have access to the equipment required to set up and manage a network themselves to gain an understanding of how this is done.

As far as possible, the theoretical knowledge required needs to be gained from practical experience. This may be acquired by using different types of network. Where this is not possible, candidates need to be given the opportunity to observe different types of network. The network systems in the centre may be studied and compared with a system in a small office, for example.

Candidates need practice in designing and specifying simple computer networks for specific purposes and in producing diagrams to indicate clearly their layout and construction. They also need to be encouraged to learn, use and understand the technical terms associated with communications and networks.

Resources

Publications

Network Computing - http://www.nwc.com/
Network Magazine - http://www.networkmagazine.com/

Text books

Groth D	*Network+ Study Guide*		
Lammle T	*CCNA: Cisco Certified Network Associate Study Guide*		
Lowe D	*Networking All-in-one Desk Reference for Dummies (For Dummies S.)*		
Plumley S	*Home Networking Bible*		
K Mary Reid (Ed)	*A2 Level GCE Applied ICT for OCR*	Heinemann	978 0 435462 14 7

Websites

Cisco - www.cisco.com
Networking Site - http://compnetworking.about.com/
Networking Site - http://networking.ittoolbox.com/
RASD University -http://www2.rad.com/networks/netterms.htm

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Unit G056: Program Design, Production and Testing

Guidance on Delivery

This unit is intended to give candidates an opportunity to extend programming skills learnt from Unit G047: *Introduction to programming*. This unit builds on these skills and incorporates them into the whole design process. Candidates need to, at the end of the unit, analyse program requirements, write detailed specifications for straightforward programs, and develop program designs by considering all input, output, processing and data/file requirements. Candidates need to choose and use techniques for defining processes and structured methods for overall program design.

Resources

Textbooks

French CS	*Computer Science*	Continuum
Horton I	*Beginning Visual C++ 6*	WROX Press
Lhotka R & Hollis B	*Fast Track Visual Basic.NET*	WROX Press
Robertson L	*Simple Program Design*	Thomson Learning
Wright P	*Beginning Visual Basic 6*	WROX Press

Websites

www.freenetpages.co.uk
www.VBcode.com
www.wtvl.net/mike/webjr/begcpp.htm

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Unit G057: Database Design

Guidance on Delivery

This unit includes the concepts of normalisation to third normal form. It is essential to introduce candidates to normalisation at this level if they are to create a database that has **three** or more related tables.

You need to provide candidates with a variety of databases that contain **two** or more related tables, and demonstrate why the normalisation procedures are so important in producing a stable and reliable database. The tables provided could be incorrect and require normalisation, so that candidates acquire experience of normalising.

Before starting the assessment for the unit, candidates need to handle information in a wide variety of ways. It is very likely that the requirement in the 'Database Concepts' Section for this unit will be met by the examples provided by you. Candidates need to exercise their database skills extensively before they are ready to design, analyse and produce their own database application.

It is also important that candidates acquire some experience of live database systems. This experience is essential if they are to design and construct information databases to meet specified user requirements.

It is suggested that candidates could spend some time working together, both in pairs and as small groups, to:

- identify appropriate database applications;
- collect information about the processing problem;
- discuss what has to be done;
- analyse the data requirements;
- produce outline proposals for a database.

Having worked as a team to identify, analyse and design databases, it is essential that candidates work individually to design and construct their own database to produce the necessary assessment evidence. You need to ensure that the products used for assessment are the individual work of the candidate and not simply copies of other candidates' work.

Resources

Textbooks

Mott J & Rendell I	*Database Projects in Access for A Level (2nd Edition)*	Hodder & Stoughton 2003	034 081 201X
K.M Reid (Ed)	A2 level for OCR, Applied ICT	Heinemann 2006	978-0-435462-14-7

Websites

http://databases.about.com/cs/specificproducts/a/designmenu.htm
http://www.cit.cornell.edu/atc/materials/old/dbdesign/erd.shtml
http://www.geekgirls.com/menu_databases.htm
http://www.intelinfo.com/it_training_materials_and_books/free_database_design_training_materials.html

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Unit G058: Developing and Maintaining ICT Systems for Users

Guidance on Delivery

The unit builds on the knowledge and understanding gained in Unit G043: *System specification and configuration*, but to ensure that each unit is meaningful in its own right there is a small overlap in content. In order to deliver this unit, centres need to provide students with the hardware and software components which will enable them to set up a computer system which they can manage themselves. Centres may consider retaining older equipment for this purpose when systems are being upgraded. However, they need to ensure that the equipment allows candidates to carry out all the activities specified in the 'What you need to learn' Section for this unit.

In this unit, the emphasis is on specifying hardware components for a custom-built system. This will require candidates to acquire a far more detailed technical knowledge of components, how they operate and how they can be combined to create systems to meet the specific needs of users.

Specialist computer shops and consultants are able to design and custom-build computer systems from individual components to meet the specific needs of users. This unit has been designed to give candidates a detailed understanding of the characteristics and capabilities of a wide range of hardware components of microcomputer systems, to enable them to specify systems at this level.

The emphasis in this unit is for candidates to understand and interpret the technical specifications for different components and to select the most appropriate example of a particular type of component for a system. In doing so, they need to consider a range of issues, including compatibility with other components, cost and future-proofing (the ability to replace or upgrade), as well as the requirements of the user, including the hardware requirements of any software to be used.

Candidates need to understand that a user may not, initially, provide sufficiently detailed information about what they need from a system. Before they can specify a system, candidates need to clarify the user's needs, either by questioning the user, or by investigating the processes the system will be required to carry out, or both. They must then identify the key requirements of the user. In some cases, the user may have already purchased equipment which they want to incorporate into the new system. Candidates need to take this into account when selecting components to ensure compatibility.

Candidates need practice in interpreting and clarifying user requirements and selecting components to meet them. You need to prepare suitable scenarios to enable them to do so.

Examples might include:

- a market research company which employs home-workers to interview consumers, enter questionnaire responses into a computer, process these and send summaries back to Head Office;
- a small printing company which processes text and incorporates graphics to produce newsletters/magazines for local small businesses;
- a kitchen-design/installation company which employs 'consultants' to visit prospective customers' homes to measure up and produce a quotation, the plans being produced later at the main office to a level suitable for the installation team to follow;
- the treasurer of a charitable organisation who has special needs, e.g. a visual impairment, who wants to use ICT to keep track of the accounts of the organisation, and for general correspondence.

The resources required for this unit will include a wide range of suppliers' and manufacturers' catalogues, technical manuals, computer magazines and textbooks providing explanations of standards and operational characteristics of the components under investigation. Candidates would also benefit from being able to use a wide range of such components so that they can gain practical knowledge of their features and operating characteristics. A range of diagnostic software is available for running benchmark tests on the components of computer systems. This would also provide candidates with practical experience and enable them to compare the performance of components empirically.

Taking old systems apart and rebuilding them may also help candidates acquire practical experience of components. Building a system from scratch is another possible practical activity. Undertaking this type of activity gives candidates the opportunity to question the need for the various components of a motherboard and observe the practical mechanics of fitting system components together in a box (main processing unit).

The section on microprocessor architecture requires candidates to realise that there are different types of architecture and to look at how they are organised.

When studying display systems, candidates need to understand that this is more than just the VDU and includes factors that affect display performance such as screen memory, graphic adapters and video cards. Similarly, the features of secondary storage devices include both the media and the drives required to access them.

It is recognised that new and improved components are continuously being developed and it is expected that candidates will include in their investigations those that are available at the time.

Candidates need to be taught tools and strategies for troubleshooting computer systems. They need to identify the components that may be causing the problem.

Many of the previous statements listed in the 'Compatibility and other Factors' and 'Meeting a User's Needs' Sections for this unit will also apply when upgrading or replacing components in existing systems.

Resources

Websites

http://www.buildyourowncomputer.net/learntobuild.html
http://www.computer.howstuffworks.com

http://www.daileyint.com/build/
http://www.karbosguide.com/
http://www.learnthat.com/courses/computer/buildpc/
http://www.tomshardware.com/

These addresses are current at the time of writing. However, it needs to be recognised that new sites are being launched on the Internet on a regular basis and that older sites may change or disappear.

Unit G059: ICT Solutions for People with Individual Needs

Guidance on Delivery

It is recommended that support be sought from local organisations for people with disabilities, as many of these are likely to be keen to assist whilst raising awareness of their particular disability.

The order in which disabilities are covered is open to variation but experience has shown that many people envisage ‘disabilities’ as dependency on a wheelchair, so it may be advantageous to start with other disabilities that do not reinforce this stereotype. Candidates could start by contacting local groups in their area to see what the needs are and to research disabilities online to get some idea of what impairments mean in real life.

General discussion and ‘brain storming’ sessions to identify a wider range of disabilities and needs would be advantageous.

Case studies need to provide enough detail to enable candidates to accurately assess the needs of the person in their case study. If these are based on living people, care needs to be taken to mask the identity of the individual. If candidates wish to use details of individuals in place of case studies, they need to secure permission to use the information. The teacher will need to give some guidance on the sensitivity of doing this work and the need to include the person in some of the testing at the end. Candidates will need to make it clear from the beginning that they may not be able to solve the person's problems and that they are not manufacturing solutions or software. There may also be issues about the contacts candidates have with individuals and how they gain access to talk to them. There is no point arranging to see a deaf person who uses sign language, for example, unless the candidate takes a sign interpreter with them. In some cases it will be preferable to use case studies and obtain information through disability organisations rather than work with individuals who may not be able to tell the candidate what they need.

Candidates need to present their report in an appropriate way for the person outlined in the case study, as well as making sure that all required points are covered. In some circumstances, candidates may find it appropriate to make a sub-report for the person in the case study. Examples of such circumstances are an audio recording of the report for a blind person, or a shortened and simplified version for a child or an adult with limited understanding.

Resources

Organisations

RNIB
RNID
SCOPE

Websites

Ability.net
http://www.abilitynet.org.uk/

Ability online
http://www.abilityonline.org.uk/

Database of links
http://www.ability.org/index.html

Disability Discrimination Act 1995
http://www.hmso.gov.uk/acts/acts1995/Ukpga_19950050_en_1.htm

Disabled Living Foundation
http://www.dlf.org.uk/

Disability Rights Commission
http://www.drc-gb.org/

Disability Rights Commission Act 1999
http://www.legislation.hmso.gov.uk/acts/acts1999/19990017.htm

Equipment ideas
http://www.remap.org.uk/

Foundation for Assistive Technology
http://www.fastuk.org/

Legislation info
http://www.disability.gov.uk/

Limbless Association
http://www.limbless-association.org

National Autistic Society
http://www.nas.org.uk/

Our focus is people with cerebral palsy (cp)
http://www.scope.org.uk/

Royal National Institute for the Blind
http://www.rnib.org.uk/

Royal National Institute for the Deaf
http://www.rnid.org.uk/

Skill: National Bureau for Students With Disabilities
http://www.skill.org.uk/

Susie describes her life with cerebral palsy (cp)
http://www.susiecphome.com/

UK Legislation
http://www.hmso.gov.uk/acts/acts2001/20010010.htm

Website for Learning Disabilities
http://www.ldonline.org/

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