Foreword

General National Vocational Qualifications (GNVQs) have been designed to provide a broad education as a basis for further training, further and higher education or for moving into employment. This is achieved by ensuring that students develop the general skills, knowledge and understanding that underpin a range of occupations or professions. Intermediate GNVQs are part of the level 2 provision in the National Framework of Qualifications.

The specifications have been approved by ACCAC for use by centres in Wales and by CCEA for use by centres in Northern Ireland.

General information

Students in Wales or Northern Ireland should not be disadvantaged by terms, legislation or aspects of government organisation that are different from those in England.

Where the content of the units refers only to England, students in Wales and Northern Ireland should have their learning focused on content specific to their country.

Centres interested in offering GNVQs through the medium of Welsh or Irish should contact their regional office (details below) who will be pleased to offer advice.

Welsh Regional Office
Manager Edexcel Wales
42 Lambourne Crescent
Cardiff Business Park
Llanishen
Cardiff CS4 5GG

Tel: 02920 689 911
Fax: 02920 689 933
E-mail: cardiff@edexcel.org.uk

Edexcel in Ireland
Belfast Regional Office
Regional Manager
Forestview
Purdy's Lane
Newtonbreda
Belfast BT8 4ZX

Tel: 01232 642 086
Fax: 01232 647 715
E-mail: belfast@edexcel.org.uk

Qualification structure

The 6-unit Intermediate GNVQ consists of:

- three compulsory units
- three optional units.

Compulsory units

The compulsory units have a broad focus providing the student with a general understanding of the sector as a whole.

Optional units

The optional units introduce a more specialised vocational focus and the opportunity to broaden the skills and knowledge already gained from the compulsory units.

The optional units can improve the opportunities available to students to progress to further education, employment or training.

The Edexcel Intermediate GNVQ has a set of optional units that are unique to Edexcel.

Equivalence

The 6-unit Intermediate GNVQ is designed to be of a standard equivalent to four GCSEs, at grades A* to C.

Access

Edexcel's policy concerning access to their qualifications is that:

- qualifications must be available to anyone who is capable of reaching the required standard
- qualifications must be free from barriers that restrict access and progression
- equal opportunities exist for all students.

It is, however, the responsibility of centres to recruit with integrity and centres should:

- provide applicants with information and advice on the course and its associated assessment
- identify specific needs
- select on the basis of each applicant's previous qualifications and experience.

Students who would benefit most from the Intermediate GNVQs are likely to have one or more of the following:

- a Foundation level GNVQ
- a standard of literacy and numeracy equivalent to GCSE grades C to D
- some related work experience.

Accreditation of prior learning (evidence from past achievement)

In assessing students, centres should be mindful that students may present evidence from past experience/learning which is still current. The centre assessor should match the evidence with the specifications, and if all the requirements have been met then the student should be given the credit, and accreditation can take place.

Please refer to the Edexcel publication *Accreditation of Prior Learning (APL),* published June 1990, order code 80-092-01 and available from Edexcel publications (see page 9).

Unit structure

Each GNVQ unit is made up of a number of sections. Some are directed at the student, others at the teacher. The sections are:

About this unit

This provides an introduction to the content of the unit, its relationship to other units in the qualification and progression routes. It also states the form of assessment for the unit.

What you need to learn

This states what students need to know and be able to do to achieve the unit.

Assessment evidence

This is the evidence the student must produce to achieve the unit.

This section states the form and general content of students' evidence. This could be, for example, a report, an information pack, or the outcomes from an investigation.

Students must produce the evidence stated in the assessment evidence. It must fulfil the requirements as stated in the grade criteria. The criteria for merit and distinction focus on improving the quality of the evidence, not producing more evidence.

Essential information for teachers

This suggests delivery and assessment strategies for the unit, associated resources and guidance on integrating the Key Skills, including the Wider Key Skills.

The guidance also highlights where appropriate how cultural, moral, social and ethical issues could be addressed within unit delivery. Environmental, European and health and safety issues are also identified.

Assessment

Assessment is focused on the unit. For each unit there is only **one method of assessment**, either a portfolio of evidence or an external assessment.

Moderation

The standard of internally assessed portfolios will be checked through a moderation programme. This is explained in detail in the section *Moderation of portfolio units* (see page 6) and will take place after the centre's own internal moderation.

External assessment

External assessments will be set, marked and graded by Edexcel.

One third of the compulsory and optional units will normally be externally assessed except for the areas of IT, Media, Art & Design and Performing Arts where the requirement is 25%. The external tests will assess the essential skills, knowledge and understanding associated with that unit.

The time allocated to the external assessment will depend on the form the assessment takes, which may be one of the following:

- performance tasks
- practical activities
- structured tests
- case studies
- research activities and associated assignments
- set assignments.

Where the external assessment requires it, students will be allowed to use specialist resources. Any such requirement will be specified by Edexcel in advance. The total mark gained for the assessment will determine the student's grade for that unit.

There will normally be two opportunities each year for students to take the external assessments, in January and in June.

Re-sits

Re-sit regulations will be sent to centres before the start of the course.

Grading

Each unit contains its own set of grading criteria, contextualised to the unit content. Units are graded according to those criteria.

This means that a student will either achieve a fail (below pass), pass, merit or distinction grade for every unit.

Internal assessment

In order to achieve a **pass** for an **internally assessed** unit, a student's work must cover all of the requirements of the pass criteria to the quality described in the pass criteria for that unit. If the work does not meet the pass criteria, that work must be awarded a fail grade.

Some students' work will go beyond the qualities described in the pass criteria, and will demonstrate some or all of the qualities described in the **merit** and/or **distinction** criteria.

Assessors should use their professional judgement to decide which set of criteria (ie pass, merit or distinction) best describes the depth and quality of the student work.

Differentiation

A range of points is available within each grade to allow for differentiation and to reward students for work at the higher end of each grade. For Intermediate GNVQs, the ranges of points available for each grade are as follows:

Allocation of unit points

6-unit Intermediate GNVQs

	Below pass	Pass	Merit	Distinction
Unit	0 – 6	7 – 9	10 – 12	13 – 16

Allocation of unit points

Fail	0 =	did not submit any work
	1 =	did not achieve any of the pass-grade criteria
	2 =	achieves only one pass-grade criterion
	3 =	achieves less than half of the pass-grade criteria
	4 =	achieves half of the pass-grade criteria
	5 =	achieves more than half of the pass-grade criteria
	6 =	just below pass-grade
Pass	7 =	achieves pass-grade criteria
	8 =	comfortably achieves pass-grade criteria
	9 =	a good pass just below merit-grade
Merit	10 =	achieves merit-grade criteria
	11 =	comfortably achieves merit-grade criteria
	12 =	a good merit just below distinction-grade
Distinction	13 =	achieves distinction-grade criteria
	14 =	comfortably achieves distinction-grade criteria
	15 =	a good distinction-grade achievement
	16 =	an excellent distinction-grade achievement

Externally assessed units

For a student to achieve a **pass** in an **externally assessed** unit, the student's performance in the external assessment must reach the boundary designated by Edexcel for that specific assessment. **Merit** and **distinction** grades will have similar boundaries. The student's raw mark will be converted by Edexcel to a points score, which will be reported to the centre.

Allocation of qualification points

The number of points allocated to each unit is recorded and added up to give an overall points total. This total for the qualification is then compared to the ranges allocated to each overall qualification grade.

6-unit Intermediate GNVQs

	Below pass	Pass	Merit	Distinction
Qualification	0 – 41	42 – 59	60 – 77	78 – 96

Hence a student will be awarded both an **overall qualification grade** (based on aggregation points) and **individual unit grades** (based on the criteria associated with each unit and associated points).

Moderation of portfolio units

The main purpose of standards moderation within GNVQs is quality control, ie to check that centres are assessing accurately and consistently to agreed national standards. This will be done by examining a sample of students' portfolios of evidence, after they have been assessed and internally standardised by centre staff.

For the majority of centres, moderation will be carried out by moderators visiting the centres. The process may involve postal sampling, meetings of moderators and centre representatives, centre visits or a combination of these and is likely to happen at the end of the programme.

The focus of the process will be at programme level. Edexcel takes action to change grades where these are found to vary from the national standards. Full details of the moderation procedures will be available to centres, including the size and nature of the sample of students' and assessors' work to be moderated.

Moderation will apply to all types of students' work, including written outcomes, artefacts and performance evidence.

Awarding and reporting

The grading, awarding and certification processes of GNVQs comply with the requirements of the GNVQ Code of Practice for courses starting in September 2000.

Key Skills

Students can achieve the vocational qualification without gaining Key Skills. However the Key Skills should be delivered as an integral part of the qualification but should be separately recorded and certificated.

Centres should encourage students to gain the Key Skills qualification. This may be certificated at a level that is different from the level of the Intermediate GNVQ, eg Communication at level 1, Application of Number at level 2 and Information Technology at level 3. Students may prefer to have individual Key Skills accredited.

Within the units there is guidance to show centres how vocational and Key Skills achievement can be successfully combined. The guidance identifies 'keys to attainment' and 'signposting'.

Keys to attainment are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If the student has met the indicated vocational requirements of the unit, the keys to attainment show that the relevant aspect of the Key Skills will also have been achieved.

Signposting indicates naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence.

Aspects of Key Skills are indicated at the end of each unit, sometimes as 'key to attainment' (K) and sometimes as 'signposts' (S).

Wider Key Skills

Within the units there are also opportunities for the student to achieve Wider Key Skills. These are:

- Working With Others
- Improving Own Learning and Performance
- Problem Solving.

These have also been identified at the end of each unit.

Nesting

GNVQ Intermediate units have been designed so that they can be delivered together with associated GNVQ Foundation units. This concept is known as nesting.

Nesting offers many advantages to students and centres, for example:

- smaller groups can be taught together. However there will have to be additional sessions to allow Intermediate students to gain greater breadth and depth
- it helps with initial assessment of borderline students so that decisions concerning the specific level offered to the student can be delayed
- it allows a fast-track to Intermediate level. The majority of the nesting is within the compulsory units as the optional units are more specialised
- it aids progression for less confident students. They will be progressing to a programme where they are already familiar with some of the content.

Appeals

Every Edexcel centre must have an appeals procedure that is known to staff and students. Students have the opportunity to appeal against assessment decisions made either by the centre or by Edexcel relating to:

- work assessed by the centre
- work assessed by Edexcel.

Centres responsible for local assessment decisions are required to have appropriate appeals and counselling procedures in place. Edexcel is available to offer advice and act as an impartial observer or moderator when requested to do so by students and/or centres.

If, after thorough local procedures have been undertaken, a student still feels that an inappropriate decision has been reached, then the student may appeal directly to Edexcel. In such cases, Edexcel will contact the head of centre concerned to request a full report.

All appeals to Edexcel must be accompanied by supporting evidence, which must be relevant to the grounds on which the decision in question was made.

Appeals to Edexcel should be submitted to the Edexcel Compliance and Regulation Unit who will determine the appropriate procedure for the appeal. This will normally involve an Appeals Review Panel.

Special arrangements

Students with special requirements may require additional support, for example technical aids or specially devised or adapted methods of assessment, with additional time allowed if necessary.

Edexcel will comply with the regulations for assessment in GNVQs as described in the Joint Council of National Vocational Awarding Bodies document *Provision for Candidates with Particular Requirements (Special Assessment Needs) 1998/9* or the equivalent updated document. Centres are advised to obtain copies of the current document from Edexcel.

In accordance with the published guidelines, Edexcel is happy to assess whether special considerations or concessions can be made for candidates with particular requirements. Requests should be addressed to:

Special Requirements
Edexcel Foundation
Stewart House
32 Russell Square
London
WC1B 5DN

Centre/teacher support

There is a full range of support material designed for each GNVQ including:

- specimen tests
- exemplar grading materials
- sample materials for delivering the units
- sample materials for assessing the units.

Edexcel delivers a full INSET programme to underpin the GNVQs. This may take the form of subject-specific conferences, seminars, or tailor-made events for individual centres. Details of these are updated annually and sent to centres.

Edexcel has regional offices which offer support to centres with subject-specific advice, visits, and a curriculum planning service.

Further information concerning INSET and regional offices can be obtained from the Edexcel Customer Response Centre on 020 7393 4500.

Our publications can be obtained from:

Edexcel Publications
Adamsway
Mansfield
NG18 4LN

Tel: 01623 467 467
Fax: 01623 450 481
E-mail: publications@maillin.co.uk

Aims

The course will encourage students to:

- use ICT for the presentation and manipulation of information
- acquire knowledge and understanding of the prominent features of ICT as reflected by its use across many industry, commerce and service sectors
- acquire knowledge and understanding of the hardware and software used to provide ICT services
- acquire and apply the basic skills and techniques needed by those working in ICT services
- develop an appreciation of the role played by ICT in society as a whole.

Objectives

The qualification requires students to demonstrate their ability to:

- show knowledge and understanding of the specified content
- apply their knowledge and understanding in a variety of practical contexts
- select and use a variety of skills and techniques appropriate to work in the world of Information and Communication Technology.

National provision

Intermediate GNVQ in Information and Communication Technology provides a unique opportunity for students to follow the national curriculum programmes of study for Information and Communication Technology at KS4 in an applied way, having a greater emphasis on the application of skills, knowledge and understanding from the world of Information and Communication Technology. It also provides students with the opportunity to develop and transfer vocational skills.

At foundation level, students have the opportunity to present information in a range of the most popular commercial formats. They will perform basic creation, manipulation and retrieval of data from popular database and spreadsheet packages and perform basic hardware and software configuration. The optional units provide opportunities to utilise these basic skills in more specialised areas of information technology.

A pass level Intermediate GNVQ in is Information and Communication Technology equivalent to four GCSEs (A-C*).

Recommended prior learning/Attainment and experience

All Edexcel vocational qualifications are built on the foundation principle of equality of opportunity and the ability to achieve. Organisations offering Edexcel vocational qualifications are required to recruit with integrity. Centres are expected to select students on the basis of their ability to contribute successfully complete qualifications.

Students who would benefit most from an Intermediate GNVQ in Information and Communication Technology are likely to have one or more of the following:

- a foundation GNVQ in Information and Communication Technology
- a standard of literacy and numeracy supported by general education equivalent to GCSE at grades C-D
- some related work experience
- an interest in the application of ICT.

Structure and content of Intermediate GNVQ in Information and Communication Technology

For the award of an Intermediate GNVQ in Information and Communication Technology, a student must complete **six** units:

- three compulsory units
- three optional units.

From the compulsory units, **Unit 1: Presenting information (Intermediate)** is the externally assessed unit.

From the optional units, **Unit 5: Information resources (Intermediate)** is the externally assessed unit and must be chosen.

This unit supports all pathways. It is therefore the only externally assessed optional unit.

The remaining four units are assessed through portfolio evidence.

Compulsory unit numbers and titles

Unit number	Unit title
Unit 1	Presenting information
Unit 2	Handling information
Unit 3	Hardware & software

Optional unit numbers and titles

Unit number	Unit title
Unit 4	Design project
Unit 5	Information resources
Unit 6	Graphics
Unit 7	Multimedia
Unit 8	Networks & communication
Unit 9	Modelling numerical information
Unit 10	Database techniques & applications
Unit 11	Programming
Unit 12	Computer aided design

Progression for candidates

Successful completion of the Edexcel Intermediate GNVQ in Information and Communication Technology facilitates progression for candidates in the following manner:

- units that offer a vocational focus
- units that ease progression into employment in the Information and Communication Technology industry
- choice of units that also ease progression into the Advanced GNVQ in Information and Communication Technology or other Advanced GNVQs in related areas
- assessment strategies common with the Advanced GNVQ in Information and Communication Technology and with other GNVQs in related areas that ease progression from one level to another
- an opportunity to achieve Key Skills that enable successful candidates to be better prepared to match their skills to further education, training and employment
- links with units in the Advanced GNVQ in Information and Communication Technology that ease progression from one level to another.

Links with other qualifications

The broad nature of the Information and Communication Technology means that there are natural links with several other qualifications. There is no restriction on multiple entry with GCSE courses that are complementary and address common content in a different context. BTEC National Certificate and Diplomas offer the opportunity to develop the particular areas of the Intermediate GNVQ course to greater depth, while NVQ'S offer the opportunity for further qualifications for students who have moved on into employment. In both cases, the intermediate GNVQ course acts as an acceptable introduction to some of the ideas that will be covered.

GCSE

GCSE Information and Communication Technology has a general overlap through the study of:

- file creation and interrogation
- word processing
- creation and manipulation of spreadsheets
- desktop publishing.

BTEC National Diploma in Business ICT

Intermediate GNVQ ICT Unit 1: Presenting information and Unit 2: Handling information have some overlap with Unit 1 Language and communication. Students in all these units have to produce document that take into account the needs of the audience or end user. Intermediate GNVQ ICT, Optional Unit 5: Using information resources also requires the student to research and evaluate (draw conclusions in Using information resources) information.

Intermediate GNVQ ICT, Optional Unit 9: Modelling numerical information, has some overlap with Unit 2: Computational methods. Students have to use spreadsheets to model data and use graphical representation of data.

Intermediate GNVQ ICT Unit 3: Hardware & software has some overlap with Unit 3: Computer systems. Overlap only occurs where students have to understand system hardware and write simple programs though the BTEC National will require students to write code at machine and assembly level while the GNVQ unit requires students to write code in HTML and Macro languages.

Intermediate GNVQ ICT Optional Unit 11: Programming has some overlap with Unit 4: Introduction to software development. Students have to be able to design and test a computer programme.

Intermediate GNVQ ICT, Unit 2: Handling information has some overlap with Unit 5: Business information systems. Students have to understand and demonstrate the importance of information within organisations.

Intermediate GNVQ ICT, Optional Unit 8: Networks & communication has some overlap with Unit 6: Communication technology. Students need to demonstrate that they understand Communication software and hardware.

Intermediate GNVQ ICT, Optional Unit 4: Design project, has some overlap with Essential Optional Unit 7: Project. Students have to identify a problem and design a software solution for that problem. They also need to test and evaluate their project.

Intermediate GNVQ ICT, Optional Unit: Design project, and Optional Unit 11: Programming have some overlap with Unit 10: Application software development. The programming overlap only applies where students are creating computer programmes written in a procedural language. But all students will be required to identify, solve and evaluate a software solution to a problem.

Intermediate GNVQ ICT, Unit 3: Hardware & software, has some overlap with Unit 15: Software applications. The overlap occurs where students are looking at application software.

Intermediate GNVQ ICT, Optional Unit 10: Database techniques & applications has some overlap with Unit 16: Data analysis and design. The overlap occurs where students are required to create a relational database. The BTEC unit concentrates on SQL, which is not mentioned specifically in the GNVQ unit.

Intermediate GNVQ ICT, Unit 3: Hardware & software has some overlap with Unit 17: System specification and justification. The overlap occurs where students have to identify hardware and software solutions for an end-user.

Intermediate GNVQ ICT, Unit 3: Hardware & software has some overlap with Unit 18: Computer hardware.

NVQs

This qualification provides broad knowledge, skills and understanding for a number of units in Level 2 NVQ IT, Using IT.

Unit 1: Presenting information, has some overlap with Level 2 NVQ IT: Using IT, Units 202 and 203: Produce documents using word processing software. All units require students to produce documents using ICT equipment.

Unit 2: Handling information has some overlap with Level 2 NVQ IT: Using IT, Unit 203: Produce spreadsheet documents and Unit 212: Maintain and use databases. Students are required to create spreadsheet and database documents.

Unit 5: Information resources, has some overlap with Level 2 NVQ IT: Using IT, Unit 205: Communicate information electronically. The overlap only occurs when students are required to use communication technology.

Unit 6: Graphics, has some overlap with Level 2 NVQ IT: Using IT, Unit 207: Produce documents using graphical images. Both units require students to produce documents containing graphical images.

Unit 9: Modelling numerical information, has some overlap with Level 2 NVQ IT: Using IT, Unit 203: Produce spreadsheet documents.

Unit 10: Database techniques & applications has some overlap with Level 2 NVQ IT: Using IT, Unit 212: Maintain and use databases.

NVQ IT Operating IT Systems at L2 links to Intermediate GNVQ ICT

Unit 3: Hardware & software has some overlap with Level 2 NVQ IT: Operating IT systems, Optional Units 213 and 214. In these units student have to configure a computer system.

NVQ IT Installing and Supporting IT Systems at L2 links to Intermediate GNVQ ICT

Unit 3: Hardware & software has some overlap with Level 2 NVQ IT, Installing and supporting IT Systems, Units 213, 214 and 217. In these units student have to install and test software and hardware.

Nesting

Several of the units for the GNVQ in Information and Communication Technology at Foundation and Intermediate levels have been written so they have common focus for their content. With appropriate planning they could be co-taught. However assessment requirements are slightly different, and students transferring from one level to another would need to provide different assessment evidence.

Foundation unit	Intermediate unit	Common focus
Unit 1: Presenting information	Unit 1: Presenting information	writing styles and document layout presentation techniques standard ways of working.
Unit 2: Handling information	Unit 2: Handling information	information finding information classifying data and information information processing database design spreadsheet design standard ways of working.
Unit 3: Hardware & software	Unit 3: Hardware & software	ICT systems setting up ICT systems producing macro programs (automated routines) creating templates standard ways of working.

Foundation unit	intermediate unit	Common focus
Unit 4: Design project	Unit 4: Design project	identifying a suitable project describing the design planning the work carrying out the work checking that it works reviewing your work standard ways of working.
Unit 5: Using information resources	Unit 5: Information resources	investigating a subject paper-based sources ICT-based information finding ICT-based information other sources of information information in organisations collecting information on a subject standard ways of working.
Unit 6: Graphics	Unit 6: Graphics	types of image graphic software tools and facilities producing drawings (vector-based images) producing photo and paint images (bitmap graphics) scanned images clip art standard ways of working.
Unit 7: Multimedia	Unit 7: Multimedia	presentation techniques accuracy and suitability software multimedia skills planning techniques standard ways of working.

Relationship with National Occupational Standards

The Intermediate GNVQ in Information and Communication Technology falls within the National Qualification Framework. In order to meet the NQF requirements, all vocational qualifications must also meet National Occupational Standards for that industry. These standards have been laid down by the Information Technology National Training Organisation (ITNTO) and the National Information Systems Skills Framework (NISSF). NISSF provides a simple, logical two-dimensional framework on which areas of work and levels of responsibility are shown and illustrating how ICT roles share a common set of skills.

Links with industry

As a vocational qualification, care has been taken to ensure that unit outcomes match current job roles and responsibilities at a similar level. However, the ICT industry is subject to fast change so it is important that GNVQ students are kept informed of those changes. Visits to industry should be encouraged. Employer Liaison Links and similar links are appropriate ways to involve industry into the GNVQ programme. Speakers from the ICT industry should be invited to talk to students at regular intervals.

Other issues

The Intermediate GNVQ in Information and Communication Technology takes into consideration and is influenced by ethical, moral, social, cultural, environmental and European issues when handling information, designing and using software and the Internet.

Issues of spiritual, moral, ethical, social and cultural awareness are reflected within the following units:

- Unit 2: Handling information
- Unit 4: Design project
- Unit 5: Information resources
- Unit 8: Networks & communication.

Environmental issues, health and safety considerations and European developments consistent with relevant international agreements are reflected within the following units:

- Unit 2: Handling information
- Unit 5: Information resources
- Unit 8: Networks & communication.

Glossary

These are the working definitions of key terms used in the mandatory units of the Foundation, Intermediate and Advanced GNVQs in Information and Communication Technology.

Information and Communication Technology GNVQ tutors/teachers and students may also wish to use the British Computer Society Glossary as a more comprehensive reference.

Applications

Software used for a specific purpose, eg textual document processing software(word processing), text and graphic printed presentation (desktop publishing), numerical analysis processing (spreadsheets), record and transaction processing (databases), computer-aided design and graphic drawing (vector graphics), graphics/artwork processing (bitmap graphics), slide/picture presentation (bitmap graphics), accounts processing. Some software integrates several of the above uses in one package.

Attribute

In relation to database entities, an attribute is a single data item representing an individual property of the object (entity).

Batch processing

This type of processing involves collecting jobs or material to be processed over a period of time, and creating a schedule followed by one complete processing session. The user has very little interaction with the process.

Bitmap graphics

A graphic image or text formed by a pattern of dots or pixels. Examples include scanned documents and printed newspaper pictures. An electronic graphic file where each minute item (dot) in the graphic picture is represented by a single (or several for colour) bit of information in the file. Thus a picture with 8,000 bits of information would produce a 1,000-byte file. (1 byte = 8 bits). These files cannot be scaled in the way that vector-based images can.

Communication software

Software is required for all types of computer-based communication. The main types of software are: system, user interface, and communication, eg Terminal in Windows.

Control procedure

The program created to operate a process control system. The procedure is designed to read input data, process the data and send output signals according to preset rules, eg read light level, compare with limit set, adjust output if necessary.

Control system

A computer system which automatically controls a process or mechanical device by sensing the need to vary the output. Examples of sensors are light, heat, humidity and Ph. A control system is said to have feedback when it is the output of the controlled device which is sensed and fed back to the computer.

Database

A collection of data held in an organised way. Most manual databases or paper-based databases contain files of indexed information. Electronic databases usually contain data items (eg files) and their relationships (indexes and keys).

Database report

The production of output from software such as a database for a specific purpose such as a telephone list, a list of orders, an invoice or a statement of account.

Data storage

Ways of storing data and information. Non-electronic ways could be: filing cabinet, account book, card file or cupboard; electronic ways could be data files on tape or disc.

Defaults

The settings of 'software configuration' or 'hardware configuration' to a standard set of values for the user.

Feedback

The process where part of an output is fed back into the input to enable action to be taken to increase or reduce the output. Positive feedback results in increased output whereas negative feedback results in reduced output.

Field

Part of a record structure for storing a particular data item (attribute). The area allocated on a screen or form design for a particular data item.

Field length

The number of characters in a field.

Field type

Classification of the type of data in a field (part of a record).

File protection

A facility offered on most LANs to enable users to set rights to their files and subdirectories for other users, eg read, copy and write. These rights may also be set in most systems by adjusting the attributes of the file itself, ie read only, hidden. See 'Local area network'.

File server

The computer which contains the network software for a LAN and often the applications software accessible to the stations using the network. See 'Local area network'.

Gaming (modelling)

Using software to model a situation for the purpose of a game, eg modelling a forest where treasure must be found.

Graphic user interface

An operating system, or an addition to the operating system, which provides a graphical form of communication with the user, who inputs textual commands by pointing and picking instead of using the keyboard.

Hypothesis testing (modelling)

Using computer models such as spreadsheets to test possible situations, eg modelling financial breakeven points for a business like an airline or hotel using 'what if' queries such as changing fuel consumption etc.

Importing

Transferring data from a file into existing data or documents. Care must be taken to ensure that the imported file does not destroy the style of the document into which it is transferred.

Index file (database)

A file within a database which enables rapid reference to the records in a preset order. The index file only contains the order of the records in the file for the keys used in the index. Related files often have to be indexed on the foreign key in order that one to many relationships can be used.

Input devices

Include: keyboard, mouse, digitiser, joystick, bar code reader, MICR, OMR, OCR, voice (speech recognition), scanner, sensor devices, data logger.

Key

One of the attributes of an entity on which an index has been created or a relation has been set. Primary keys are the key attributes in a table, secondary keys are used to sort records with the same primary attribute value, foreign keys are the attributes in a table which provide the facility for relationships to be set with primary keys in the parent table.

Local area network (LAN)

The cable interconnection of items of computing equipment over a small local area such as a single building or site. Such systems enable the sharing of data, software and equipment resources.

Logical operator

The Boolean operations such as AND, OR etc. Macro A program written using applications software tools to automate a sequence of keystrokes or events. Simplified ways of creating such programs are often provided.

Magnetic strip

The most extensively used form of automated data collection. This reader can vary between the small strip on goods labels which are used to automate tills and provide an alternative to bar codes, to the bank and credit cards used extensively in cash machines for electronic funds transfer.

Mail merging

Combining a master file with a secondary file containing variable data such as names and addresses, to produce multiple documents – each of which contains the same master information but is addressed to a different addressee.

Main processor

Includes: CPU, motherboard, controller boards, (eg video, disc), unit special processors (eg maths), input and output ports, serial, parallel etc.

Micro-computer

A system of hardware and software comprising: main processor unit, keyboard, VDU, auxiliary storage and possibly other peripheral units together with an operating system.

Modes of communication

See ‘Transmission modes’.

Model (computer)

A software representation of a real situation or system which can be used for analysis of its operation. A simplified version of a process. Examples of models include: financial budgets with variable costs and profits, journey planning between geographical points using roads available, queues at checkout desks and the number of people waiting, traffic lights controlled by numbers of vehicles and pedestrians, producing a three-dimensional model of a building to investigate environmental effects on nearby surroundings, pilot simulation etc.

Modelling

Analysing a situation and converting it into a computer model to analyse its operation. See ‘Model (computer)’.

Multiple table input forms

Input forms which enable data (attributes) to be entered into more than one table (entity) at the same time.

Multiplexer

A devise which enables a number of low bit-rate devices to share a high bit-rate transmission line. The device enables the combination (and separation) of multiple signals which are transmitted over one cable.

Network

See 'Local area network' and 'Wide area network'.

Null modem

A cable used to enable two computers to communicate with each other by emulating a modem. The null modem cable is wired up so that the end connections from one to the other are: 2 connected to 3; 4 and 5 connected to 8; 6 connected to 20.

Operating system

The software program which provides the environment in which applications programs can be used. The operating system controls the operations of handling: input, output, interrupts, storage and file management.

Output devices

Include: visual display unit, printer, plotter, controlled devices, speech, and audio.

Permanent storage

Storing data such as computers BIOS and other Boot programs which are usually stored on ROM. See 'Storage devices'.

Pixel

Picture elements, the smallest element which can be displayed on a video display screen.

Prediction (modelling)

Using computer models to forecast an occurrence, eg the weather or what is likely if a pilot makes an error.

Primary key

The attribute or attributes used as the primary and unique index key for an entity.

Primary storage

Storing data and instructions in a computer's ROM and RAM. See 'Storage devices'.

Printer

An output device producing characters or graphic symbols. Common types are impact dot matrix, ink jet and laser. Resolution varies from 100 dots per inch to 1200 dpi and speed from 100 characters per minute to tens of pages per minute.

Printer server

The computer which contains the printer server software for a LAN and controls the printer queue. See 'Local area network'.

Private wide area network

A network which uses privately-leased or owned lines and does not offer the general public connection facilities, although it may provide network services to subscribers. Many of the well-known network service providers offer these facilities and enable access through gateways from other networks, eg Internet, JANET, CompuServe.

Process control

The automated control of a processing plant such as a petrochemical works, where input flow and control is regulated by various output sensor measurements.

Program

A complete set of program statements (instructions to the computer) structured to meet a given set of processing needs.

Programming language

Software which enables the production of computer programs. Each program is produced as code which must be translated into machine code for execution. There are a wide variety of such languages but the basic types are procedural, declarative and object-event.

Proofreading

Visually checking content to ensure that it is correct, meaningful and is in the correct layout and style. Errors can be marked to British Standard 5261 'Marks for copy preparation and proof correction'.

Public wide area network

A network which is generally intended to be accessible to the general public, eg telephone and cable TV networks which are wired up to many homes and may be used in a variety of ways.

Quality control (control)

Using process control systems to measure the quality of products, eg measuring the diameter of bolts or checking table tennis balls for size. Random Access Memory. Electronic, read and write memory which is volatile. It loses its contents when power is removed. See 'Storage devices'.

Record

A collection of related data items (attributes) treated as a unit. One occurrence of an entity.

Relational database

A database in which data is held in a number of related files, the date structures of which obey normalisation rules.

Relationship (database)

The way in which entities in a database system are related to form a complete rational database. The relationships may be one to one, one to many or many to many. Read Only Memory. Electronic, read only, memory which is not volatile. It does not lose its contents when power is removed. See 'Storage devices'.

Searching

Searching through data to locate a given value or string of characters. Examples could be 'own' to find the word own or 'own' to find the names Brown and Crown.

Secondary key

Using read/write data storage devices which are not part of the micro-processor. These usually use non-volatile magnetic media and are disc-or tape-based, eg hard and floppy discs and cassette tapes.

Security

Security of ICT systems relates to: data loss, data corruption, loss of confidentiality, contravention of copyright, equipment theft, software theft, data theft. It also refers to the methods used to control access to networks, directories, data files and software, as well as provision of backup, virus protection, audit trails, theft and copyright protection systems.

Selecting

Involves searching for and extracting data which matches the search. See 'Searching'.

Sensor

A device which outputs electrical signals when changes occur in their environment. Examples of sensors are heat, light, Ph, air/gas, sound and movement.

Simulation (computing)

A software representation of a real situation or system which can be used for analysis or training, eg pilot training or the reproduction of a process for testing purposes.

Software

The programs which enable computers to operate; instructions to a computer. Software can generally be classified according to the following different types: operating systems, applications, utilities (editors, diagnostics, file management), user interface, program generators, system services (database management, translators), videotex systems, coding and programming languages, system analysis (CASE), local and wide area networking, training and learning (CBL), testing and assessment, games and leisure applications.

Software facilities

Facilities within software packages which enable users to perform facilities tasks more effectively and efficiently. Examples include macros, mail merge, pagination and page headers or footers.

Sorting

Ordering data in numerical or alphabetical order. Sometimes sorting is undertaken on two fields so that where one field recurs that data is in order of a second field. Examples of this are the telephone directory where Smith is the primary field but a secondary field of 'initial' or 'second name' is used.

Special fields

Form fields designed to contain special data such as date, time, page number or calculations like column totals.

Stand-alone computer

A computer system which is complete in itself and requires no other devices to operate satisfactorily. Used to describe micro-computers which are not connected to networks or other communicating devices.

Storage devices

Include: RAM, ROM (CD, electronic), magnetic disc, CD disc, magnetic tape, magnetic card/strip.

Table

Entity types in a relational model are represented by a table of values where the columns represent attributes of the entity and each row of the table corresponds to an entity occupance. The header and body parts of the table form a relation containing attribute values (cells), attribute domains (columns-fields), records (rows) and keys.

Template

An electronic file which holds a standardised document layout or screen format, eg letter type, position of references and location of addressee details. The template can also hold style data, variable data or macros. Templates also refer to overlays for keyboard keys to indicate their action when used with a particular application.

Temporary

Storage which allows deletion of data or files. Magnetic tape and disc storage are the most common but laser discs and writable CD-discs are also available.

Transaction processing

The type of 'real time' data processing system which handles one transaction at a time. The system ensures that other users are locked out of the records being used, so that when a transaction is completed it is secure.

Transmission modes

There are several configuration settings which affect the mode of transmission.

Flow control and cable provisions affect the type of exchanges between stations. Simplex is a one-way mode of transmission; duplex is two-way; half duplex enables two-way transmission but not for each station simultaneously; asymmetric duplex is a two-way but with different speeds each way. Asynchronous transmission sends a character at a time with markers either end; synchronous systems are used to speed up this process and send whole blocks of data at a time by timing the start and end of the block. Cable types and facilities affect the type of transmission. Serial transmission sends each data bit down the same cable in sequence; parallel transmission enables the eight data bits to travel along separate cables simultaneously.

Transmission rate

Expressed in bits per second (bps), this rate depends on the transmission media, eg cable. Baud is the signalling rate and is sometimes the same as the bps, but the bps can be three or four times the baud rate.

User

An Information and Communication Technology professional, technician or operator, including members of the general public when they are accessing information through Information and Communication Technology systems.

Utilities

Software which performs common tasks such as file management, (software) editor facilities and diagnostic routines.

Validation

Checking a data entry to confirm that it is within the acceptable range and that it is not incomplete or unreasonable.

Vector graphic

A graphic image where the graphic elements are defined using co-ordinate geometry, enabling them to be scaled each time they are used without loss of resolution. Each of the entities (eg lines, circle etc) in a vector graphic can be manipulated individually.

Verification

Checking the accuracy of a data entry. Usually carried out by forcing an operator to read back and check the entry or by double entry of the data to check accuracy.

Volatile

Subject to change. Used to refer to electronic memory which loses its contents when its power source is removed.

What if

See 'Hypothesis testing'.

Wide area network (WAN)

The interconnection of items of computing and telecommunication equipment over a very large geographical area, eg countrywide or internationally. Such systems enable the sharing and transmission of data and information between LANs and individual users of the system.

Workstation

Generally a stand-alone computer but could be a dumb terminal.

KEY SKILLS MAPPING

Key Skill	Communication				Information Technology			Application of Number						Improving Own Learning and Performance			Working with Others			Problem Solving		
Compulsory																						
Criteria ref.	**2.1a**	**2.1b**	**2.2**	**2.3**	**2.1**	**2.2**	**2.3**	**2.1**	**2.2a**	**2.2b**	**2.2c**	**2.2d**	**2.3**	**2.1**	**2.2**	**2.3**	**2.1**	**2.2**	**2.3**	**2.1**	**2.2**	**2.3**
Unit																						
1				K									S	S	S	S				S	K	S
2	S	S	S	S				K	S	S	S	S	S	S	S	S				S	K	S
3	S	S	S	K									S				K	S	S	K	S	K
Optional																						
Criteria Ref.	**2.1a**	**2.ab**	**2.2**	**2.3**	**2.1**	**2.2**	**2.3**	**2.1**	**2.2a**	**2.2b**	**2.2c**	**2.2d**	**2.3**	**2.1**	**2.2**	**2.3**	**2.1**	**2.2**	**2.3**	**2.1**	**2.2**	**2.3**
Unit																						
4	S		S	K				S						S	K	S				K	K	K
5			K	K										S	S	S						
6				S					S	S	S	S		S	S	S				S	S	S
7			S	K										S	S	S	K	K	K	K	K	K
8			S	S													S	S	S			
9	S	S						S	S	S	S	S	S	S	S	S	S	S	S			
10				S					S	S	S	S	S							S	S	S
11			S	S																S	S	S
12	S							S	S	S	S	S	S	S	S	S						

Key: S = Signposting
K = Keys to attainment

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