
7 Unit 7: Communicating using Computers

[AS level, double award, optional, internally assessed]

7.1 ABOUT THIS UNIT

This AS level unit is an optional part of the double award only and is internally assessed.

The use of the Internet and intranets has expanded rapidly over the last few years. Recently, there has been an increase in the need for people with the skills for setting up and managing websites. This unit will help you to develop these valuable skills.

This unit will help you to:

- develop an understanding of how Internets and intranets are used by organisations;
- know how the Internet is organised and about standards and protocols;
- explain the different bandwidths that exist and different connection methods and equipment required;
- understand the different services that can be provided by the Internet and intranets;
- understand the software and hardware requirements for a web server that can support a website;
- know about a range of Internet tools and understand the purpose of the tools and select the appropriate tool for a specific task;
- know and understand the different costs involved in connecting to and accessing the Internet;
- understand the technical terms relating to the Internet and communication services and know about data compression and communication logs;
- set up and configure an e-mail system for a single computer;
- understand the principles of working safely and record keeping of faults found and repaired.

This unit has links with Unit 16: *Networking solutions*.

This unit is assessed through your portfolio work. The mark on that assessment will be your mark for the unit. You will produce:

- a report on an organisation detailing how they make use of the intranet and Internet;
- a report on an existing website;
- a report on setting up a planned website,
- a web page and host it online;
- evidence of configuring a single computer for Internet and e-mail access.

7.2 WHAT YOU NEED TO LEARN

You need to learn about:

- acronyms and technical terms used in communicating using computers;
- the Internet and intranets;
- the Internet and communications systems;
- web server requirements;
- Internet tools;
- Internet websites;
- setting up a computer system for use on the Internet.

7.2.1 Acronyms and Technical Terms used in Communicating using Computers

You need to understand the meaning of acronyms and technical terms used in communicating using computers, including:

- Internet access provider (IAP);
- Internet service provider (ISP);
- point of presence (POP);
- World Wide Web (WWW);
- universal resource locator (URL);
- domain-naming system (DNS) and registration;
- sub-domain naming;
- URL and e-mail redirection services;
- search engine;
- hypertext mark-up language (HTML);
- dynamic HTML;
- hypertext transport protocol (http);
- file transfer protocol (ftp);
- public domain software and shareware;
- inter-relay chat (IRC);
- personal digital assistant (PDA);
- advanced digital subscriber line (ADSL);
- integrated services digital network (ISDN);
- transfer control protocol/Internet protocol (TCP/IP);
- hard disk drive (HDD);
- random access memory (RAM);
- file transfer protocol (FTP).

7.2.2 The Internet and Intranets

In an organisation, information sources are identified as being either external or internal. You need to understand how the Internet, intranets and extranets are used by organisations by:

- identifying current usage;
- describing the advantages and disadvantages of the current usage;
- describing areas where the use of the Internet and intranet could be improved.

There are many services available through the Internet. You need to learn about a range of services and their purposes, including:

- e-mail;
- WWW;
- IRC, conferencing;
- newsgroups, Newsnet, bulletin boards;
- file transfer;
- Telnet.

You need to know about the organisation of the Internet, including:

- domains and DNS;
- mode of access to the Internet, IAP, ISP, POP and Internet services;
- international standards and protocols.

You need to explain the effects of different bandwidths and baud rates on the time taken to download web pages.

You need to know about different methods of connection to the Internet, including:

- data-connecting equipment (modem) and data-terminating equipment (computer), connectors and cables;
- wireless connections including those from mobile phones and PDAs;
- analogue telephone lines, digital telephone lines, cable and leased lines;
- satellite, ADSL, ISDN.

7.2.3 The Internet and Communications Systems

The Internet offers access to a wide range of information and communications services. You need to access and use the Internet. Use of the Internet allows you to find information using search and retrieval techniques.

You need to understand the costs involved in connecting to the Internet:

- ISP subscriptions;
- domain name registration fees;
- telephone charges.

7.2.4 Web Server Requirements

You need to understand the hardware and software requirements for setting up a website on a server, including:

- the operating system;
- web server software;
- protocols, e.g. TCP/IP;
- Internet naming (DNS) and addressing systems;
- security (firewalls, gateways);
- proxy servers;
- network card;
- router;
- components of a server:
 - number, type and speed of processor;
 - number, type and capacity of HDD;
 - number and type of RAM;
 - speed and type of network card.

You also need to identify the costs involved in setting up a website.

7.2.5 Internet Tools

You need to understand the purpose of Internet tools so that you can select appropriate tools to carry out a specific task. The tools you need to use are:

- browser software, bookmarks and search engines for accessing and searching the Internet;
- FTP tools for uploading and downloading files;
- web-editing software for creating and editing web pages.

You need to:

- access and search the Internet to view existing websites to obtain ideas on layout;
- download graphics and information;
- set TCP/IP address, domain name, address of the start-up home page and e-mail address for own use;
- identify the technical requirements for a website;
- create and test a website;
- access your own website.

7.2.6 Internet Websites

You need to understand the different technologies used to create a website and the reasons for the use of those technologies, such as:

- PHP (Hyper-Text Pre-Processor);
- ASP (Active Server Pages);
- CGI (Common Gateway Interface);
- Java;
- DHTML (Dynamic HTML).

You need to analyse a website, determine its purpose and produce a diagrammatic structure of the website.

You need to identify and explain basic script commands.

7.2.7 Setting up a Computer System for Use on the Internet

You need to:

- install and configure modem or network connection;
- install required software – browser, ftp, e-mail, virus checker, compression software.

E-mail is an important method of communication. You need to use both a LAN and the Internet to:

- send, receive and reply to e-mail messages;
- send and receive attachments;
- maintain an e-mail address book;
- file e-mail appropriately;
- virus check e-mail and attachments as necessary.

The web browser allows the user to view pages. You need to:

- add pages to favourites/bookmarks;
- configure the home page;
- alter settings such as display and security.

7.3 ASSESSMENT EVIDENCE GRID

Please see over.

Unit 7: Communicating using computers					
What you need to do:					
Your evidence needs to include:					
a [AO2] a report on an organisation detailing how they make use of the intranet and Internet [6]; b [AO2/3] a report on an existing website [12]; c [AO3] a report on setting up a planned website [9]; d [AO1/4] a web page and host it online [11]; e [AO1] evidence of configuring a single computer for Internet and e-mail access [12].					
How you will be assessed					
Task	Assessment Objective	Mark Band 1	Mark Band 2	Mark Band 3	Mark Awarded
a	AO2	You identify how the Internet and intranet are currently used and how they help the organisation meet its objectives; you make little or no attempt to describe any improvements the organisation could make to how it uses the Internet and intranet; [0 1 2]	you describe how the Internet and intranet are currently used, the advantages and disadvantages of the current use, and how they help the organisation meet its objectives; you identify one improvement the organisation could make to how it uses the Internet and intranet; [3 4]	you describe how the Internet and intranet are currently used, the advantages and disadvantages of the current use, and how they help the organisation meet its objectives; you describe improvements the organisation could make to how it uses the Internet and intranet. [5 6]	/6
	AO2	You identify the purpose of the nominated website and you describe two different services provided by the website; you identify the use of at least one Internet technology; [0 1 2]	you identify the purpose of the nominated website and you describe a range of different services provided by the website; you identify the use of at least two Internet technologies; [3 4]	you identify the purpose of the nominated website and you describe a range of different services provided by the website; you identify and explain the use of at least two Internet technologies. [5 6]	
b	AO3	You produce a diagrammatic structure of the website identifying titles of pages and hyperlinks; you show little or no evidence of understanding of code used in web pages; [0 1 2]	you produce a diagrammatic structure of the website identifying titles of pages and hyperlinks; you annotate the code used in at least three web pages; [3 4]	you produce a diagrammatic structure of the website identifying titles of pages and hyperlinks; you annotate and explain the code used in at least three web pages. [5 6]	/12

Unit 7: Communicating using computers (continued)					
Task	Assessment Objective	Mark Band 1	Mark Band 2	Mark Band 3	Mark Awarded
c	AO3	<p>You identify some of the costs, connection methods and hardware/software that need to be considered to create and host your planned website; you do not consider ISPs to host your website; your report may contain errors in spelling, punctuation and grammar;</p> <p>[0 1 2 3]</p>	<p>you describe a range of costs, valid connection methods and hardware/software, including bandwidth requirements, that need to be considered to create and host your planned website; you identify a suitable ISP for hosting your website; your report contains few spelling, punctuation and grammar errors;</p> <p>[4 5 6]</p>	<p>you describe a range of costs, valid connection methods and hardware/software, including bandwidth requirements, that need to be considered to create and host your planned website; you identify a suitable ISP and give reasons for its suitability for hosting your website in relation to its technical requirements; your report is consistently well-structured and there are few, if any, spelling, punctuation and grammar errors.</p> <p>[7 8 9]</p>	/9
d	AO1	<p>You create one web page from your planned website with no identification of Internet technologies used;</p> <p>[0 1]</p>	<p>you create one web page from your planned website and identify the use of at least one Internet technology used;</p> <p>[2]</p>	<p>you create one web page from your planned website and identify the use of at least one Internet technology used; you will host the web page online.</p> <p>[3]</p>	/11
	AO4	<p>You comment on your actions and role in creating and getting a web page hosted online;</p> <p>[0 1 2 3]</p>	<p>you include an analysis on your experiences in order to improve your own performance;</p> <p>[4 5]</p>	<p>you include an analysis on your experiences suggesting how you might approach a similar task in the future.</p> <p>[6 7 8]</p>	
e	AO1	<p>You identify some of the hardware/software and information required to set up a computer for Internet and e-mail access; you do not install any communication software; you make changes to two different browser configuration settings; you show evidence of setting up an appropriate filing structure for e-mails; you identify part of the installation process for the communication software;</p> <p>[0 1 2 3 4]</p>	<p>you identify the hardware/software and information required to set up a computer for Internet and e-mail access; you install one piece of communication software; you describe and produce evidence of two different configuration changes made to a browser; you produce evidence on sending and receiving e-mails and filing received e-mails; you identify the steps that you went through for the installation process for the communication software;</p> <p>[5 6 7 8]</p>	<p>you identify a range of hardware/software and information that could be used to set up a computer for Internet and e-mail access; you install three pieces of communication software; you describe and produce evidence of two different configuration changes made to a browser, and produce evidence on sending and receiving e-mails and filing received e-mails; you produce an installation guide for the communication software identifying all settings required.</p> <p>[9 10 11 12]</p>	/12
Total mark awarded:					/50

7.4 GUIDANCE FOR TEACHERS

7.4.1 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.

7.4.2 Guidance on Assessment

It needs to be stressed that you determine only the *mark* for a candidate's portfolio evidence and not the *grade* which will be determined by OCR.

Regular, early and constructive feedback to candidates on their performance is essential and crucial. Help with planning and structuring their portfolio work in a logical manner throughout the course will lead to better understanding of their work and is likely to achieve higher marks.

Giving candidates deadlines for the completion of various sections of their work, and encouraging them to adhere to them, is also essential if candidates are not going to rush to complete and possibly finish up with marks below their potential.

You need to mark each portfolio according to the assessment objectives and content requirements in the *Assessment Evidence Grid* (Section 7.3).

The information on this *grid* will eventually be transferred onto a *Unit Recording Sheet* to be attached to the front of each candidate's piece of work at the point when the work is submitted for moderation. A *Coursework Administration Pack* will be supplied, containing all relevant *Unit Recording Sheets*. Where marking for this unit has been carried out by more than **one** teacher in a centre, there must be a process of internal standardisation carried out to ensure that there is a consistent application of the criteria as laid down in the *Assessment Evidence Grids*.

Each row in the grid reflects the development of an assessment objective from a task or sub-task in the banner (there may be one or more assessment objectives to any particular task/sub-task).

The maximum mark for each *strand* of work (each row) is shown in the far right-hand column of the grid and this maximum mark is further broken down into a number of mark bands across each row with a range of descriptors.

You use your professional judgement to determine which descriptor in a strand (row) best suits the candidate's work and from the range of marks available within that particular mark band, you circle the mark that best fits the work. You then record this mark in the column headed *Mark*.

You should use the full range of marks available. You must award *full* marks in any strand for work which *fully* meets the criteria. This is work which is the best one could expect from candidates working at AS level.

Only **one** mark per strand/row will be entered. The final mark for the candidate is out of a total of **50** and is found by totalling the marks for each strand of work.

The further guidance below clarifies the criteria in the *Assessment Evidence Grid* and will help you to determine the appropriate mark to be awarded for each strand of work.

Amplification of Criteria			
Task	AO	Mark Band	Characteristics of the work one may expect to see at this mark band can be summarised as follows:
a	AO2	1	Candidates investigate how an organisation makes use of the intranet and Internet;
		2	once candidates have established the current use of the Internet and intranet, they describe the advantages and disadvantages of the use; they describe one improvement to the organisation's use of the intranet and Internet;
		3	candidates describe improvements to the organisation to enable it to make better use of the intranet and Internet.
b	AO2	1	Candidates <i>analyse</i> a website which uses two different web technologies and has at least three pages; candidates report on the <i>purpose</i> of the website – who the audience is, what the company expects the website to do, why it is there;
		2	candidates report on the <i>purpose</i> of the website – who the audience is, what the company expects the website to do, why it is there; candidates identify the services provided and the technologies used by the website;
		3	candidates describe the services provided and the technologies used by the website – they cannot just identify the technologies, rather they describe how the website is making use of those technologies.

Task	AO	Mark Band	Characteristics of the work one may expect to see at this mark band can be summarised as follows:
b	AO3	1	Candidates produce a diagrammatic site map of the website, showing links – titles of pages only are required, detailed diagrams of pages are not required;
		2	candidates produce a diagrammatic site map of the website, showing links – titles of pages are required, a print-out of the html code is included; candidates provide some annotation of the code that demonstrates they have some understanding of html – annotation of code covers formatting of the page, code to realise the text attributes and page colours for example;
		3	candidates produce a diagrammatic site map of the website, showing links – titles of pages are required, a print out of the html code is included; candidates provide annotation of the code that demonstrates they have understanding of html – annotation of code covers formatting of the page, e.g. code to realise the text attributes, page colours and page layout features (frames, tables, navigation bars etc.).
c	AO3	1	Candidates are looking at setting up a website – they are not actually setting up a site – the site they report on is the one they set up in Task d ; candidates look at the costs involved, different methods of connection, bandwidth requirements and the hardware and software requirements;
		2	candidates are looking at setting up a website – they are not actually setting up a site – the site they report on is the one they set up in Task d ; candidates look at the costs involved, different methods of connection, bandwidth requirements and the hardware and software requirements; candidates identify different ISPs and identify one that is suitable for their planned website;
		3	candidates are looking at setting up Internet sites – they are not actually setting up a site – the site they report on is the one they set up in Task d ; candidates look at the costs involved, different methods of connection, bandwidth requirements and the hardware and software requirements; the connection methods are different and valid for the organisation; the bandwidth requirements cannot just be given – there is some analysis showing how they have been reached; the hardware and software requirements are logical and complete; candidates identify different ISPs and identify and explain the reasons for the one that is most suitable for their planned website.

Task	AO	Mark Band	Characteristics of the work one may expect to see at this mark band can be summarised as follows:
d	AO1	1	Candidates create a single web page – they do not need to identify the requirements for their site or the information that would be required to host their site on the Internet;
		2	candidates create a web page that makes use of one Internet technology – they identify the Internet technology used;
		3	candidates create a web page that makes use of at least one identified Internet technology; candidates actually host the site on the Internet.
	AO4	1	Candidates comment on the steps that they went through to create a web page and host it online;
		2	candidates explain the steps that they went through to create a web page and host it online;
		3	candidates explain the steps that they went through to create a web page and host it online; additionally, they identify from experience how they would improve their technique to solve the problem if they were to repeat the process.
e	AO1	1	Candidates identify and list hardware and software for both Internet and e-mail access; they state what each piece of software is used for; candidates provide an explanation of the changes they made to the browser settings to demonstrate understanding; they are able to send and receive e-mails; e-mails received are filed appropriately; candidates identify some of the process that they carried out to install the communications software; the steps may be just a bulleted list;
		2	additionally, candidates install one piece of communication software; candidates provide documentation on the installation so it could be repeated – this forms part of the technical documentation for the system; candidates explain why an e-mail server is required and provide an evaluation against these requirements at the end of the task; candidates identify the process that they carried out to install the communications software;
		3	additionally, candidates install three pieces of communication software; candidates configure the browser software in two different ways; they describe the changes although they do not explain the changes; they also consider the file structure needed for sending and receiving e-mails and set up the file structure; this is the most complicated part of all the tasks – it requires each candidate to set up an e-mail server and an e-mail client; they set up at least two users and send and receive e-mail between the two users; candidates explain why an e-mail server is required and provide an evaluation against these requirements at the end of the task; candidates provide documentation on the installation so it could be repeated – this forms part of the technical documentation for the system.

7.4.3 Resources

Textbooks	<p>Dean T <i>Network+ Guide to Networks</i></p> <p>Hunt C & <i>Windows NT TCP/IP</i> Thompson RB <i>Network Administration</i></p> <p>Lowe D <i>Networking All-in-one Desk Reference for Dummies</i></p> <p>Networking <i>CCNA 1 and 2: Companion guide</i> Academy Program Cisco</p> <p>Networking <i>CCNA 3 and 4: Companion guide</i> Academy Program Cisco</p> <p>Tanenbaum A <i>Computer Networks (International edition)</i></p> <p>Wegner JD <i>IP Addressing and Subnetting</i> & Rockell R <i>Including Ipv6</i></p>
Websites	<p>General: http://www.cisco.com/ – Cisco Systems http://www.wown.com/ – World of Windows Networking</p> <p>Manufacturers: http://www.dlink.com http://www.hp.com/ http://www.linksys.com/ http://www.netgear.com</p> <p>News Sites: http://wifinetnews.com/ http://www.comnews.com/ http://www.networkcomputing.com/</p> <p>Notes: http://www.scit.wlv.ac.uk/~cm1950/CP3397/ – various notes on networking http://www2.rad.com/networks/netterms.htm – tutorials on networking</p>

