

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

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Methodical recommendations
for practical classes
on an academic discipline

“FOREIGN LANGUAGE FOR PROFESSIONAL PURPOSES”

Part II

*(for first-year full-time students first (bachelor’s) level of higher education
specialty 122 – Computer Sciences, 126 – Information systems and technologies,
174 – Automation, computer-integrated technologies and robotics)*

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Methodical recommendations for practical classes on an academic discipline “Foreign language for professional purposes”. Part II (for first-year full-time students first (bachelor’s) level of higher education specialty 122 – Computer Sciences, 126 – Information systems and technologies, 174 – Automation, computer-integrated technologies and robotics) / O. M. Beketov National University of Urban Economy in Kharkiv; comp.: O. V. Havrylova, O. O. Hnatysheva, O. L. Ilienکو. – Kharkiv : O. M. Beketov NUUE, 2024. – 33 p.

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UNIT 1

THE INTERNET

The Internet (commonly called **the Net**) is the connection of networks across the world. Different services are made available on the Internet including:

email (electronic mail)	sending and receiving text messages.
Usenet (user network)	accessing newsgroups (groups of users who send and read messages on a particular topic).
IRC (Internet relay chat)	chatting to other users using text messages in real-time (immediately, while users are logged on to the system).
FTP (file transfer protocol)	copying files e.g. program files, between computers on a network. Copying files from a server computer to a client computer is known as downloading and copying from a client to a server is uploading .
Telnet (telephone network)	logging on (connecting to a network system account, normally using a password) to your local server from across a network communications system at a distance e.g. from another country.
MOOs (Multi-user domain that is object-oriented)	taking part in simulations in a shared environment. Each person assumes a person and communicates using text messages.
WWW (the World Wide Web, commonly referred to as the Web)	browsing (moving from webpage to webpage) linked documents known as webpages .

Computer-Mediated Communication (CMC) is a term used to describe systems that allow users to communicate using a computer network.

1 Basics

Networked computers allow users to communicate with each other. At present most of this communication is written although video- and audio-conferencing permit

speech. Most computer-mediated communication (CMC) is **asynchronous** i.e. the participants are not on line at the same time and there are delays between messages. Examples of asynchronous communication include: mobile phone text messages, chat rooms, email, bulletin boards and newsgroups/discussion. **Synchronous** CMC depends on participants being on line at the same time. There may be a few seconds' delay — like a satellite phone call — but the communication is closer to face-to-face interaction. Examples of synchronous communication include: Internet Relay Chat, MOOs, audio and videoconferencing.

With the exception of **videoconferencing** (a form of communication over a network that uses video cameras so that the people taking part can see and hear each other), there is no opportunity for paralinguistic features such as gesture. To compensate, users have developed a number of strategies which account for the linguistic features of text-based CMC including: abbreviations and acronyms, e.g. LOL, simplified syntax — subject and modal deletion (C U L8R), tolerance of surface errors — typographical/spelling errors, symbols and exclamation marks, etc. to express emotional meaning e.g. Yeees!!, symbols indicating emotions called emoticons e.g. :-), formulaic phrases, **emotes**, to display action in a chat room, e.g. looks round nervously. Discourse features vary from mode to mode but for emails include omitting salutations and quoting previous messages in whole or part.

Most users connect to the Internet, using a modem (modulator/demodulator an electronic device that converts signals to enable a computer to be connected to an ordinary telephone line), through a server and router owned by an **ISP** (Internet service provider). Often they have to pay the ISP a fee to make a connection but some ISPs provide a free connection, usually depending on advertising on the webpages to pay for the service or charging premium rate telephone line charges for helplines that provide help and support services. With free ISPs, the user only pays for the telephone call connection which is usually a local connection.

To attract users to connect through their system, ISPs offer various options including: an unlimited number of email addresses (unique address codes used to contact someone using electronic mail) with filtering of email to remove **junk email**

(unwanted and unsolicited email normally advertising or trying to sell something), unlimited **Web space** (file storage space for storing webpage files) for setting up your own **website** (a set of related pages stored on a Server on the World Wide Web) and **virus checking facilities** (for checking your computer files to detect programs written with the purpose of causing damage or causing a computer to behave in an unusual way). **Web-based mail** allows users to access their email from any computer with Internet access. **POP3** email however requires a special email program but is faster and more efficient. Users **register** (open an official account) with the ISP, using a program provided on a CD-ROM or by filling out details on a webpage while online (connected to the Internet).

Exercises

1. Explain the meaning of the words in bold.

2. What do these abbreviations mean?

POP3, ISP, CMC, WWW, MOOs, FTP, LOL.

3. Choose the best word from each pair in bold.

What's the difference between the Web and the internet?

Some people think that the internet and the Web are the same thing, but in fact they are different. The internet (often called simply "the net") is a global **network / net** of interconnected computers.

These computers communicate with each other **over / through** existing telecommunications networks – principally, the telephone system. The World Wide Web (usually known as just "the Web") is the billions of web pages that are stored on large computers called web **servers / services**.

To **see / access** the web, you need a computer and a modem. You then connect over your telephone line to an internet service **port / provider** (ISP), which sends your request to view a particular web page to the correct web server.

Websites are not the only service available on the internet. It is also used for many other functions, including sending and receiving email, and connecting to newsgroups and **discussion / talking** groups.

You could say that the internet is a system of roads, and web pages and emails are types of traffic that travel on those roads.

4. Answer the questions about browsers Answer True or False for each one.

1. All browsers (Internet Explorer, Mozilla Firefox etc) have exactly the same functions.
2. Cookies are data sent by an internet server to a browser. They identify the user, and track the user's access to the server.
3. You can get your browser to delete the cookies it has stored. (In Internet Explorer go to **Tools**, then to **Internet Options**, then to **Delete Cookies**.)
4. Pages you have viewed are stored in the Temporary Internet Files folder. These cannot be deleted.
5. You can tell your browser how long to store web addresses in the History.
6. You can set your browser to block pop-up windows.
7. All pop-ups are advertisements.
8. You can add extra toolbars to your browser window, for example a toolbar from Google.

UNIT 2

THE WORLD WIDE WEB

The **World Wide Web** (commonly referred to as **WWW** or the **Web**) is a service on the Internet. It consists of a sets of linked documents known as **webpages** which can be viewed using a program called a **browser**. The links on a webpage (called **hyperlinks**) contain the Web address of the webpage that will be displayed if the user clicks on the link.

The **Web address** of a webpage is also known as a **URL** (Uniform Resource Locator) eg. <http://www.hw.ac.uk/libWWW/irn/im.html>. The URL consists of a number of separate parts divided by forward slashes (/).

This example indicates the following:

<http://> is known as the **protocol prefix** and indicates that the **hypertext transfer protocol** (an agreed communications standard for webpages) should be used to transfer the webpage across the Internet.

www indicates that this is a World Wide Web document i.e. a webpage.

hw.ac.uk is the **domain name** and indicates the network domain in which the webpage is stored.

[ac](http://hw.ac.uk) is the **domain name extension** and indicates the type of domain e.g. [ac](http://hw.ac.uk) or [co](http://hw.co.uk) or [com](http://hw.com) is a company.

[uk](http://hw.ac.uk) is the **country code** indicating that this webpage is stored on a computer in the United Kingdom.

[libWWW/irn](http://hw.ac.uk/libWWW/irn) gives the **path** of the directory (or folder) where the webpage is stored on the server.

[irn.html](http://hw.ac.uk/libWWW/irn.html) is the name of the **webpage file**. The **extension** used in webpage filenames is either [htm](http://hw.ac.uk/libWWW/irn.htm) or [html](http://hw.ac.uk/libWWW/irn.html) to indicate that the file is written using **HTML** (hypertext markup language).

When a user clicks on a hyperlink on a webpage, the browser program contacts a server computer known as a **DNS** (Domain Name System) **server** to look up the **IP** (Internet Protocol) **address** (the unique 32-bit binary number) of the remote **Web server computer** (the computer storing the webpages) given in the URL of the linked webpage. The DNS has a stored table of names and addresses of **nodes** (a network terminal or point where a computer is connected to a network) on the Internet. The request for the linked webpage is then sent to a computer or electronic device known as a **router** that uses the Internet address obtained from the DNS server to route the request (decide on the best Internet path to send the request).

The message requesting the webpage is divided up into small sections called **packets** and each separate data packet is passed from router to router until they all

reach the remote Web server where they are put back together again. The remote Web server sends the requested webpage back to the **browser computer** that made the request in a similar way using the IP address of the browser computer to determine the best available route for each packet. When the packets arrive at the browser computer, they are combined and the requested webpage is displayed in the browser.

Special websites (e.g. AltaVista) provide a facility known as a **search engine** that can be used to search for other websites. A search engine uses special programs to collect information about websites on the World Wide Web and stores the information in a **database** (a type of applications program used for storing information so that it can be easily searched and sorted). The user can then search the database to obtain a list of links to relevant websites. To search using a search engine, the user types words (known as **keywords**) into a text box (called a **search box**). The search engine then displays a list of website links that are relevant to the given keywords. Keywords can be used to form **search phrases** by putting quotation marks around the keywords and they can be combined in different ways using special logical **operators** such as the words OR, AND or NEAR which can be grouped by enclosing them in brackets. Sometimes, symbols such as + or — can be used to represent the operators. Special symbols known as **wildcards** can also be used with keywords. These symbols represent certain characters or combinations of characters. For example, an asterisk (*) is often used to represent any combination of characters. A search for ‘col*’ would look for any word beginning with ‘col’.

As well as **keyword searches**, search engines can be used for **field searches**. This allows the user to search webpage fields such as the title field of a webpage or its Web address. The **Web address** is sometimes referred to as its **URL** (uniform resource locator).

The user can store the links to useful websites using a **bookmark** facility in the browser program used to view the webpages. The webpage that is set to be displayed when the browser program is first started is referred to as the user’s homepage. The user can return to the **homepage** by clicking a button known as the **Home button** in the **toolbar** at the top of the browser program.

Because a video signal contains so much data, it is difficult to **download** it from an Internet server (copy it to a client computer from a server computer), in **real-time** i.e. so that it can be viewed immediately without any delays or gaps. The connection would need to have a huge **bandwidth** (signal capacity). One way of doing this with a normal Internet connection involves using a section of memory as a **storage buffer** (a storage area for temporarily storing data from a fast source so that it can be fed at a steady rate to a slower system). This allows part of the video signal to be downloaded and stored so that the user can begin to view the video before it is completely downloaded. Feeding the video signal from the storage buffer to the display makes space in the storage buffer for more of the video to be downloaded. Therefore, as the user is watching the first part of the video, the next part is being downloaded into the Storage buffer. The video can therefore be shown to the user at a steady rate. This method of downloading video signals using a storage buffer to obtain a steady display is known as **streaming**.

Exercises

1. Explain the meaning of the words in bold.

2. What do these abbreviations mean?

URL, IP, DNS, HTML.

3. What does the following address say you?

<https://www.kname.edu.ua/>

4. Fill in the gaps.

click on	criteria	database	hyperlinks
keywords	matches	media	refine
returns	sponsored	view	

What's the difference between a web directory and a search engine?

Web directories (for example, Excite, Lycos) list categories and sub-categories with links to websites. Search engines (for example, Google, Altavista) search the Web for web pages according to the instructions that you give them.

Stage 1: Enter one or more _____.

Stage 2: The search engine looks for _____ in all the web pages on their _____.

Stage 3: The search engine _____ the matches (or "hits") with _____ to the web pages.

Stage 4: The search engine may also return "_____ links". These are links to the websites of companies who have paid the search engine company.

Stage 5: You _____ the hyperlink to _____ the web page.

Stage 6: If necessary, you can _____ your search by using advanced search _____ such as language, country or the type of _____ you are looking for.

UNIT 3

WEBSITES

A set of related **webpages** (hyperlinked documents in a web network system) stored on a **Web server** (a server computer that stores and provides access to webpages) is known as a **website**. A **Webmaster** is a person who sets up and maintains a website. The design of websites varies greatly and some are more successful than others. Features of a good website include:

1. Good webpage design.
2. A good **navigation** system (a way of allowing visitors to move from webpage to webpage and find their way around your website). Navigation features should include:

a) Using text hyperlinks, rather than graphical buttons or **image maps** (graphical images that provide links to different webpages depending on where on the image the user clicks).

b) Providing descriptive text captions for any graphics. These alternative text captions are known as **ALT text captions**.

c) Providing a webpage that gives an overview to the website with links to various related pages grouped together. This is known as a **site map**. (**FAQs** are the common name for frequently asked questions about the website).

d) Avoiding **frames** which are a way of dividing the browser screen into separate windows, each with its own **scrollbar** for moving up or down through the text. Frames allow webpages to be displayed inside other webpages.

e) Keeping the website consistent by not changing the location of the navigation elements and not using links and buttons that appear and disappear.

f) Making it easy to reach any particular content on the website.

g) Providing multiple paths through a website by using logical, clearly placed links rather than using a **search engine function** (a program designed to find information according to data entered by the user) where the user has to type in **keywords** (words used to categorise documents or records in a file) to find data.

h) Not giving website visitors an overwhelming number of links to follow.

3. Website ease of use.

4. Accurate and up to date data provided on the website.

5. Good use of graphics on the webpages.

6. Website compatibility with different types of Web browser programs i.e. using webpage features that are standard and can be displayed on a variety of common browser programs.

Access to the Internet is normally made through an **ISP** (Internet Service Provider). ISPs are organisations that normally charge a fee to provide the server computers, Internet services and Internet connections for users. Some ISPs get their money from advertising and provide the Internet connection free, the user only paying for the telephone call. However a number of factors should be taken into consideration

when deciding which ISP to use. These include:

1. **Sign up software on CD-ROM.** The ISP provides software on a CD-ROM disk that makes it easy for the users to set up their computers to connect to the Internet.

2. **Local call rates and national call rates for online time.** The user pays for a telephone call while they are online (connected to the Internet). If the ISP is local, the user need only pay local telephone call rates. If the ISP is not local the user will have to pay national telephone call rates to connect to the ISP.

3. **Initial set-up fee.** Although the ISP may not normally charge for providing the Internet connection, they sometimes make a small charge for first setting up the connection.

4. **Web-based and POP3 email.** ISPs often provide free email facilities. This may be in the form of **Web-based email** that uses a **browser program** to access the email or **POP3 email** that uses special **POP3 email client programs** for copying email messages onto the user's computer and allows the user to read and send messages through an **email server computer**.

5. **Free Web space.** Most ISPs provide storage space for users on a Web Server computer where the users can set up their own websites.

6. **Access to newsgroups.** Most ISPs provide access to the Internet **Usenet** service that allows users to subscribe to discussion groups, known as **newsgroups**, that discuss particular topics, using text messages that can be accessed by all members of the group.

7. **Customer support.** Most ISPs provide a help service that enables customers to obtain help for common computing problems. The ISP often charges for this type of support.

8. **Reliable service.** The users rely entirely on the ISP to provide their Internet connection. Some ISPs are better than others at maintaining their systems and providing a connection that is fast enough.

9. **Multiple ISP accounts.** A username and password (a secret code used to control access to a network system) is required to access a user's own storage areas and services on the ISP's server computer. Some ISPs provide more than one such **account**

to a user enabling the same system to be used by different members of the family or for one user to keep business and personal data completely separate.

Exercises

1. Explain the meaning of the words in bold.

2. Evaluate the website of your university.

- 1) Are the pages simple and easy to digest or are they cluttered with too much information and too many links? Has the designer considered: Who is the site for? What information do they need? How do they want the information presented?
- 2) Is it easy to move round the site? Can you see the route you've taken from the home page to your current location? Can you get back to the home page with a single click?
- 3) Is the site easy to use?
- 4) Is the information contained accurate and reliable?
- 5) Is the site kept up to date?
- 6) Are the graphics included simply to make the site look more attractive or do they serve a useful purpose?
- 7) Can most browsers access the site without difficulty?

3. Match the browser toolbar button with the function.

1. Back	a. Shows a list of the websites you have visited recently.
2. Forward	b. Opens the media bar, accessing internet radio, music, video etc.
3. Stop	c. Displays the page you were on before.
4. Refresh1 / Reload2	d. Shows the latest version of the page.
5. Home	e. Opens the search panel.
6. Search	f. Displays the page you were on before using the Back button.

7. Favourites1 / Bookmarks2	g. Displays the page you have set as your home page.
8. Media	h. Prints the current page.
9. History	i. Stops a page from downloading.
10. Mail	j. Displays the web addresses you have chosen as your favourites.
11. Print	k. Shows email options.

4. Put these operations in the order that you do them (variations are possible).

	close down your browser
	connect to your ISP
	disconnect from the internet
	enter a web address (also known as a URL) into the address field
	launch your browser (for example, Internet Explorer, Netscape Navigator or Mozilla Firefox)
	perhaps wait for a few seconds while the web-page downloads
	view the page

UNIT 4

COMMUNICATIONS SYSTEMS

Mobile phones have become a common way of communicating. They are small computing devices in the form of a telephone handset that can connect to local radio networks, allowing users to make normal telephone calls. They often have extra hardware and software features including: keyboards; earphones; a **phone book** in the form of a database for storing telephone numbers; **text messaging** that allows short text messages to be transmitted and received (the text messages are displayed on a small screen built into the handset); a **calls register** that stores details of any telephone calls that are sent or received; computer games programs that can be **downloaded**

(copied from a server computer) and played on the handset; a program that allows the handset to be used as a mathematical calculator; and an **alarm call facility** that automatically causes the handset to ring or a message to appear on the screen at a time chosen by the user. When sending text messages, abbreviations consisting of letters and numbers are used to save typing and to make it easier to display the messages on the small screen e.g. CU L8R is commonly used to represent 'see you later'.

The messages are transmitted in a way that conforms to a special communications **protocol** i.e. according to an agreed standard. A common protocol used with mobile phones is called **WAP** (wireless application protocol). In a Wap system, messages are divided into small units called packets. The **packets** are transmitted separately over the radio network system and are put together to form the original message when they arrive at their destination. By sending packets belonging to a number of different users along the same connection, the system can be used by many people at the same time. Wap allows mobile phone users to use Internet **online services** such as **email** (electronic mail) and browsing webpages on the **World Wide Web**. Normal webpages written in **HTML** (hypertext markup language) cannot be used with Wap phones. Wap webpages are specially prepared using **WML** (wireless markup language) so that they can be used on handset screens. A newer language called **XML** (extensible markup language) will be used in the future, enabling webpages to be created that can be used in normal computer browser programs and on mobile phone screens. The high **bandwidth** (signal capacity) available using Wap also enables video transmissions to be received by mobile phones. More sophisticated communications systems providing higher bandwidths, such as **GPRS** (General Packet Radio Service) and **UMTS** (Universal Mobile Telecommunications System), are likely to replace Wap in the future.

In the future, computers will become more **powerful** (faster and with bigger storage and processing capacity). They will also become cheaper to produce. This will make them more commonly available and allow them to be integrated with other devices such as **videorecorders** (a device for recording video signals onto magnetic tape cassettes), TVs and telephone systems. They may not even be called computers in

the future, but computing devices will be designed for particular purposes and thrown away when they become faulty. Cheaper and more compact, flat **digital panels** are likely to be used for monitor screens in the future and security will be provided by **biometric devices** rather than passwords i.e. devices that measures some aspect of a living being e.g. eye scanning devices or fingerprint recognition devices. It will also become cheaper and more common to print photographs from a camera using a colour laser printer. Flexible **motherboards** (the electronic circuit boards that hold and connect the main parts of a computer) will allow the design of computers to be more varied in the future. **Voice control** will allow the user to input data and control the computer by speaking. In the future, software will be rented and run across the Internet rather than being bought and installed on individual computers. They will be built into clothing and worn by the user. Domestic appliances such as fridges and cookers will be computer controlled. In the longer term, computers may be operated using laser light or quantum physics rather than electronics and may even be implanted into the user's body, even into the human brain. This may help people with disabilities.

Computer-mediated communication (CMC) can be either synchronous, where the users can communicate with each other at the same time in **real-time** i.e. immediately, enabling interactive communication; or it can be asynchronous, where messages are sent to a user who receives them and replies at a different time. Some messages are text only, some are audio only and others are multimedia (include text, graphics, audio, animation and video data).

A **pager** is a small radio receiver which beeps to alert the wearer of messages or telephone calls. It displays the telephone number of the caller so the wearer can call back. Some pagers can display very short messages.

A **bulletin board** is an electronic noticeboard system that enables users to display messages for other users to read.

A **MOO** (multi-user object oriented) system is an Internet virtual environment, developed from multi-user adventure games, that allows many users to interact in real time.

A **GPS** (Global Positioning System) receiver uses a microprocessor (the main

electronic chip in a computer that does the main processing and controls the other parts of the computer) to compare coded **digital signals** (an electronic signal that has only two states i.e. off or on) from special satellites orbiting the earth to calculate latitude, longitude and altitude, and enable the user to determine their exact location. Extremely accurate atomic clocks are used in the satellites. GPS systems, although originally developed for the US military, can be used for a variety of purposes including orienting hikers, navigating ships, tracking trucks and buses, and locating stolen cars.

Exercises

1. Explain the meaning of the words in bold.

2. What do these abbreviations mean?

GPS, Wap, MOO, CMC, GPRS, WML, XML, UMTS.

3. Do you have a mobile phone? What do you use it for? What make is it? How often do you use it per day? What additional features does it have? Does it have a calculator?

4. Fill in the gaps.

attach	browse	field	inboxes
open	send	size	

You can send almost any file as an attachment. _____ through the folders on your computer until you find the file you want to attach. Click on " _____ ". The file will appear in the attachments _____. Then click " _____ ", and wait while the file uploads. Add more files if you wish. When you have finished adding files, click " _____ ". Some email _____ will only receive attachments up to a certain _____ with one email, for example 10MB. If you need to send a lot of very big attachments, it's sometimes necessary to spread them over a number of separate emails.

UNIT 5

COMPUTING SUPPORT

Computing support involves setting up and maintaining computing systems and solving **hardware** (the physical components of a computer system) and **software** (programs and data) problems. Common problems include: dealing with **viruses** (programs that can reproduce themselves and are written with the purpose of causing damage or causing a computer to behave in an unusual way); fixing faulty **peripherals** such as monitors, mice or printers; dealing with computers **hanging** (suddenly and unexpectedly stopping processing during the execution of a program); or computers **crashing** (failing suddenly and completely). It is usually the failure of the hard disk inside a computer that is referred to as a crash.

New computers commonly have a one-year **warranty** agreement that allows the purchaser to obtain help with computing problems by telephoning computing support staff at a **help centre**. Each computer has its own unique **serial number** that identifies the equipment. It also usually has a **service tag number** that identifies its warranty agreement to the support staff. A **job number** is usually issued by the support staff to uniquely identify the particular fault report. Special fault report forms are often used by the support staff to record the details of the problem. To solve the problem the support staff usually need to know the type of computer, type of processor, amount of **RAM** (random access memory — the memory that stores the user's program and data while they are being used by the computer), the operating system and what type of **LAN** (local area network — a network connected over a small area) it is connected to, if any.

The problem reported to the help centre in this unit involves **MIDI** (musical instrument digital interface) sound files. MIDI files are created by connecting a musical instrument to a computer system. This type of music file is commonly found on the Internet and is used in **Microsoft Encarta**, a multimedia encyclopaedia program produced by the Microsoft Corporation. The faulty computer has 128 **megabytes** of RAM (approximately 128 million **bytes** — a byte is the amount of memory required to store one character e.g. a letter, a number or a punctuation mark). The fault is caused

by a faulty **sound driver** (an operating system program that controls the sound system in the computer). The help centre will usually try to solve the problem over the phone but if that is not possible, the computer may have to be returned for repair or they may send out a **repair technician** to the user's location. Many simple computer problems can be fixed by simply **rebooting** the computer (restarting the computer operating system). Some computers have programs for testing and diagnosing hardware faults stored in **ROM** (read only memory) on the **motherboard** (the main electronic circuit board inside a computer that holds and connects together all the main electronic components). These stored programs are known as **on-board diagnostic and repair tools**. To save users having to telephone the help centre to solve well known common problems, the company selling the computer may have a website with a **FAQs** (frequently asked questions) section that describes common problems and their solutions.

The Microsoft Corporation has a website with a section known as the **Microsoft Knowledge Base** that allows Microsoft software users to find out about known problems with using Microsoft software with certain combinations of hardware. It provides a description of the problem and any known solutions to the problem. The Microsoft software problems used in this unit include a problem using a free Microsoft email program called **Outlook Express** and the **Dial-Up Networking** feature in a Microsoft operating system. Dial-Up Networking allows the user to connect their computer to a network using a modem. The problem occurs with a particular make of **video adapter** (the expansion card that provides the electronics for controlling the monitor screen). The other Microsoft software problem is with **Internet Explorer** (a free **browser** program used for viewing webpages) causing the computer to **hang** (to suddenly and unexpectedly stop processing during the execution of a program). The solution is to change the Settings in the program that determine whether the program should **hang up** (disconnect the telephone line when it has finished sending, receiving or **downloading** i.e. copying data from a server computer to the user's computer).

Exercises

1. Explain the meaning of the words in bold.

2. What do these abbreviations mean?

MIDI, LAN, FAQ, RAM, ROM.

3. Answer the questions.

- 1) What mark and model of computer do you have?
- 2) Is the computer still under warranty?
- 3) What is the service tag number?
- 4) What type of processor do you have in the computer?
- 5) How much RAM is installed?
- 6) What operating system are you using?
- 7) Is the computer connected to any kind of network? What type of network?
- 8) Can you describe the problem if any?

UNIT 6

DATA SECURITY 1

There are a variety of different crimes that can be committed in computing, including:

Computer Crime	Description
Spreading viruses	distributing programs that can reproduce themselves and are written with the purpose of causing damage or causing a computer to behave in an unusual way
Hacking	gaining unauthorised access to a network system
Salami shaving	manipulating programs or data so that small amounts of money are deducted from a large number of transactions or accounts and accumulated elsewhere. The victims are often

	unaware of the crime because the amount taken from any individual is so small.
Denial of service attack	swamping a server with attack large numbers of requests
Trojan horse	a technique that involves adding concealed instructions to a computer program so that it will still work but will also perform prohibited duties. In other words, it appears to do something useful but actually does something destructive in the background.
Trapdoors	a technique that involves leaving, within a completed program, an illicit program that allows unauthorised - and unknown - entry
Mail bombing	inundating an email address with thousands of messages, slowing or even crashing the server
Software piracy	unauthorised copying of a program for sale or distributing to other users
Piggybacking	using another person's identification code or using that person's files before he or she has logged off (disconnected from a network account)
Spoofing	tricking a user into revealing confidential information such as an access code or a credit-card number
Defacing	changing the information shown on another person's website
Hijacking	redirecting anyone trying to visit a certain site elsewhere

A **computer virus** is a program that can reproduce itself and is written with the purpose of causing damage or causing a computer to behave in an unusual way. It **infects** other programs i.e. it attaches itself to other programs, known as **host programs**, and therefore reproduces itself. It operates by replacing the first instruction in the host program with a **JUMP command**. This is a command that changes the

normal instruction sequence in a program, causing the virus instructions to be **executed** (processed by the processor) before the host program instructions. When the virus has been executed, the host program is executed in the normal way.

When it attaches to operating system programs to integrate itself with the operating system (the set of programs that control the basic functions of a computer and provide communication between the applications programs and the hardware), it is said to have **patched** the operating system. Viruses normally attach themselves to programs that have a COM extension (e.g. command.com) that are known as command files or **COM files**, or to programs that have an EXE extension (e.g. explorer.exe) that are known as executable files or **EXE files**. A virus is **loaded** into memory (copied from the storage media into memory) when a program it has attached itself to is **run** or **executed** (processed by the processor). It then becomes **memory resident** i.e. it stays in the memory until the computer is switched off. When the virus is **triggered** by a predetermined event, it operates the **payload** (the part of the virus that causes the damage). Although a virus is the term used to describe any program that can reproduce itself, viruses usually have four main parts:

- a) a **misdirection routine** that enables it to hide itself;
- b) a **reproduction routine** that allows it to copy itself to other programs;
- c) a **trigger** that causes the payload to be activated at a particular time or when a when a particular event takes place;
- d) a **payload** that may be a fairly harmless joke or may be very destructive.

A program that has a payload but does not have a reproduction routine is known as a **Trojan**. Each virus is given a name e.g. Love Bug and can be classified as a particular type of virus. Virus types include: **logic bombs** that destroy data when triggered; **boot sector viruses** that store themselves in the **boot sector** of a disk (the part of a disk containing the programs used to start up a computer); **file viruses** that attach themselves to COM files; **macro viruses** that are small macro programs that attach themselves to wordprocessor files and use the macro programming facilities provided in some wordprocessor programs.

Exercises

1. Explain the meaning of the words in bold.

2. Discuss the following problems:

- 1) Damaging effects of the love bug virus.
 - 2) Illegal hacking into Microsoft's software codes.
 - 3) Scheme to make money illegally using Web phones.
- the questions, it is worth reading on with more care.

3. Match the malware with the damage.

1. virus	a. collects and sends private information from the infected computer to a third party
2. spyware	b. an undesirable program which can replicate itself across a network
3. trojan horse	c. allows a hacker to access private information when he/she wishes
4. keystroke logger or keylogger	d. a program which adds itself to an executable file, and can cause considerable damage to the data on the infected computer
5. worm	e. records characters that are typed into a computer

UNIT 7

DATA SECURITY 2

There are a variety of security measures that can be used to protect hardware (the physical components of a computer system) and software (programs and data) including:

1. **Controlling physical access** to hardware and software.
2. **Backing up** data and programs (storing a copy of files on a storage device to

keep them safe).

3. **Implementing network controls** such as:

a) using **passwords** (a secret code used to control access to a network system);

b) installing a **firewall** (a combination of hardware and software used to control the data going into and out of a network. It is used to prevent unauthorised access to the network by hackers);

c) **encrypting data** (protecting data by putting it in a form only authorised users can understand);

d) installing a **callback system** (a system that automatically disconnects a telephone line after receiving a call and then dials the telephone number of the system that made the call, to reconnect the line. It is used in remote access systems to make sure that connections can only be made from permitted telephone numbers);

e) using **signature verification** or **biometric security devices** (security devices that measure some aspect of a living being e.g. a fingerprint reader or an eye scanner).

4. **Separating and rotating the computing functions** carried out by employees and carrying out periodic **audits** of the system i.e. observing and recording events on the network systematically.

5. **Protecting against natural disasters** by installing **uninterruptible power supplies** (battery backup systems that automatically provide power to a computer when the normal electricity source fails) and **surge protectors** (electronic devices that protect equipment from damage due to a sudden surge in a power supply).

6. **Protecting against viruses** by using **antivirus programs** (computer programs or sets of programs used to detect, identify and remove viruses from a computer system) and ensuring that all software is free of viruses before it is installed. Particular care must be taken when using **public domain software** (free software) and **shareware** (software that is free to try out but must be paid for if it is used after the trial period).

A **smart card** is a plastic card containing a processor and memory chip. It can be used to store large amounts of confidential data including coded data that can be used as **digital cash** (electronic currency that is used for making electronic purchases

over the Internet). It can also be used as a Security device to prevent or allow access to a system and allow a user to withdraw cash from a bank **ATM** (automatic teller machine - a type of machine used by banks for enabling customers to withdraw money from their bank accounts). A **smart card reader** is a device used for reading smart cards by detecting radio signals emitted from a radio **antenna** (aerial) in the form of a small coil inside the smart card.

An **anti-virus program** is a program that checks files for virus coding instructions inside another program and can be used for removing any virus coding instructions detected.

A **backup program** is a program that stores a copy of data on a storage device to keep it safe. There are different kinds of backup, including:

a) **Incremental backup** which copies all the selected files that have been created or changed since the last full, differential or incremental backup. These files are identified by the fact that their **archive bit** would be on. The archive bit is a digital bit stored with a file indicating if the file has been backed up since it was last edited. The archive bit is switched off when the file is backed up using a full or incremental backup.

b) **Differential backup** which copies all the files created or modified since the last full backup. The archive bit is not set to 'off' by a differential backup.

c) **Full backup** which copies all the selected files on a system, whether or not they have been edited or backed up before.

A series of incremental backups and a full backup, or the most recent differential backup and a full backup, is known as a **backup set**.

Exercises

1. Explain the meaning of the words in bold.

2. How can we protect our computer data? How often do you scan your computer? What preventative measures can we use to protect our computers? What virus protection programs do you use? Explain your choice.

UNIT 8

RECENT DEVELOPMENTS IN IT

An **electronic newspaper** is an electronic device that connects to the Internet and displays news items on a display screen.

A **channel** is a path for the transmission of data.

A **gigabit per second** is a communications speed of approximately one thousand million binary digits every second.

A **fibre** refers to a strand of glass fibre used in fibre optics cable which carries data using the reflection of laser light.

Visual computer personalities refers to digital images with human characteristics that are used as an interface between the user and a computer system.

A **hydraulic chair** is a chair that has moving parts that are operated using fluid pressure.

VR games are **virtual reality games** i.e. computer games that use a simulated three-dimensional environment that surrounds the user and is generated by a computer.

An **intranet** is an internal network webpage system that operates using the same protocols (agreed communication standards) as the Internet.

The Internet is the connection of computer networks across the world.

A **wearable health monitor** is a computerised medical device built into clothing so that it can be worn by the user to take measurements of certain aspects of the user's health.

A **robot** is a mechanical device controlled by a computer.

A **terabit** is a unit of storage capacity equal to approximately one million binary digits.

Optical fibre is the glass fibre used in fibre cable that carries data using the reflection of laser light.

A **robotic pet** is a mechanical device in the form of a pet animal, such as a dog, that is controlled by a computer.

Robotic devices within blood vessels refers to computer-controlled mechanical

devices that are small enough to be inserted into human veins and arteries that carry the blood around the body.

Artificial brain implants refers to computerised devices that are designed to be inserted into the human brain.

Avatars are animated graphical icons used to represent real people in **cyberspace** (the combination of all the data on all the computer networks throughout the world, accessed using the Internet).

Robotics is the study of robot systems.

Barcodes are sequences of vertical parallel lines used to give items unique identification numbers.

Radio-frequency tags are badges attached to products that emit radio-frequency signals to provide information about the product.

Computerised (operated or controlled using a computer) versions of common household items, such as fridges and washing machines, are becoming available. These devices have touch-sensitive display screens and can be connected to the Internet to enable **email** (electronic mail) and **browsing** (moving from webpage to webpage using a Web browser program) using **Web protocols** (agreed standards for communicating using the Web) such as **WRAP** (web-ready appliance protocol). These devices can be operated by **remote control** (at a distance) and can communicate with each other through the house **ring main** (the common, main electrical supply circuit). **Computerised fridges** can use radio-frequency tags to keep track of the items in the fridge, suggest menus or provide a shopping list.

Wireless network systems connections using radio signals without network cables) are becoming more common. They are used to connect devices such as **PCs** (personal computers), **mobile phones** (wireless telephones), printers, cameras, credit card devices, headphones and **MP3 devices** (music players that use MPEG Audio Layer 3 — a Motion Picture Experts Group Standard for audio compression). They communicate using standard protocols such as Bluetooth or WirelessLAN.

EVAs (electronic virtual assistants) are also likely to become more common. These are 3D (three-dimensional) animated images that provide a humanlike **interface**

(connection that provides a means of communication) between a computer user and a computer system. They are used by **call centres** (organisations that promote and sell products using the telephone), advertisers, **ISPs** (organisations that provide Internet connections for a fee) and **e-commerce** (buying and selling goods and services on the Internet). They can be programmed to operate a **search engine** (a program designed to find information in a database according to data entered by the user). They search the **databases** (electronic filing systems that store data in records) using **artificial intelligence** (an area of computing concerned with developing computer programs that perform tasks that can normally only be done using human intelligence). EVAs are controlled by **Java applets** (small, self-contained programs written using the Java computer language).

Ananova is the world's first digital newsreader. It is a 3D computer-generated animated image that has been programmed to have human characteristics. It operates over the Internet to deliver the news and latest information to personal computers, mobile phones and televisions. Ananova converts the information to speech and uses **real-time** (the immediate processing of computer data) animated graphics.

An **avatars creation system** automatically creates a 3D model of a person that can be used to represent them on mobile **videophones** (phones with video screens) and on Internet services, such as **email** (electronic mail), **Internet chat** (real-time, online discussions) and Internet games. Anyone can have a personal avatar created by emailing their photograph and personal details to the system. Electronic games played on a **games console** (an electronic device used for playing computer games) in which an image of the user appears in the form of an avatar, could become a **killer application** (an application program that is particularly useful and popular, making a computer system very successful). The increased availability of **broadband systems** (communications systems with a high signal capacity) such as **ADSL** (asymmetric digital subscriber line) are likely to allow avatars to be used to create a virtual world populated by virtual humans.

Robotic pets, such as robot dogs, and robotic creatures, such as robot lobsters and crickets, demonstrate that simple processes can result in complex behaviours. They

use **neural nets** (an artificial intelligence system that is capable of developing rules from given input so that it learns how to deal with more complex input). Experiments in **cybernetics** (the study of control and communication in animals and machines) may lead to more humans being turned into **cyborgs** (a man-machine system or a person made superhuman by a machine or external system that changes the way the body functions) in the future by having **chips** (common name for microchips — electronic integrated circuits in small packages) implanted in their bodies to act as **transponders** (devices that respond to received coded radio signals by automatically transmitting a different coded signal).

Human brains depend on **parallel processing** (the processing of different data at the same time) whereas computers process an input **serially** (one item at a time). Experiments with neural nets that have the capacity to form new links in the same way as the brain, are being used to simulate parallel processing. Robots controlled by computers with neural nets would be able to learn for themselves rather than depend on fixed programs.

Exercises

1. Explain the meaning of the words in bold.

2. Scan texts and give some information about new developments.

1. Licence to chill

Screenfridge is a fridge with built-in PC. When r.f. tags replace bar codes on groceries, Screenfridge will be able to read them to make menus, shopping lists and track 'use by' dates. Has a touch-sensitive screen linked to the Internet. Can be used as a message centre and be linked to a surveillance camera.

2. Talking to the washing

Ariston's new washing machine has a mobile phone link to the Internet. Can report faults. User can control remotely. Uses WRAP — Web-Ready Appliances Protocol — to communicate with other appliances through the ring main. Two problems: there are

rival systems to WRAP and high cost.

3. Dawn of the cyberbabes

EVAs can be used in call centres, e-commerce, etc. to give illusion of personal service cheaply. They can make gestures and imitate moods. EVAs utilise two features of website design: ability to make images look

3D and to search and retrieve information from data banks quickly.

EVAs are programmed with information such as product details and have a search engine to interpret customer queries. They can add answers to new questions to their database. They're run via a Java applet.

4. Ananova

Ananova is the first digital newsreader, delivering all kinds of news via the Internet 24 hrs a day. She's programmed with human characteristics based on the ideal newsreader. Incoming news is converted to speech and illustrated with animated graphics. Viewers can search for their favourite subjects. The director of one of the companies involved believes human newscasters will be replaced in this way. Others say we prefer real people we trust to bring us news.

5. The rise of the robots

Robot animals, e.g. Aibo, a robotobsteanrd, robot crickets have been developed. They use neural nets — linked processors which can be trained to recognise patterns in data. Developing links between man and computer is important, e.g. in restoring movement in paralysed people. Professor Warwick of Reading University has a chip in his arm which can control computers. He is going to fit a transponder which can be used to control his movements. He thinks such technology will change the way we work with machines, e.g. we'll be able to drive cars without steering wheels.

6. Can robots win the World Cup?

There is an annual robot football match. Each year the players have to be more skilled.

There will soon be a humanoid league for two-legged robots. BAAS run a two-a-side robot volleyball competition. of the key elements is getting robots to work together. Rush Robnett is working on swarming robots — cheap robots who together are more efficient than smarter individual robots. One expert predicts a robot team will beat the winner of the World Cup by the mid-21st century.

Електронне навчальне видання

Методичні рекомендації
до проведення практичних занять
із навчальної дисципліни

«ІНОЗЕМНА МОВА ЗА ПРОФЕСІЙНИМ СПРЯМУВАННЯМ»

Частина II

*(для здобувачів першого курсу денної форми навчання першого (бакалаврського)
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