



# INFORMATION COMMUNICATION TECHNOLOGY

TEACHER GUIDE

GRADE 11



Federal Democratic Republic of Ethiopia  
Ministry of Education

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# INFORMATION COMMUNICATION TECHNOLOGY

## TEACHER GUIDE

GRADE 11

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## INTRODUCTION TO THE TEACHER GUIDE

A perfect guide for an ICT teacher is one that provides support to the teacher to engage the students in joyful learning. Information and Communication Technologies (ICTs) refer to the possibilities offered by the convergence of data processing techniques, electronic media, and telecommunications, a convergence that has become evident over the past few years.

ICTs are grouped under two categories: *traditional* and *new*. Traditional ICTs are radio, television, and fixed line telephones etc., which have been gradually ingrained in the daily habits and lives of people and communities. New ICTs consist of computers and specific data processing applications accessible through those computers (e-mail, Internet, Word processing, and other data processing applications).

New ICTs are now found on the development agenda of African countries like Ethiopia, and strategies have been gradually implemented to integrate them into the development process. Many countries have initiated significant reforms in the telecommunications sector: privatizing companies, liberalizing and ending national monopolies in this sector.

This Teacher Guide will help the teachers to:

- explain how Information and Communication Technology (ICT) has the potential to make a real improvement to teaching and learning in schools.
- demonstrate a wide variety of ways in which ICT can be used to enhance learning, offering a fresh burst of inspiration for them i.e., the busy school teachers.
- take a structured approach, ensuring that the students can be guided progressively through all the contents in order to achieve the required standards for achieving Qualified Teacher Status, and also to continue their development in ICT to an advanced level.
- analyze all the common ICT tools and explain how they can exploit these tools for effective learning.
- explore how students can learn with ICT, how their skills develop, and how these skills can aid their learning.
- provide a framework for planning, analyzing and evaluating teaching with ICT.
- use Internet, educational trips and other aids to support class room teaching.
- prepare additional activities and assessments for the students.
- offer a range of innovative tasks, resources and methods of assessment.
- use key ideas, skills and techniques of ICT in other curriculum areas.

The guide also provides websites that have additional content for the teacher.

## UNIT OUTCOME

### Students will be able to:

- know the application of ICT in different sectors;
- understand the components of an Information System;
- recognise the application of ICT in different sectors;
- recognise how ICT can change the life of people.

## SUGGESTED LESSON PLAN

Sub-units	Number of Periods
1.1 General Concepts of Information Systems	3
1.2 Types of Information System in the Organization	8
1.3 Impact of ICT in Everyday Life	4

## STRUCTURE OF THE UNIT

### 1.1 General Concepts of Information Systems

In this sub-unit, we will learn about general concepts of Information Systems. The topic to be learnt is:

- Some applications of ICT at Home, Office, Factory, Transport, Communications, Education/ Training and Health.

### 1.2 Types of Information System in the Organization

In this sub-unit, we will learn about types of Information System in the organization. The topics to be learnt are:

- Definition of system and characteristics

- Application of Information System types
  - Transactional Information System
  - Management Information System
  - Decision Support System
  - Executive Information System
  - Office Automation Information System

### 1.3 Impact of ICT in Everyday Life

In this sub-unit, we will learn about impact of ICT in everyday life. The topics to be learnt are:

- Define a digital device
- Impact of using computers in offices
- Impact of mobile phones
- Impact of satellite broadcasting
- Differences between information poor and information rich society

## REVIEW OF THE UNIT

- A system is a set of related parts that operate together to perform a specific function.
- Information systems have not yet gotten to the point where they can think, plan, and react to changing circumstances. So, people work on information systems.

- The vast majority of end-users use computers in their own fields of interest.
- Some applications of ICT are at Home, Office, Factory, Transport, Communications, Education/ Training and Health.
- Information system is a system that provides information to people in an organization.
- A system is an interrelated set of components with an identifiable boundary working together for some purpose.
- The major characteristics of a system are: Components, Interrelated components, A boundary, A purpose, An environment, Interface, Input, Output and Constraints.
- The types of information systems are: Transaction Processing System, Management Information System, Decision Support System, Executive Information System and Office Automation System.
- ICT enables rapid access to ideas and experiences from a wide range of people, communities and cultures, and allows pupils to collaborate and exchange information on a wide scale.
- A digital device is a device that works with discrete numbers or digits.
- Computer has brought many changes in employment, including changes to office equipment, office location, work schedules and the types of work people are seeking.

- Mobile phones are the easiest and the simplest of the methods to stay connected with others, and moreover they provide a sense of security.
- Satellite technology plays an important role in communication globally.
- The Information Age/Digital Divide separate the information rich and the information poor.

### ROLE OF THE STUDENTS

In this unit, the students are supposed to learn Information Systems. The activity based method should be followed to understand the subject matter which is the best way of better understanding of the subject matter. At present students have better ways of learning ICT.

- The way in which students learn has changed, and that sitting in a passive mode in large lecture halls is not the expectation.
- Due to advancement in technology, today's students are different than those for whom the educational system was initially designed for because students "think and process information fundamentally differently from their predecessors" having grown up around computers, video games, and the Internet.
- They represent a generation which is completely surrounded by ICT where e-mail, instant messaging, and cell phones are integral parts of their lives.

### ADDITIONAL CLASS ACTIVITIES FOR GIFTED STUDENTS OR SLOW LEARNERS

#### ACTIVITY 1.1: Information Systems in an Enterprise

Students in their class will explain and discuss Information Systems in an Enterprise with the help of flow diagrams (see Fig. 1.1).

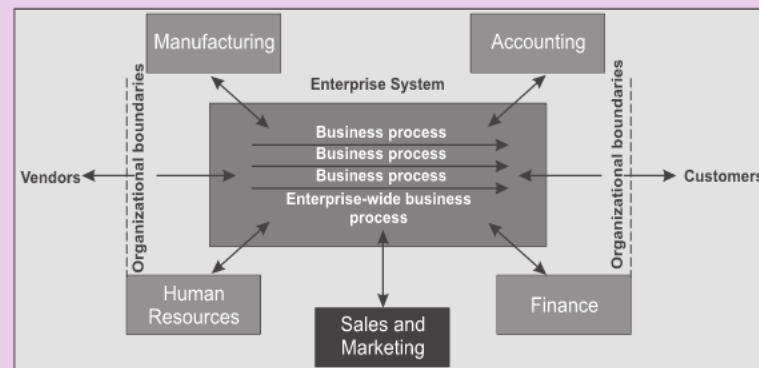


Fig. 1.1: Systems for an enterprise

**Business Processes**

- Manner in which work is organized, coordinated, and focused to produce a valuable product or service.
- Concrete work flows of material, information, and knowledge—sets of activities.
- Unique ways to coordinate work, information, and knowledge.
- Ways in which management chooses to coordinate work.

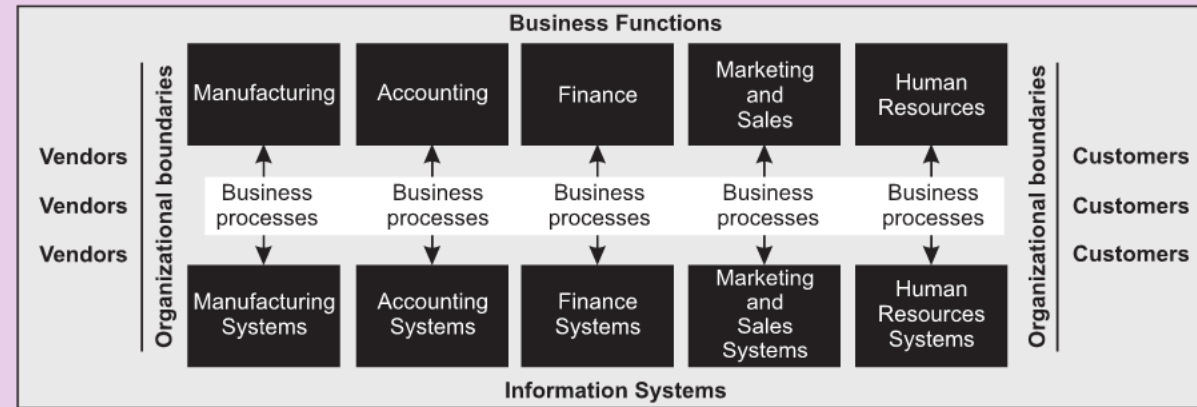


Fig. 1.2: Traditional View of the Systems






**ACTIVITY 1.2: Common ICT Applications**

Students in their class will explain and discuss common ICT applications.

‘ICT application’ is a technical term for a standard computer program. Common ICT applications are Wordprocessors, Desktop Publishing (DTP) software, Spreadsheets, Databases and Presentation software.

Students and teachers can make great use of standard ICT applications in their work. Students can develop their ICT skills by studying these applications.

These days many schools make use of Microsoft Office with a standard set of applications that can be used by all to develop their ICT skills:

	Microsoft Word	Wordprocessor
	Microsoft Publisher	DTP software
	Microsoft Excel	Spreadsheet
	Microsoft Access	Database
	Microsoft PowerPoint	Presentation software

**ACTIVITY 1.3: The Impact of ICT on Society**

Students in their class will explain and discuss the impacts of ICT on society.

Some impacts of ICT on society are given below:

**1. Faster Communication Speed**

- In the past, it took a long time for any news or messages to be sent. Now with the Internet, news or messages are sent via e-mail to friends, business partner or anyone efficiently.



- With the capability of bandwidth, broadband and connection speed on the Internet, any information can travel fast at an instant. It saves time and is inexpensive.

## 2. Lower Communication Cost

- Using the Internet is cost-effective than the other mode of communication such as telephone, mailing or courier service. It allows people to have access to large amounts of data at a very low cost.
- With the Internet we do not have to pay for any basic services provided by the Internet. Furthermore, the cost of connection to the Internet is relatively cheap.

## 3. Paperless Environment

ICT technology has created the term paperless environment. This term means information can be stored and retrieved through the digital medium instead of paper. Online communication via e-mail, online chat and instant messages also helps in creating the paperless environment.

## 4. Effective Sharing of Information

People can share and exchange opinions, news and information through discussion groups, mailing list and forums on the Internet. This enables knowledge sharing which will contribute to the development of a knowledge based society.

## 5. Social Problems

- There are some negative effects of ICT.
- Now-a-days, people tend to choose online communication rather than having real time conversations.
- People tend to become more individualistic and introvert. Theft, hacking, pornography and online gambling are some evils spread by ICT. This will result in moral decadence and generate threat to the society.

## 6. Health Problems

- A computer may harm the user if they use it for long hours frequently.
- Computer users are also exposed to bad posture, eyestrain, physical and mental stress.
- In order to solve the health problems, an ergonomic chair can reduce back strain and a screen filter can minimize eyestrain.

## ANSWERS TO TEXTBOOK ASSESSMENTS

### Assessment 1.1

#### Fill in the Blanks

1. Information
2. applications
3. Endoscopy
4. offices

#### State Whether True or False

1. False
2. True
3. False
4. True
5. True

#### Answer the Following

1. ICT has a large number of applications in different sectors of life. Some applications of ICT are described below:

#### Home

When your computer is connected to a CD-ROM drive, encyclopaedic information, movies and animations are instantly available. When your computer is connected to the phone line, you can visit your community or other parts of the world. The lines between work, play and education are beginning to disappear as ICT resources once available only at work or school become available at the home.

Using the World Wide Web at your home you can research school or work assignments, exchange e-mail, join special interest groups, download files, play games, or make airline reservations.

Sales catalogues are now being computerized and many catalogues are even put on the web so you can do online shopping. With an Internet connection, you can read the newspaper. You can get study material on CD-ROM discs or over the Internet. Home shopping and banking are growing areas of ICT. There are sites through which one can search for new friends while sitting at home. You can make your travel plans, check weather or chat with your friends over the Internet, without moving out of your home.

#### **Office**

ICTs are everywhere and offices are using them in newer ways, unthought of even a decade ago. You could list thousands of these modern uses.

Without computers, the modern offices would almost instantly grind to a halt. Computers have become so deeply embedded in information processing and communications systems that almost no activity would be possible without them. Failure of the telecom and electrical company's computers would shut off those services.

The ICTs are integrated into offices in the following ways:

- (i) Transaction processing
- (ii) Home-based workers
- (iii) Desktop publishing
- (iv) Financial analysis
- (v) Product design
- (vi) Architectural walk-through
- (vii) Factories etc.

#### **Factory**

ICTs have a major impact in industries where products are designed and manufactured. Computer-Aided Design (CAD) is used to design and develop products. Computer-Aided Manufacturing (CAM) is used to manufacture them.

Factory floors are becoming increasingly populated by computers used for many purposes including inventory control and planning and process control.

Computers are also used to run robots that create, finish, assemble and test products and their components.

#### **Transport**

In the transport sector, ICT applications are used to improve road, air and rail transportation. ICT applications are noticeable in air traffic control, monitoring of freight and the day-to-day transport system. For example, we can book air tickets or railway tickets online. Pilots are trained on software, which simulates flying.

The air traffic control and rail signals are also among ICT applications.

#### **Communications**

This has been one of the most recognised uses of the ICTs. Various communication technologies, ranging from broadcasting to telecommunications and to the Internet are playing effective roles in the acquisition and sharing of information. Almost all mobile phones have software embedded in them.

The concepts of the 'information revolution' and 'information society' are driven by enormous advancements in ICTs and their application. The Internet for example, has provided platforms for sharing information in applications such as the e-mail and the World Wide Web.

Satellites are commonly used in ICTs. They may simply relay signals from one point to another, eliminating the need for wires between two locations. They also broadcast TV and even Internet signals that can be picked up even by small dish antennas.

#### **Education/Training**

The education sector is arguably one major area in which ICTs are playing a remarkable role. Computers are serving as the best friend to both the teacher and the students. You can find a computer in a classroom, in a library or in a museum. The ability to connect computers and students together over a network such as the Internet opens up fantastic educational opportunities.

In schools computers are increasingly being used to teach ICT courses like the ones you are taking. For example, this text has ICT application integrated into it. An e-learning software supplements the knowledge you get by studying books.

Elementary and secondary schools are using computers to play multimedia educational

programs and to teach kids to explore the web for information. We can give online examination and get instant results. We can check our examination results online.

Ministry of Education, Ethiopia is soon going to launch a series of educational programs that will be broadcast on TV channels. In Ethiopia, various universities are developing online certification courses for those people who do not have time or resources to take regular classes. Thus, various ICT tools help in providing education and becoming more knowledgeable as well as more qualified.

Museums use interactive multimedia to educate visitors on topics from science to fine art. Increasingly, these exhibits are being put on the web so you can visit them on your own. ICTs are especially valuable for students with special needs. A computer's voice recognition capabilities and its connection to the Internet makes it possible for special education users to participate in learning experiences from which they may have previously been excluded. For example, the Short Message Service (SMS) can be used to send and receive messages by the hearing impaired, the voice activated dialing service can be used by visually impaired.

Training programs in business and various organizations are huge and expensive. To save money and improve performance, companies are using Computer-Based Training (CBT) to train people on procedures and techniques they need to know in their jobs. Training programs in organizations rely heavily on ICT sectors such as video conferencing. Virtual reality is now used to train pilots by putting them into a cockpit simulator where they can experience the sensations associated with various maneuvers as they learn to handle them.

### Health

ICTs are widely used in the field of medicine. They support efficient exchange of information between health professionals, they enable transfer of patient records between sites and they can improve clinical effectiveness, continuity and quality of care by health professionals. Physicians use ICT to understand the human body and to diagnose disorders.

Several computer controlled machines are being used in modern hospitals. The computer

controlled laser machines are used in surgery. The complex surgeries can be performed by smallest possible cuts on the patient's body. This is done by operating through a technique, called *Endoscopy*. This involves the use of computers, small cameras and other devices for operating upon the patient.

The ICTs are also helpful in training doctors for surgery. The surgeries can be performed on computer controlled models or by using virtual reality techniques. These models simulate a real life environment by using computers to perform a particular task.

### Suggested Activities

Refer to sub-unit 1.1 of the Student Textbook for doing the activities.

### Assessment 1.2

#### Fill in the Blanks

1. Information System
2. components
3. Management Information System (MIS)
4. Decision Support System (DSS)
5. Executive Support System (ESS)

#### State Whether True or False

1. False
2. True
3. True
4. True
5. False

#### Answer the Following

1. The definition of system and its characteristics are given below:

A **system** is an interrelated set of components with an identifiable boundary working together for some purpose. A system has nine characteristics as shown in Fig. 1.3:

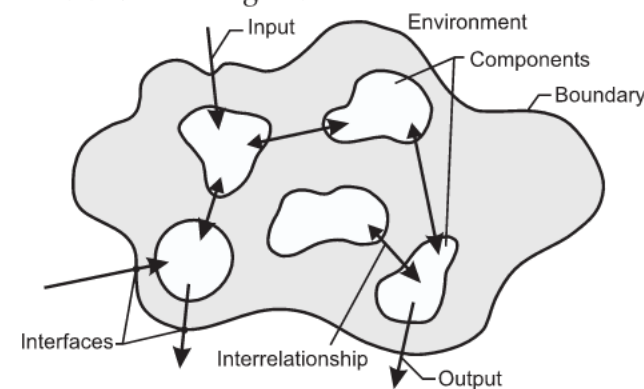


Fig. 1.3: A general illustration of a system



The system characteristics are discussed below:

- (i) *Components*: A system is made up of components. A component is either an irreducible part or an aggregate of parts, also known as a subsystem. The simple concept of a component is very powerful. For example, just as with an automobile or a stereo system with proper design, we can repair or upgrade a system by changing individual components without having to make changes throughout the entire system.
  - (ii) *Interrelated components*: The components are interrelated, that is, the function of one component is somehow tied to the functions of the other components. For example, the work of one component, such as producing a daily report of customer orders received, may not progress successfully until the work of another component is finished, such as sorting customer orders by date of their receipt.
  - (iii) *A boundary*: A system has a boundary within which all of its components are contained and that establishes the limits of a system, separating the system from other systems. Components within the boundary of a system can be changed, whereas things outside the boundary cannot be changed.
  - (iv) *A purpose*: All of the components work together to achieve some overall purpose for the larger system: the system's main reason for existing.
  - (v) *An environment*: A system exists within an environment which comprises of everything outside the system's boundary. For example, we might consider the environment of a state university to include the legislature, prospective students, foundations and funding agencies and the news media. Usually the system interacts with its environment, exchanging, in the case of an information system, data and information.
  - (vi) *Interfaces*: The points at which the system meets its environment are known as interfaces, and there are also interfaces between subsystems. An example of subsystem interface is the clutch subsystem, which acts as the point of interaction between the engine and transmission subsystems of a car.
- (vii) *Input*: A system takes input from its environment in order to function. Mammals, for example, take in food, oxygen and water from the environment as input. A system cannot function properly if inputs are inaccurate or faulty.
  - (viii) *Output*: Finally, a system returns output to its environment as a result to its functioning and thus achieves its purpose.
  - (ix) *Constraints*: A system must face constraints in its functioning because there are limits (in terms of capacity, speed, or capabilities) to what it can do and how it can achieve its purpose within its environment. Some of these constraints are imposed inside the system (e.g., a limited number of staff available), whereas others are imposed by the environment (e.g., due dates or regulations imposed by government or some other agency).
2. The definition of each type of Information System is given below:
- *Transaction Processing System*: A Transaction Processing System (TPS) is a computer-based information system that keeps track of the transactions needed to conduct business.
  - *Management Information System*: A Management Information System (MIS) is a computer-based information system that uses data recorded by TPS as input into programs that produce routine reports as output.
  - *Decision Support System*: A Decision Support System (DSS) is a computer-based information system that provides a flexible tool for analysis and helps managers focus on the future.
  - *Executive Support System*: An Executive Support System (ESS) is an easy-to-use DSS made especially for top managers; it specifically supports strategic decision making. An ESS is also known as Executive Information System (EIS).
  - *Office Automation System*: Office Automation System (OAS) combines various technologies



to reduce the manual labour required in operating an efficient office environment.

3. The application of each type of Information system is given below:

- *Transaction Processing System:* Transaction Processing Systems (TPSs) are designed to process routine transactions efficiently and accurately. A business will have several (sometimes many) TPS; for example:
  - Billing systems to send invoices to customers
  - Systems to calculate the weekly and monthly payroll and tax payments
  - Production and purchasing systems to calculate raw material requirements
  - Stock control systems to process all movements into, within and out of the business.
- *Management Information System:* A Management Information System (MIS) is mainly concerned with internal sources of information. MIS usually takes data from the transaction processing systems and summarizes it into a series of management reports. MIS reports tend to be used by middle management and operational supervisors.
- *Decision-Support Systems:* Decision-Support Systems (DSSs) are specifically designed to help management make decisions in situations where there is uncertainty about the possible outcomes of those decisions. DSS comprises tools and techniques to help gather relevant information and analyze the options and alternatives. DSS often involves use of complex spreadsheets and databases to create “what-if” models.
- *Executive Support System:* An Executive Support System (ESS) is designed to help senior management make strategic decisions. It gathers, analyses and summarizes the key internal and external information used in the business.  
A good way to think about an ESS is to imagine the senior management team in an aircraft cockpit – with the instrument panel

showing them the status of all the key business activities. ESS typically involves lots of data analysis and modeling tools such as “what-if” analysis to help strategic decision-making.

- *Office Automation Systems:* Office Automation Systems (OASs) are systems that try to improve the productivity of employees who need to process data and information. Perhaps the best example is the wide range of software systems that exist to improve the productivity of employees working in an office (e.g., Microsoft Office XP) or systems that allow employees to work from home or whilst on the move.

#### Suggested Activities

Refer to sub-unit 1.2 of the Student Textbook for doing the activities.

#### ANSWERS TO REVIEW QUESTIONS

##### Fill in the Blanks

1. ICT
2. Satellite
3. information rich society

##### State Whether True or False

1. False
2. True
3. True
4. False

##### Multiple Choice Questions

1. (a)
2. (d)
3. (b)
4. (c)

##### Match the Following

1. (c)
2. (d)
3. (b)
4. (a)

##### Answer the Following

1. The increasing use of technology in all aspects of society makes confident, creative and productive use of ICT an essential skill for life. ICT can be used to find, develop, analyse and present information, as well as to model situations and solve problems. ICT enables rapid access to ideas and experiences from a wide range of people, communities and cultures, and allows pupils to collaborate and exchange information on a wide scale.

ICT acts as a powerful force for change in society and citizens should have an understanding of the social, ethical, legal and economic implications of its use, including how to use ICT safely and responsibly. Increased capability in the use of ICT supports initiative and independent learning, as pupils are able to make informed judgements about when and where to use ICT to enhance their learning and the quality of their work.

In everyday life computers, mobile phones and satellite broadcasting are very useful to all of us.

2. *Digital device:* It is a device that works with discrete numbers or digits. For example, Digital Computers, Digital Cameras, MP3 players, Mobile Chargers, Cell Phones, PDA, GSP portables, Mobile VoIP etc.

*Impact of using computers in offices:* Computers are forever present in the offices. Computers are helpful because they offer a wide range of functions and services that are not available anywhere else. There are four main uses—word processing, Internet/communications, digital video/audio composition, and desktop publishing. Although one can create a typed paper with a typewriter, the computer has more features to do it with. Internet and communications, digital video and audio composition, and desktop publishing are all features that are only offered on computers. Electronic mail has made it easy to send messages worldwide via computer communication networks. With these tools human society has progressed exponentially.

Office automation has become the term for linking workstations, printers, database systems, and other tools by means of a local-area network. An eventual goal of office automation has been termed the *paperless office*. The increasing educational opportunities from the use of computers in turn increase the professional job opportunities in offices.

3. Use of the Internet and other digital technologies has become a necessary tool to function in today's society. Digital divide is the gap that separates

those who have access to technology and the Internet and those who do not.

Some of the differences between information poor and information rich society are given below:

<i>Information Poor Society</i>	<i>Information Rich Society</i>
1. Has lower income and education level.	1. Has higher income and education level.
2. Has no access to information, e.g., Internet.	2. Has good access to information, e.g., Internet.
3. Majority of people are in developing countries.	3. Majority of people are in developed countries.
4. Cannot use ICT applications.	4. Can use ICT applications.
5. Do not know that ICT can help alleviate poverty.	5. Know that ICT can help alleviate poverty.

#### **Suggested Activity**

Refer to sub-unit 1.3 of the Student Textbook for doing the activity.

#### **ALTERNATIVE TEACHING APPROACHES**

The ICT teachers can use Internet, charts, worksheets, models, go for educational field trips and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning about "Information Systems".

#### **ADDITIONAL QUESTIONS**

1. Describe applications of ICT in Business, Arts, Science, Engineering, Mathematics and Global Positioning System (GPS).
2. List the information systems. What commercial project management software are suitable for information system projects? What are their key features?
3. Describe the utility of ICT in everyday life.
4. Is the gap between Information poor and information rich society increasing? Discuss.

# UNIT 2

# ENHANCING THE USE OF SOFTWARE

(24 PERIODS)

## UNIT OUTCOME

### Students will be able to:

- recognise to choose appropriate software tools to solve problems, illustrate ideas, and clarify thinking in the other subjects chosen for study in Grade 11.

## SUGGESTED LESSON PLAN

Sub-unit	Number of Periods
2.1 Using Application Software	24

## STRUCTURE OF THE UNIT

### 2.1 Using Application Software

In this sub-unit, we will learn about Using Application Software. The topics to be learnt are:

- Word processing,
  - Overview
  - Section breaks
  - Mail merge
  - Header & Footer
- Presentation Software
  - Overview
- Spreadsheets,
  - Overview
  - IF condition with AND or OR
- Publishing Software
  - Overview
- Database Management
  - Overview

- Main/Sub reports
- Group section

## REVIEW OF THE UNIT

- Word processing program such as MS-Word 2007 can support photos and drawings, mathematical calculations, text in table format, text in varying sizes, shapes, colors and even sound bites.
- Mail merge is used to create a set of documents, such as birthday invitation that is sent to many friends and relatives or a sheet of address labels.
- Presentation software such as MS-PowerPoint 2007 allows users to create slide shows that can be viewed on the computer or projected onto a large screen.
- Spreadsheet software such as MS-Excel 2007 can be used for both simple and complex calculations.
- Desktop publishing software such as MS-Publisher 2007 is designed specifically to handle various desktop publishing needs of individuals and small organization.
- Database software such as MS-Access 2007 is designed to keep track of information.

## ROLE OF THE STUDENTS

In this unit, the students are supposed to enhance the use of software. The activity based method should



be followed to understand the subject matter which is the best way of better understanding of the subject matter.

Different type of technologies can be used by the students to enhance the use of software. Various technologies deliver different kinds of content and

serve different purposes in the classroom. For example, word processing promotes communication skills and presentation software promotes presentation skills of students. So, it is important for the students to solve problems by specific software, illustrate their ideas, organize their contents and test their hypotheses.

## ADDITIONAL CLASS ACTIVITIES FOR GIFTED STUDENTS OR SLOW LEARNERS

### ACTIVITY 2.1: Testing the Word Processing Knowledge

Students will answer some Word processing questions to test their knowledge.

Answer the following questions:

<b>Question 1.</b>	What is the name of your word processing program?
<b>Question 2.</b>	What version of the program are you using?
<b>Question 3.</b>	Are there different ways of opening your word processing program? What are they?
<b>Question 4.</b>	How did you get help on how to use the program? (consider computer, paper-based and 'people' resources)
<b>Question 5.</b>	How do you use the <i>Help</i> function?
<b>Question 6.</b>	Does the <i>Help</i> function provide a list of keyboard shortcuts and mouse functions?
<b>Question 7.</b>	How will you exit from the program?



When you have completed this worksheet, attach it to an e-mail message with the subject line 'Word Processing Activity 2.1 Answers' and send it to your online teacher.

**ACTIVITY 2.2: Testing the Spreadsheet Knowledge**

Students will use the words given below to fill in the missing words in the following paragraph.

columns	Sorted	formatting	cell	Rows
text	formulas	numbers	what-if	budgets
timetables	numerical	headings	managing	A1

Spreadsheets are used for many purposes: \_\_\_\_\_, \_\_\_\_\_, calculation of \_\_\_\_\_ data and \_\_\_\_\_ lists of information. Both \_\_\_\_\_ and \_\_\_\_\_ can be entered into a spreadsheet. \_\_\_\_\_ are horizontal and \_\_\_\_\_ are vertical. A \_\_\_\_\_ is the intersection between a row and a column. \_\_\_\_\_ is an example of a cell reference. \_\_\_\_\_ can be used to calculate values. This makes them useful when manipulating data. Text can be used to make \_\_\_\_\_. \_\_\_\_\_ can make these headings stand out on a page of numbers. Lists of information can be stored in spreadsheets. This has the benefit of being easily \_\_\_\_\_. Once a worksheet has been created, the power and versatility of spreadsheet is to put by performing \_\_\_\_\_ analyses.



When you have completed this worksheet, attach it to an e-mail message with the subject line 'Spreadsheet Activity 2.2 Answers' and send it to your online teacher.

**ANSWERS TO REVIEW QUESTIONS****Fill in the Blanks**

1. Application Software
2. mail merge
3. Desktop publishing
4. database

**State Whether True or False**

1. True
2. False
3. True
4. True

**Multiple Choice Questions**

1. (a)
2. (c)
3. (c)
4. (d)

**Match the Following**

1. (c)
2. (d)
3. (e)
4. (a)
5. (b)

**Answer the Following**

1. *Word Processing*: It refers to the act of processing the textual information including typing, editing, formatting and printing.

*Mail merge in Word 2007*: Mail merge is used when we want to create a set of documents, such

as a form letter that is sent to many customers or a sheet of address labels. Each letter or label has the same kind of information, yet the content is unique. For example, in letters to our friends, each letter can be personalized to address each friend by name. The unique information in each letter or label comes from entries in a data source.

The mail merge steps are:

- (i) *Set up the main document*. The main document contains the text and graphics that are the same for each version of the merged document. For example, the return address or salutation in a form letter.
- (ii) *Connect the document to a data source*. A data source is a file that contains the information to be merged into a document. For example, the names and addresses of the recipients of a letter.
- (iii) *Refine the list of recipients or items*. MS-Word generates a copy of the main document for each item, or record, in our data file. If our data file is a mailing list, these items are probably recipients of our mailing. If we want to generate copies for only certain items in our

data file, we can choose which items (records) to include.

- (iv) *Add placeholders, called mail merge fields, to the document.* When we perform the mail merge, the mail merge fields are filled with information from our data file.
- (v) *Preview and complete the merge.* We can preview each copy of the document before we print the whole set.

In Word 2007, we use commands on the *Mailings* tab to perform a mail merge. We can also perform a mail merge by using the *Mail Merge* task pane, which leads us step by step through the process. To use the task pane, in the *Start Mail Merge* group on the *Mailings* tab, click *Start Mail Merge*, and then click *Step by Step Mail Merge Wizard*.

2. *To insert an image or clipart in a presentation, perform the following steps:*

- (i) Open a presentation.
- (ii) Click the slide on which you want to insert the image or clipart.
- (iii) Click *Insert* tab.
- (iv) Click *Picture* button or *Clip Art* button.
- (v) At *Insert Picture* dialog box, navigate to desired folder or at *Clip Art* task pane, type desired category, and then press *Enter* key.
- (vi) Double-click the desired picture file or clip art image. Arrange the picture or clip art in the slide and resize it if necessary.
- (vii) Save the presentation.

3. *Spreadsheet:* It is an application software that is designed to handle large volumes of business and general data. It can be used for calculating accounts, managing inventory, managing payroll, managing and analyzing the sales and marketing, and managing household data like recording expenditures.

*If condition with AND or OR in Excel 2007:* We can use the AND or OR to create conditional formulas.

**AND( ):** It returns TRUE if all its arguments are TRUE; returns FALSE if one or more argument is FALSE. The syntax of AND( ) function is:  
AND(logical1, logical2, ...)

Here,

logical1, logical2, ... are 1 to 255 conditions you want to test that can be either TRUE or FALSE.

For example,

=AND(TRUE,TRUE) will result TRUE.

=AND(TRUE,FALSE) will result FALSE.

=AND(3+4=7,3+5=8) will result TRUE.

**OR( ):** It returns TRUE if any argument is TRUE; returns FALSE if all arguments are FALSE. The syntax of OR( ) function is:

OR(logical1, logical2,...)

Here,

logical1, logical2,... are 1 to 255 conditions you want to test that can be either TRUE or FALSE.

For example,

=OR(TRUE) will result TRUE.

=OR(FALSE,FALSE) will result FALSE.

=OR(3+4=8,3+5=9) will result FALSE.

4. MS-Publisher 2007 can create a wide range of publications. The names of some of these publications are:

- (i) Advertisements
- (ii) Banners
- (iii) Brochures
- (iv) Business Cards
- (v) Calendars
- (vi) Catalogs
- (vii) Flyers
- (viii) Greeting Cards
- (ix) Invitation Cards
- (x) Resumes
- (xi) Websites etc.

*To create and save a publication based on a template, perform the following steps:*

- (i) Choose a publication type from *Publication Types* in the left pane of the *Getting Started with Microsoft Office Publisher 2007* window.
- (ii) In the *Publication Types* list, click the publication category you want.
- (iii) In the right pane, set the publication options and then click *Create*.



A publication based on the selected template opens in a new Publisher program window.

The Publisher program window displays all the tools you need to customize the publication. You can perform most tasks by clicking commands on menus or buttons on toolbars. Common tasks are available in the *Format Publication* task pane to left of the publication workspace.

- (iv) To save a publication, click *Save As* on the *File* menu.
- (v) Click the *New Folder* button on the toolbar of the *Save As* dialog box.
- (vi) Type a name for the folder, press *Enter* key and name the file if necessary.
- (vii) Click *Save*.

5. *Main/subreport in Access 2007*: A subreport is a report that is inserted in another report. When we combine reports, one of them must serve as the main report that contains the other report. A main report is either *bound* or *unbound*. A bound report is one that can display data and has a table or query specified in its *Record Source* property. An unbound report is one that is not based on a table or query (that is, the *Record Source* property of the report is empty).

We can create a variety of reports in Access 2007, ranging from the simple to the complex. First of all choose the report's record source. Whether the report is a simple listing of records or a grouped summary of sales by region, we must first determine which fields contain the data we want to see in our report, and in which tables or queries they reside.

After we choose the record source, we can create the report by using the *Report Wizard*. The *Report Wizard* is a feature in *Access 2007* that guides us through a series of questions and then generates a report based on our answers.

To insert a subreport in a report, perform the following steps:

- (i) Open the main report in *Design view*. Then double-click the *Report Selector* to display the *Property sheet* pane.

- (ii) On the *Data* tab, click the *Record Source* arrow, and select the table or query on which the subreport will be based.
- (iii) On the *Design* contextual tab, in the *Controls group*, click the *Subform/Subreport* button, and then click a point on the main report. The *SubReport Wizard* appears.
- (iv) In the *SubReport* wizard, with the *Use existing Tables and Queries* option selected, click *Next*.
- (v) In the *Tables/Queries* list, click the source you want to use.
- (vi) In the *Available Fields* list, double-click the fields you want to move them to the *Selected Fields* list, and then click *Next*.
- (vii) Click *Next* and then click *Finish*. The subreport will be inserted in the report.
- (viii) Double-click on the subreport in the *Navigation Pane* to see its contents.
- (ix) Save the subreport.

#### Suggested Activities

Refer to sub-unit 2.1 of the Student Textbook for doing the activities.

#### ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL

The ICT teachers can use Internet, charts, worksheets, models, go for educational field trips and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning about “Enhancing the Use of Software”.

#### ADDITIONAL QUESTIONS

1. How will you solve problems by specific software? Discuss.
2. Describe some popular features of word processing and presentation software.
3. Compare and contrast spreadsheets and databases.
4. Explain the desktop publishing process and describe some of its main features.

# UNIT 3

# BASIC TROUBLESHOOTING

(18 PERIODS)

## UNIT OUTCOME

### Students will be able to:

- recognise basic idea in preventive maintenance
- apply the knowledge gained in preventive maintenance to prolong the life of the computer
- be aware of basic safety issues
- recognise major hardware components inside the computer
- acquire knowledge on how to format hard disk and install software.

## SUGGESTED LESSON PLAN

Sub-units	Number of Periods
3.1 Basics of Preventive Maintenance	6
3.2 Basic Safety Issues	6
3.3 Hardware Maintenance Basics	4
3.4 Installing and Uninstalling Applications Software	2

## STRUCTURE OF THE UNIT

### 3.1 Basics of Preventive Maintenance

In this sub-unit, we will learn about basics of preventive maintenance. The topics to be learnt are:

- Environment and location of a computer
- Electric power
- Back up methods
- Manual

- Using utility programs
- Improving hard disk performance
- Disk defragmenter
- Disk cleanup

### 3.2 Basic Safety Issues

In this sub-unit, we will learn about basic safety issues. The topics to be learnt are:

- Overview of safety measures
- Electro Static Discharge (ESD)
- Hidden ESD
- Catastrophic ESD
- Degradation
- Some common ESD protection devices
- Anti-static Wrist and Ankle Straps
- Anti-static Mats
- Setting up an Ergonomic Computer and Seating

### 3.3 Hardware Maintenance Basics

In this sub-unit, we will learn about hardware maintenance basics. The topics to be learnt are:

- Connecting basic input and output devices with the system units



- Checking dead system
- General steps to troubleshoot problems
- Troubleshooting common input and output devices

### 3.4 Installing and Uninstalling Applications Software

In this sub-unit, we will learn about basics of installing and uninstalling application software. The topics to be learnt are:

- Installing application software *e.g.*, Microsoft Office
- Uninstalling application software *e.g.*, Microsoft Office

#### REVIEW OF THE UNIT

- Computer is a very sensitive device and needs to be placed very carefully and its physical environment and location requires some special arrangements, protections and precautions.
- A backup utility is used to make a backup, or duplicate copy, of the information on the hard disk. Use defragmenter and disk cleanup to improve hard disk performances.
- Electro Static Discharge (ESD) is the release of static electricity when two objects come into

contact. The best method of preventing ESD is to use anti-static wrist and ankle straps, or use a grounding mat or table.

- Eyestrain usually arise because of improper lighting, screen glare, and long shifts staring at the screen.
- We must know how to plug properly input and output devices with a system and their troubleshooting.
- We must know how to install and uninstall application software.

#### ROLE OF THE STUDENTS

In this unit, the students are supposed to learn the basic troubleshooting. The activity-based method should be followed to understand the subject matter which is the best way of better understanding of the subject matter.

The students should learn about the computer troubleshooting tips, how to fix hardware errors, and how to fix the software errors. Troubleshooting the computer problems is very vital for students. Every hardware component in the computer system has its own configuration methods and troubleshooting techniques. The students use a computer at their home or in school. They must be aware of the diagnostic procedures and troubleshooting of the basic computer problems.

#### ADDITIONAL CLASS ACTIVITIES FOR GIFTED STUDENTS OR SLOW LEARNERS

##### ACTIVITY 3.1: Preventive Maintenance Procedures

In small groups, the students will practise as the teacher instructs about preventive maintenance procedures.

##### Preventive Maintenance Procedures

To prolong the life of your PC, you simply must inspect and clean it regularly. Cleaning your PC on a regular basis can prevent overheating and Electro Static Discharge (ESD).



Fig. 3.1: Maintenance of PC—prolongs its life

During the inspection process, look for damaged or cracked components, improperly seated components, frayed cables, and loose connections.

### **Cleaning Tools**

Many products are available to help improve the process of cleaning your computer and peripherals. You can also use household items to clean the computers and peripherals. Remember that some components in your computer may only be able to be cleaned using a product designed for cleaning that component. Some cleaning tools are cloth, water or rubbing alcohol, portable vacuum cleaner, cotton swabs, foam swabs etc.

You should use a cloth when cleaning components such as the outside of the case, a drive, mouse, etc. Do not use a cloth to clean any circuitry such as the RAM or motherboard since it can generate ESD that can damage electronic components.

### **Compressed Air**

Compressed air works well for getting the dust out of power supply fans, expansion slots, and keyboards, but you need to exercise care in using it for blowing the dust off components and the inside of the case. It is not uncommon to blow the dust off one component right onto another component.

You also need to exercise extreme care when using compressed air, because the liquid that compresses the air sits in the bottom of the can and is usually not released unless you turn the can upside down or sideways. This liquid can damage or destroy your components.

### **Liquid Cleaning Compounds**

Before using any liquid cleaning compound, make sure that your computer is turned off. If the PC has power when you use liquid cleaners, you run the risk of frying or shorting out your components, which is an expensive risk to take. Also make sure that the component you have cleaned with a liquid cleaner is thoroughly dry before turning your computer back on!

### **Clean or Soapy Water and a Damp Cloth**

In some cases, you need only a bit of water and a damp cloth for cleaning chores, such as when cleaning the mouse ball, the outside of the mouse, or the exterior of the monitor or computer case. If water alone cannot do the job thoroughly, you can use mild soapy water on your damp cloth. Make sure that the cloth is damp and not wet and that you do not splash or drip water into your components.

If the keys on your keyboard start to stick or you have spilled a cup of coffee into your keyboard, or, for that matter, you just know that there is a lot of dirt under the keys; you can clean the keyboard with distilled water. Some techs will use a light silicone spray lubricant, but I find that water does as good a job. Keep in mind that if you want your keyboard to work again, you need to make sure that it's unplugged before you clean it and that it is thoroughly dry before you plug it in again. As a general rule, wait at least 48 hours before re-attaching the keyboard to your system.

### **Glass Cleaner**

You need to turn your monitor off before cleaning to avoid damage to the screen. Many technicians clean the monitor screen with regular cleaner. Under most circumstances, however, water and a damp cloth will do the job just fine. Water is the safest cleaning liquid you can use on a monitor. When cleaning the LCD display screen of a laptop, do not use glass cleaner at all. You will melt the screen!

### **Lint-Free Cloths**

Lint-free cloths are excellent for removing dust from your computer. The cloths used for cleaning eyeglasses work the best, because they will not scratch the surfaces or leave lint behind.

**ACTIVITY 3.2: Disk Defragmentation**

In small groups, students will explain and demonstrate about disk defragmentation.

**Disk Defragmentation Utility Software**

When computer system finds a file too large to store in a single location, it splits the file and stores it in pieces (called fragments), which are logically linked. This simply means that different parts of the file are scattered across the hard drive in non-contiguous locations. This type of fragmented file requires some extra time to access and slows down the system. Disk defragmentation utility software speeds up the system by rearranging such fragmented files stored on a disk in contiguous location in order to optimize the system performance. For example, if you have three defragmented files named 1 (stored in 6 fragments), 2 (stored in 4 fragments) and 3 (stored in 5 fragments) as shown in Fig. 3.2, then running the defragmentation utility will reorganize the file contents in consecutive locations as shown in Fig. 3.2.

1	1	1	2	2
3	3	1	2	Free
Free	Free	2	2	Free
3	3	3	Free	1

Example of a Fragmented Drive

1	1	1	1	1
1	2	2	2	2
3	3	3	3	3
Free	Free	Free	Free	Free

Example of a Defragmented Drive

**Fig. 3.2: A simple Visualization of Disk Fragmentation**

You should regularly get defragmented your hard drive so as to increase the speed of accessing files thereby improving the system performance.

**ANSWERS TO REVIEW QUESTIONS****Fill in the Blanks**

- Computer
- Electro Static Discharge (ESD)
- input, output
- Ergonomics

**State Whether True or False**

- False
- True
- True
- False

**Multiple Choice Questions**

- (d)
- (a)
- (d)
- (b)

**Match the Following**

- (c)
- (a)
- (d)
- (b)

**Answer the Following**

- Computer is a very sensitive device and needs to be placed very carefully. Its physical environment and location requires some special arrangements, protections and precautions. These precautions and protections are not only necessary for computers but are equally important for computer users.

In order to ensure troublefree, prolonged life and smooth working of a computer, you must take into consideration that dust-free environment and proper location are maintained for it. You must take care of the following:

- Always place your computer in an open area that allows adequate airflow.
- Keep the computer in a cool, dry and dust-free environment.



- (iii) Keep level, stable floors and tables.
- (iv) Arrange ergonomic furniture.
- (v) Keep precautionary fire prevention equipment.
- (vi) Must have static electricity.
- (vii) Keep the computer safe from vibrations.

For setting up an ergonomic computer, you must take care of the following:

- (i) Guarding against hardware theft and loss.
- (ii) Guarding against heat, cold, spills and drops.
- (iii) Guarding against damage to software.
- (iv) Protecting the data.

More important than any computer system and (probably) any data is computer user's health. The most serious effects are painful hand and wrist injuries, eyestrain and headache, and back and neck pains. You can avoid most of these problems, if not all, by sitting properly.

Eyestrain usually arises because of improper lighting, screen glare, and long shifts staring at the screen. Make sure that the windows and lights do not throw a glare on the screen and that the computer is not framed by an uncovered window.

2. Computers need electric power to work, but it can harm a PC or its data if it does not flow properly. The electricity available from a standard wall outlet is Alternating Current (AC), but a PC runs on Direct Current (DC). The power supply is a device that converts AC to DC to run the computer. The on/off switch in your computer turns on or shuts off the electricity to the power supply.

Your computer needs good power to run properly, but various factors can take what should be a steady stream of electricity from the wall socket and turn it into a trickle or a fire hose. It is important that you know how to protect your computing environment from electrical power sags and power losses, power spikes, lightning strikes, and electromagnetic interference.

Instead of plugging your computer directly into the wall electrical outlet, it is a good idea to plug it into a power protection device such as surge

protector, voltage regulator, UPS (Uninterruptible Power Supply).

*Use a stabilizer to ensure the level of voltage being supplied at a desired level:* Plug your computer into a stabilizer to adjust for power variations, which will deliver a consistent voltage level to the equipment. Power fluctuations can cause damage to electrical motors and components. This damage could be severe and immediate, or it could result in a shorter operating lifespan.

*Consider using a UPS to protect against complete absence of electricity:* Consider plugging your computer into a UPS (Uninterruptible Power Supply). The UPS is kind of a short-term battery that, when the power fails, will keep your computer running long enough (5–30 minutes) for you to save your data before you turn off the computer. It also acts as a surge protector.

3. *Diskfragmenter:* When you delete old files from your hard disk and add new ones, something happens: The files become fragmented. *Fragmentation is the scattering of portions of files about the disk in nonadjacent areas, thus greatly slowing access to the files.*

When a hard disk is new, the operating system puts files on the disk contiguously (next to one another). However, as you update a file over time, new data for that file is distributed to unused spaces. These spaces may not be contiguous to the older data in that file. It takes the operating system longer to read these fragmented files. *A defragmenter utility program, commonly called a "defragger," will find all the scattered files on your hard disk and reorganize them as contiguous files.* Defragmenting the files will speed up the drive's operation.

*Disk Cleanup:* The disk cleanup utilities can search for and remove unnecessary files, such as temporary files, or "temp files". Both Windows and the applications you run create temp files needed only for short tasks and system restore (return to normal operating conditions) after certain types of system problems. These files are stored in the Temp folder. For example, when you create a word document, Word will store a

temp file version of it in the Temp folder. When you save this document, Word will save it to the location you designated and delete the temp file. The computer should delete temp files when a program is closed, but this does not always happen. Also, files will be left in the Temp folder if the computer crashes. Thus temp files can accumulate in the Temp folder and take up space.

In Windows XP, run Disk Cleanup to determine how much hard disk space you can free up. Then choose which files to get rid of.

To use Windows Disk Cleanup,

Click *Start* → *All Programs* → *Accessories* → *System Tools* → *Disk Cleanup*

4. *Ergonomically correct computer and seating:*  
Ergonomics is the study of the interaction

between people and machines. The purpose of ergonomics is to make working conditions and equipment safer and more efficient. It is concerned with designing hardware and software that is less stressful and more comfortable to use, that blends more smoothly with a person's body or actions. Examples of ergonomic hardware are tilting display screens, detachable keyboards, and keyboards hinged in the middle to allow the users' wrists to rest in a more natural position.

More important than any computer system and (probably) any data is computer user's health. The most serious effects are painful hand and wrist injuries, eyestrain and headache, and back and neck pains. You can avoid most of these problems, if not all, by sitting properly.

Figure 3.3 shows the correct sitting posture:

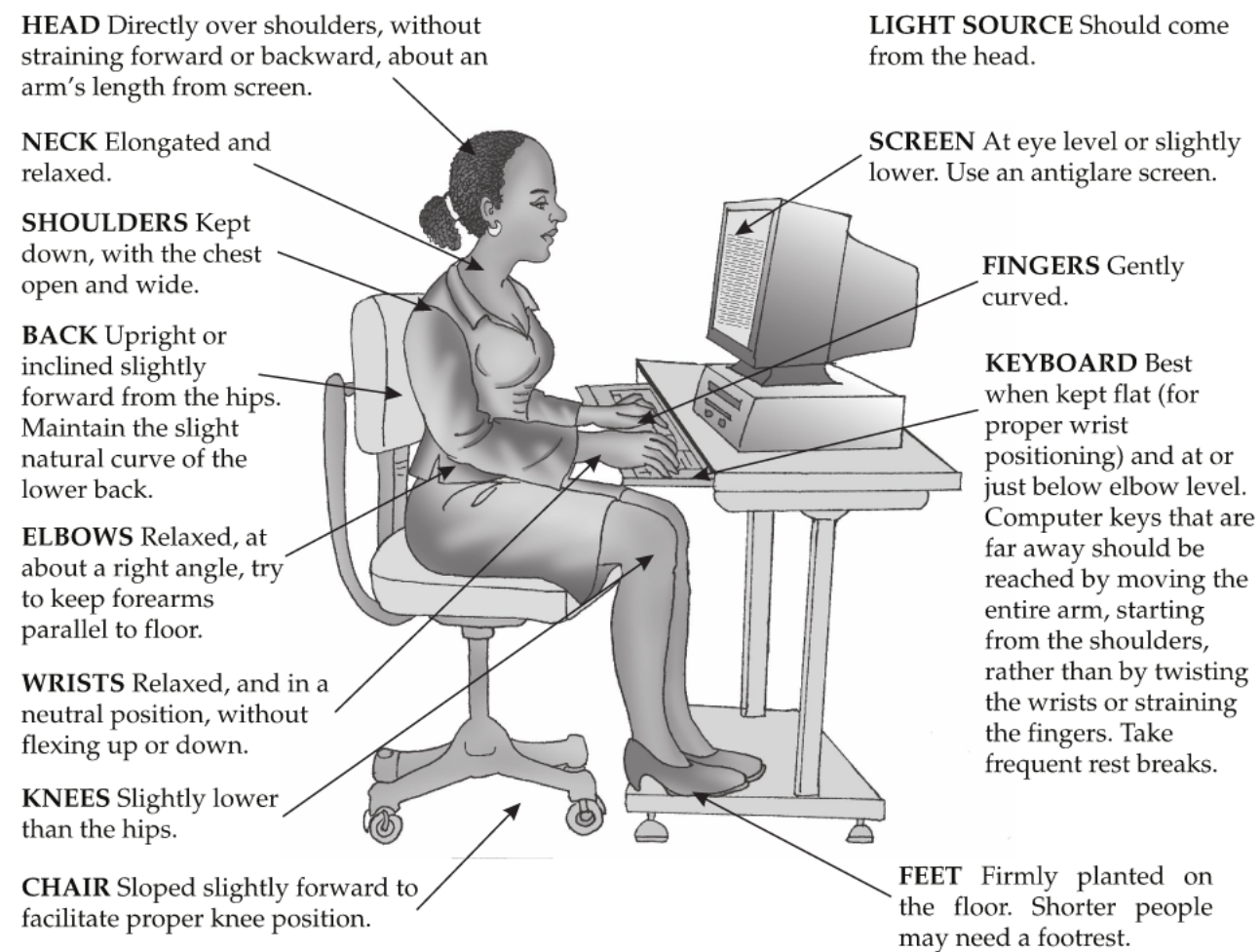


Fig. 3.3: Correct sitting posture

5. The knowledge about installing and uninstalling application software plays an important role in basic troubleshooting of the computer. If you do not know about it, then call tech support.

*Steps for installing application software:* You will need the Readme instructions, the disk containing the program, and perhaps the serial number or key of either the software being installed or your computer.

- (i) Read Readme (The piece of paper available with the software or a file on the software CD).
- (ii) Insert the Install disk in the computer's CD-ROM drive.
- (iii) Follow the instructions (The serial number of key will be in the box of software, or inside the manual).
- (iv) Keep going until installation is over (Choose the default options, which will reinstate the conditions that were standard with the program as you purchased it).
- (v) Reboot the system, if necessary.

*Steps for uninstalling application software:* There are several reasons why you may want to uninstall application software from your computer. It could be that the software is no longer being used and is unnecessary, it conflicts with other programs, it is not functioning as expected or you just want to free up some space on your computer's hard drive. Whatever the reason, it is not difficult to uninstall a software.

- (i) Click *Start* → *Control Panel*.
- (ii) Open the *Add and Remove Programs* dialog box in *Control Panel*.

- (iii) Select the desired application which you want to uninstall. Click *Remove button*.
- (iv) Click *OK* button to confirm the removal of application software.
- (v) Uninstalling process will start.
- (vi) After few minutes, the application software will be successfully uninstalled.
- (vii) After completion of setup, you may be asked for rebooting the system. Reboot the system, if necessary.

#### **Suggested Activities**

Refer to sub-units 3.1 to 3.4 of the Student Textbook for doing the activities.

#### **ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL**

The ICT teachers can use Internet, charts, worksheets, models, go for educational field trips and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning about "Basic Troubleshooting".

#### **ADDITIONAL QUESTIONS**

1. How will you back up files stored in the computer?
2. Define Electro Static Discharge (ESD) and identify some ESD types. Also list some ESD protection devices.
3. Describe the general steps to troubleshoot problems.
4. How will you troubleshoot minor problems related with some common input and output devices?



# UNIT 4

# EXPLOITING THE INTERNET (18 PERIODS)

## UNIT OUTCOME

### Students will be able to:

- find specific information on the world wide web in the form of text, images or sound required to solve a problem
- develop an awareness of web developments in making information available in different formats.

## SUGGESTED LESSON PLAN

Sub-units	Number of Periods
4.1 Advanced Searching	4
4.2 Using Wikis, Blogs and Podcasts	4
4.3 Social Networking	2
4.4 Producing a Webpage Using Simple Web Design Software	4
4.5 Publishing to a Web Server (or free Web Server or a Wikipedia Web Server)	4

## STRUCTURE OF THE UNIT

### 4.1 Advanced Searching

In this sub-unit, we will learn about advanced searching. The topics to be learnt are:

Exact match

- “x” or “y”
- “x” and “y”
- “x” but “y”
- Language limitations

### 4.2 Using Wikis, Blogs and Podcasts

In this sub-unit, we will learn about using Wikis, Blogs and Podcasts.

### 4.3 Social Networking

In this sub-unit, we will learn about social networking.

### 4.4 Producing a Webpage using simple Web design software

In this sub-unit, we will learn about producing a Webpage using simple Web design software.

### 4.5 Publishing to a Web Server (or free Web Server or a Wikipedia Web Server)

In this sub-unit, we will learn about publishing to a Web Server (or free Web Server or a Wikipedia Web Server).

## REVIEW OF THE UNIT

- Nearly all search engines have an advanced search option.
- Wikis are webpages that can be viewed and modified by anyone with a web browser and Internet access.
- Many users of the Internet have fun keeping journals, or web logs—called blogs for short—accessible to users.
- Podcasts are online broadcasts that can be downloaded to portable devices.

- Social networking is the grouping of individuals or organizations into specific groups.
- We can produce a webpage using simple web design software and publish it to a web server.

### ROLE OF THE STUDENTS

In this unit, the students are supposed to learn about exploiting the Internet. The activity based method should be followed to understand the subject matter which is the best way of better understanding of the subject matter.

The Internet is an extremely useful resource for students. There is a lot of information on the World Wide Web in the form of text, images or sound which can help students in solving problems. They must be very careful while using information from the Internet. Students should also learn important multimedia skills and how to share their creations through read/write Web tools such as blogs, wikis, podcasts, and social networks. They should produce a webpage using Web design and publish it to a web server.

### ADDITIONAL CLASS ACTIVITY FOR GIFTED STUDENTS OR SLOW LEARNERS

#### ACTIVITY 4.1: Internet Protocols

Teacher will explain and demonstrate to students about Internet protocols.

##### Internet

The Internet is a global system of interconnected computer networks that uses the standard Internet Protocol Suite (TCP/IP) to share information over billions of users worldwide.

The Internet carries a vast range of information resources and services, such as the inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support e-mail. Figure 4.1 shows Internet Explorer browser, for surfing the Internet.

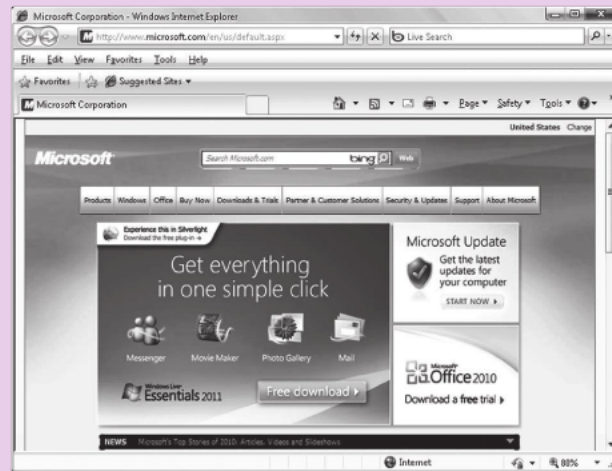


Fig. 4.1: Internet Explorer for surfing the Internet

##### Internet Protocols

A protocol is a set of rules which is used by computers to communicate with each other across a network. There are a number of protocols used in computing. The most popular ones are:

##### TCP/IP

One of the most common ways used by computers to send information across the Internet is by using two protocols (called TCP and IP) together.



**TCP (Transmission Control Protocol)**

It adds extra information to each packet to make sure that when they are received at the destination computer (by using IP) they have not been damaged, none of them are missing, and they are all put back together in the right order. If any packets are missing or damaged, a request is sent back to re-send those packets before the information is reassembled.

**IP (Internet Protocol)**

It works by giving each machine on the internet a unique 12 digit IP address (like 142.109.265.155). When a computer wants to send information across the internet, the information is broken into small segments called packets, and each packet is stamped with a “to” and “from” IP address. The packets are then sent across the internet to their destination.

**HTTP (Hyper Text Transfer Protocol)**

It means pages automatically load (automatically saved in cache instead of asking you where you want to save it). Original use of HTTP was to give people a way to publish and retrieve hypertext pages within the Internet.

**FTP (File Transfer Protocol)**

It is used to transfer files over a network to other computers. The difference from HTTP is that you indicate where you want to save the files to (or upload them from).

Files offered cover nearly anything that can be stored in a computer. For example, photos, gaming, music and statistics.

**POP3 (Post Office Protocol 3)**

POP3 is an internet-based standard for retrieval of e-mail by a user from an e-mail server. POP stands for Post Office Protocol. The “3” means it is the third revision of the standard.

**ANSWERS TO REVIEW QUESTIONS****Fill in the Blanks**

1. search engines
2. Wikis
3. Podcasts
4. Facebook, Twitter, Orkut

**State Whether True or False**

1. False
2. True
3. True
4. False

**Multiple Choice Questions**

1. (c)
2. (d)
3. (a)
4. (c)

**Match the Following**

1. (d)
2. (c)
3. (b)
4. (a)

**Answer the Following**

1. *Using the Boolean searching techniques:* Boolean search techniques can be used to carry out effective searches, cutting out many unrelated documents. You can broaden or narrow your search by combining words or phrases using the Boolean operators AND, OR, and NOT.

The AND operator narrows a search, the OR operator broadens a search, and NOT operator excludes material from a search.

*Improvements:* Many search engines have an Advanced Search interface that allows for Boolean searching; you can also try just using a Boolean operator in the main search box. For example, the search engines *Google* and *Yahoo* provide advanced web searching methods.

To open *Google Advanced Search form*, click on the *Advanced Search* hyperlink on the right side of the *Google Search box* at [www.google.com](http://www.google.com).

Now, you can use the *Google Advanced Search* form for advanced searching. Type the desired search topic and press *Advanced Search* button, your advanced search will appear on the screen.

To open *Yahoo Advanced Web Search* page go to *www.yahoo.com*, click the down arrow in *More* option above the *Yahoo Web Search* box, then from the menu that appears click the *Advanced Search* hyperlink.

Now, you can use the options on the *Yahoo Advanced Web Search* page to create a very specific *search*. Just fill in the fields you need for your current *search* and click the *Yahoo! Search* button, your advanced search will appear on the screen.

2. **Wikis:** These are Webpages that can be viewed and modified by anyone with a Web browser and Internet access.

A wiki is a website that allows the creation and editing of any number of interlinked webpages via a web browser using a simplified markup language or a WYSIWYG text editor. Wikis are typically powered by wiki software and are often used to create collaborative works. For example, community websites, corporate intranets, knowledge management systems, and note services. The software can also be used for personal note taking. Wikipedia is a well known wiki.

*Advantages:* Some advantages of using a wiki are:

- (i) Anyone can edit.
- (ii) Easy to use and learn.
- (iii) Wikis are instantaneous so there is no need to wait for a publisher to create a new edition or update information.
- (iv) People located in different parts of the world can work on the same document.
- (v) The wiki software keeps track of every edit made and it is a simple process to revert back to a previous version of an article.
- (vi) Widens access to the power of web publishing to non-technical users.
- (vii) The wiki has no predetermined structure—consequently it is a flexible tool which can be used for a wide range of applications.

- (viii) There is a wide range of open source software wiki has to choose from so licensing costs should not be a barrier to installing an institutional wiki.

*Disadvantages:* Some disadvantages of using a wiki are:

- (i) It can get messy, especially in big projects where a large number of people contribute.
- (ii) It requires some maintenance otherwise it will become unstable.
- (iii) The content management system is not good.

**Blogs:** Many users of the Internet have fun keeping journals, or web logs—called *blogs* for short, accessible to users. Blogs are often updated daily and reflect the personality and views of a blogger. Blog sites—for example, blogging network (*www.bloggingnetwork.com*) and Pyra Labs (*www.blogger.com*)—provide information about how you can create and maintain your own web log for a small fee.

*Advantages:* Some advantages of blogs are:

- (i) Blog sites can be developed with the help of simple procedures.
- (ii) A blog post goes public, in other words, it can be accessed and read by almost everyone who has an access to Internet.
- (iii) The usage of blogs are very convenient, hence people tend to use them more frequently.
- (iv) Students tend to improve their writing skills as blog articles should be reasonably good enough and free from grammatical mistakes.
- (v) Students get into the habit of writing, which helps them in all their future endeavours.
- (vi) Blog sites used as online class forums enable students to interact with various personalities to participate in a discussion far more effectively than they can otherwise.
- (vii) Individuals learn to express their opinions and exchange their views on topics of common interest, which not only keeps them updated but also makes them effective contributors of new ideas.
- (viii) Individuals get a chance to read other blogs, which indirectly helps them to improve upon their skill of writing.

(ix) Instructors of online classes get an opportunity to know what students feel about the class and its presentation quality and help to find ways to improve upon drawbacks if any.

(x) It is a place for students and individuals to share their articles and opinions with people outside their community.

*Disadvantages:* Some disadvantages of blogs are:

(i) It involves a lot of time to update and post an entry on the blog site.

(ii) Regular writing may give rise to slangs and sloppy way of writing, spoiling the quality of proper usage of language.

(iii) One major drawback is that not all information can be shared on blog sites. Hence, may not be useful for everyone.

(iv) Individuals and students may have reluctance in getting used to the technological advancements.

(v) Blogging cannot be thrust upon students who are hardly interested in reading and replying to the post.

(vi) Blogging on day-to-day issues is different from writing on a subject. Hence it may not be a practical idea to force students to do it.

(vii) There is no confidentiality as it is a public forum.

(viii) It is not suited for issues requiring immediate solution.

(ix) Blogs create a sense of students competing with each other just for posting entries. The fear of students getting diverted away from the subject is an issue of concern.

**Podcasts:** These are online broadcasts that you can download to portable devices. It is a piece of audio (usually an MP3 file) that can be automatically delivered to your computer, for you to listen to at your convenience. It might be a professional radio programme, a film review, a language lesson, a daily recipe. Whatever your interests, you are likely to find a podcast to fit the bill.

Podcasting lets you automatically receive the latest episode of your chosen programme as soon as it is available. With our current range

of audio podcasts, you can take your favourite radio programmes with you on the move and listen wherever and whenever you like.

You can “subscribe” to receive a podcast, rather like you might subscribe to a magazine and get it delivered each week. For example, all of the BBC’s podcasts are free, and you can stop receiving the files at any time. If you would rather not subscribe, you can download episodes of a podcast series individually.

In order to subscribe for a podcast, you need an Internet connection and a piece of podcast software which is usually available free of charge. Once you have installed this software, it will check the podcast for new episodes of your chosen podcast series and automatically download new episodes for you.

You can then listen to podcast episodes on your computer, or transfer them to a portable device, such as an MP3 player.

*Advantages:* Some advantages of podcasts are:

(i) Available anytime/anywhere for students.

(ii) Easy to create, distribute, and download—no professional equipment is required.

(iii) New podcasts are auto-downloaded.

(iv) Can restrict podcasts to students enrolled in the course.

(v) Power of audio over text—students can listen and learn while walking, riding, waiting in line, etc.

*Disadvantages:* Some disadvantages of podcasts are:

(i) Entire file is downloaded to user’s computer/device.

(ii) Need sufficient bandwidth to download the podcasts in a timely fashion.

(iii) Limited usefulness for hearing impaired people.

(iv) No interactivity—audience cannot participate, etc.

(v) Intellectual property issues.

3. *Social Networking:* Social networking is the grouping of individuals or organizations into



specific groups. Although social networking is possible in person, especially in the workplace, universities, and high schools, it is most popular online. This means that although you are in Ethiopia, you could develop an online friendship with someone in India or USA.

Initially social networking was an initiative to communicate amongst known and unknown users working over network worldwide. It has now turned into a much matured area to explore and exploit experiences and expertise of individuals sitting miles and miles away from each other. It gives a common platform to find people of varied interests and social backgrounds.

A number of people utilize the services of social networking sites as a common place to develop group projects on various subjects. It also helps to find out alumni and old friends and also allows you to contact and start fresh conversations. It creates an extended network by connecting friends of friends and further enabling the empowerment of knowledge and resources. The social networking websites are known as social sites. Some of the common social networking sites are Facebook, Twitter, Netlog, Hi5, Orkut, etc.

As mentioned earlier, social networking often involves grouping specific individuals or organizations together. While there are a number of social networking websites that focus on particular interests, there are others that do not. The websites without a main focus are often referred to as “traditional” social networking websites and usually have open memberships. This means that anyone can become a member, no matter what his hobbies, beliefs, or views are. However, once you are inside this online community, you can begin to create your own network of friends and eliminate members that do not share common interests or goals.

Although the idea of online social networking sounds very useful but there is certain element of risk and danger involved in it. Through networking you not only communicate with your

known ones but also to strangers and revealing your personal details to strangers can sometimes be very dangerous. Sometimes a stranger may pretend to be someone which he is not in reality. But then this type of risk is involved in real world too. Everyday, for the business purpose or otherwise, one has to meet and interact with many unknown people. In such situations we use our wisdom to calculate how much of ourselves to reveal before him. Similarly, while interacting online, one should use his inner voice to react accordingly. The other type of risk involved in social networking is hacking. Even if you are interacting with known people, your information and personal details can be hacked by hackers. So one has to be cautious and supply only minimum required details.

4. MS-Publisher 2007 is an excellent authoring tool to use when you want to quickly create, publish, and manage simple Webpage.

To create a webpage, perform the following steps:

- (i) Start Publisher.
- (ii) On the *File* menu, click *New*.
- (iii) In the *Publication Types* list, click *Web Sites*. Select any web design template from the *Newer Designs*.
- (iv) Click *Create*.
- (v) The *Easy Web Site Builder* dialog box appears.
- (vi) Click *OK*.
- (vii) Add content to your publication, and make any changes that you want.
- (viii) Click *Webpage Preview* in *Web Tools* or on the *File* menu, click *Webpage Preview*.
- (ix) The webpage is shown in your default browser.
- (x) Close the browser.

#### Suggested Activities

Refer to sub-units 4.1 to 4.5 of the Student Textbook for doing Activities 1, 2, 4 and 5.

**ACTIVITY 3: View and Listen to a Podcast, e.g., BBC**

Teacher will explain and demonstrate to students about viewing and listening to a Podcast, e.g. BBC.

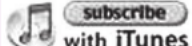
**Podcast**

A podcast describes a very simple concept: an audio or video file available on the Internet for you to listen to and/or watch. A podcast can also refer to a series of these audio or video files (similar to how a TV or radio “show” can be a series of shows or just one show). When using the word podcast, most people refer to the entire series and not just one audio or video file.

**Viewing and listening to podcasts**

It is best to listen to podcasts on an iPod or mp3 player which you can take with you wherever you are. Setting it up takes a few steps and once you have done that, everything is automated.

1. The easiest podcast application to use is iTunes - but remember that there are other options. Go to the *Apple iTunes* store and you will see the prominent section to *Download iTunes*, which will take you a page explaining what iTunes is with instructions. When you are ready, click the *Download Now* button on that page and follow the instructions.
2. Once iTunes is downloaded, open it up and go the iTunes Store. You will see a virtual store where you can download music, videos, podcasts and audiobooks - some of which are free and some are paid-for.
3. To find the Fusion View podcast in the iTunes Store, the easiest thing to do is to go to the Search box in the top right corner and type in Fusion View. My podcast will come up - click on that to see the episodes. Click Subscribe and iTunes will download the latest episode. In future, any time you open up iTunes, it will download the latest episode since your last download.

You can also click on the Subscribe with iTunes button  on the podcast posts.

Clicking on the above button will open up iTunes and subscribe to the Fusion View podcast automatically.

Many other podcasters have this or similar logos on their blogs so clicking on that will automatically subscribe you to their podcasts using iTunes.

4. If you want to get previous episodes on my podcast, go to the Library section of iTunes (left sidebar), click on Podcasts. This will take you to your library of podcasts that you have subscribed to. Click on Fusion View in the list of your podcasts and you will see a drop down list of previous podcasts in pale grey text to indicate that you have not downloaded them yet. Click on the “Get” button alongside whichever episodes you want to download.
5. To transfer podcasts from your iTunes library to your iPod or mp3 player, plug that device into your computer with iTunes open. iTunes should automatically recognise the device and take you through the steps to make the connection and download items from iTunes to the device.
6. Every time you then plug in your iPod or mp3 player to your computer, iTunes should automatically open up and transfer the latest episodes of podcasts you have subscribed to across to your device.

## BBC Podcast

There are great podcasts to download from the BBC. Figure 4.2 shows BBC podcast:

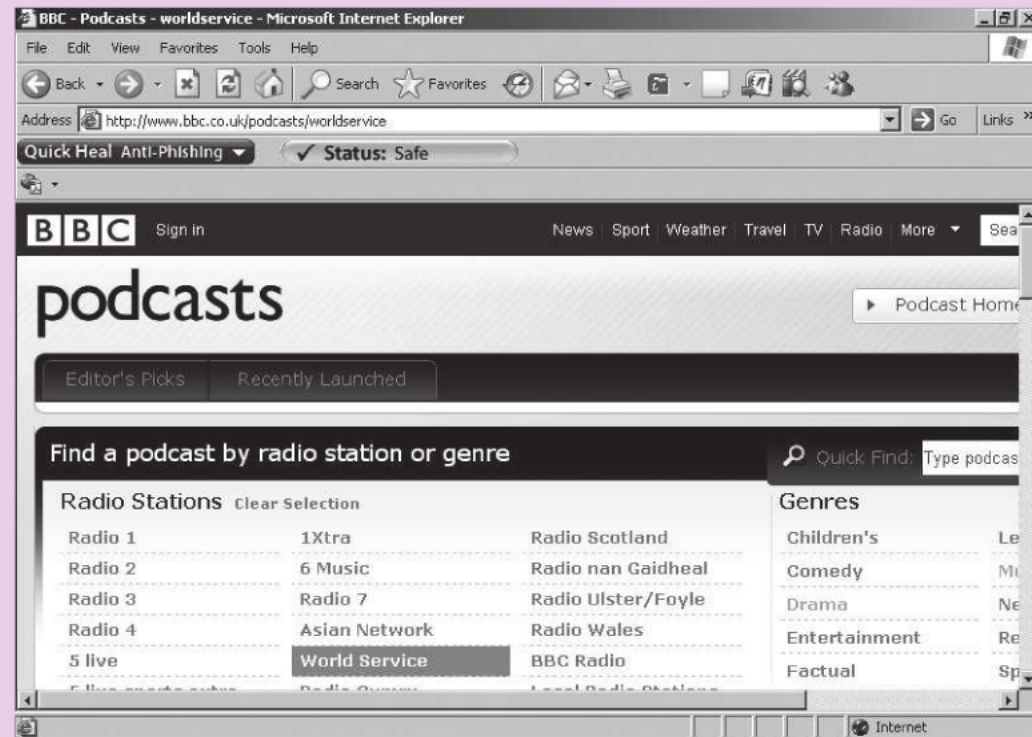


Fig. 4.2: BBC Podcast

### ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL

The ICT teachers can use Internet, charts, worksheets, models, go for educational field trips and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning about “Exploiting the Internet”.

### ADDITIONAL QUESTIONS

1. How will you search the Internet? Discuss.
2. How Internet can be used to study ICT? Discuss.
3. Write short notes on the following Internet resources:
  - (i) File Transfer Protocol (FTP)
  - (ii) Telnet
  - (iii) Newsgroups
  - (iv) Real-time chat.
4. List some advantages and disadvantages of social networking.
5. How will you design a simple webpage? Explain.



# UNIT 5

# IMAGE PROCESSING AND MULTIMEDIA SYSTEMS

(27 PERIODS)

## UNIT OUTCOME

### Students will be able to:

- understand the concept of image processing
- differentiate image file format
- recognize the function of image processing software
- recognize interface layout of image processing software
- edit images properly using image processing software.

## SUGGESTED LESSON PLAN

Sub-units	Number of Periods
5.1 Overview of Image Processing	6
5.2 Basics of Image Processing	10
5.3 Basic Image Editing (cropping, resizing, correcting, sharpening/softening)	11

## STRUCTURE OF THE UNIT

### 5.1 Overview of Image Processing

In this sub-unit, we will have an overview of image processing. The topics to be learnt are:

- Overview of image processing
- Definition of image processing
- Image processing software
- Image file format

### 5.2 Basics of Image Processing

In this sub-unit, we will learn basics of image processing. The topics to be learnt are:

- Getting started
- Opening new document
- Setting up a document
- Creating an image
- Saving image document
- Interface layout
- Inserting image from a file or other devices

### 5.3 Basic Image Editing (cropping, resizing, correcting, sharpening/softening)

In this sub-unit, we will learn about basic image editing. The topics to be learnt are:

- Basic image editing
- Cropping
- Resizing
- Correcting

- Sharpening/Softening
  - Sharpening
  - Softening

## REVIEW OF THE UNIT

- Pixel is the term used most widely to denote the elements of a digital image.
- Image processing is the set of computational techniques for analyzing, enhancing, compressing, and reconstructing images, generally with a digital computer.
- Photoshop is a popular image processing software that provides numerous tools for editing an image.
- The basic image editing techniques are useful when working with digital scans of images. We can apply these basic techniques in a wide variety of image editing situations.

- Cropping is the process of removing portions of an image to create focus or strengthen the composition.

## ROLE OF THE STUDENTS

In this unit, the students are supposed to learn image processing and multimedia. The activity based method should be followed to understand the subject matter which is the best way of better understanding of the subject matter.

Digital image processing enables us to get the best quality pictures. It is all about enhancing various features of an image. In today's computers, media information such as audio, images, and video have become necessary for daily business operations and entertainment. So, the students should study the basic digital image processing techniques. They should also know the basic components of multimedia and have skills to work with them.

## ADDITIONAL CLASS ACTIVITY FOR GIFTED STUDENTS OR SLOW LEARNERS

### ACTIVITY 5.1: Basic Concepts of Multimedia

Teacher will explain and demonstrate basic concepts of multimedia.

#### What is Multimedia?

It is any combination of text, art, sound, animation, and video delivered to you by computer or other electronic or digitally manipulated means. Figure 5.1 shows multimedia elements.



Fig. 5.1: Multimedia Elements

#### Multimedia Computer System

A multimedia computer system is one that can create, import, integrate, store, retrieve, edit, and delete two or more types of media materials in digital form, such as audio, image, full motion video, and text information. Figure 5.2 shows a multimedia computer system.





Fig. 5.2: Multimedia Computer System

**Primary Multimedia Delivery Media**

Multimedia projects often require a large amount of digital memory; hence they are often stored on CD-ROM or DVDs. Multimedia also includes webpages in HTML or DHTML (XML) on the World Wide Web.

**Areas of Use**

Multimedia is appropriate wherever a person interacts with electronic information. The areas in which multimedia presentations are suitable include education, training, marketing, advertising, product demos, databases, catalogs, entertainment, and networked communications.

## ANSWERS TO REVIEW QUESTIONS

**Fill in the Blanks**

1. digital image processing
2. Image processing
3. Cropping
4. Resizing

**State Whether True or False**

1. True
2. False
3. True
4. False

**Multiple Choice Questions**

1. (d)
2. (d)
3. (c)
4. (a)

**Match the Following**

1. (b)
2. (a)
3. (d)
4. (c)

**Answer the Following**

1. **Image Processing:** It is the set of computational techniques for analyzing, enhancing, compressing, and reconstructing images, generally with a digital computer.

**Image File Formats:** We can use a variety of file formats in image processing and multimedia systems. Some of the more common formats are:

**GIF (Graphics Interchange Format):** It is pronounced "jif", supports upto 256 colors (8 bits per pixel). It is a compressed format that keeps file sizes smaller. This format is widely used on the Web since files can be sent faster than many other formats and groups of them can be animated. Files in this format have the extension *.gif*.

**JPEG (Joint Picture Experts Group):** It is pronounced "jay peg". It supports 16.7 million colors (24 bits per pixel). The images are in compressed format so file sizes are even smaller than GIF files. Files in this format have the extension *.jpg*.

**BMP (Bitmap):** It is a standard uncompressed format for Microsoft Windows and IBM OS/2. Stores files as a series of dots, or pixels. It has a maximum of 16.7 million colors (24 bits per pixel) and files have the extension *.bmp*.

*TIFF (Tagged Image File Format)*: It stores compressed files with a flexible number of bits per pixel. It provides the highest quality but has large file sizes. This format supports 16.7 million colors (24 bits per pixel) and files have the extension *.tif*.

2. To open and setup a new document in Photoshop, perform the following steps:

- (i) Click *File* → *New*. It will open the *New* dialog box.
- (ii) Choose a desired option from *Preset* such as Default Photoshop Size, U.S Paper Photo, and Web, etc. Set the Size of *Preset* as your need.
- (iii) Click *OK*. It will setup the new document.

Now, you can add graphics and text in the document as per your need.

To save an image document,

Click *File* → *Save As*

The *Save As* dialog box will open.

Type the filename, select the desired image format and click *Save*.

3. Adobe Photoshop CS5 interface layout is listed and explained below:

*Application bar* is displayed at the top of the screen. In the *Application bar* are the Photoshop application icon, the main menu (Windows only), application controls, View controls, the workspace switcher, and a button to access CS Live. Below the *Application bar* is the *Options bar*, with the *Tools panel* on the left, panels, and one or more document windows that are opened separately.

The *main menu* across the bottom of the *Application bar* organizes commands in individual menus.

The *Options bar* displays options for the currently selected tool.

The *document window* displays the file you are working on.

The *Tools panel* contains tools for creating and editing images, artwork, page elements, and so on. Related tools are grouped together.

*Panels* help you monitor and modify your work. An example is the *Layers panel*. Certain panels are displayed by default, but you can add any

panel by selecting it from the *Window* menu. Many panels have menus with panel-specific options. You can separate, group, stack, and dock panels into your preferred layout.

4. The basic image editing techniques are useful when working with digital scans of images. We can apply these basic techniques in a wide variety of image editing situations.

#### **Cropping**

Cropping is the process of removing portions of an image to create focus or strengthen the composition. You can crop an image using the *Crop Tool* and the *Crop* command. You can also trim pixels using the *Crop And Straighten* and the *Trim* commands.

To crop an image, perform the following steps:

- (i) Open the image file you want to crop and click on the *Crop Tool* from *Tools panel*.
- (ii) Click and drag the mouse button to make a crop box.
- (iii) Press the *Enter* key to crop the image.

The selected area of image will be cropped.

#### **Resizing**

There will be times when you need to make an object bigger or smaller as you copy it from one picture to another.

To resize an image, perform the following steps:

- (i) Open the image file you want to resize.
- (ii) Click *Image* from the *Menu bar* and then select *Image Size....* It will open *Image Size* dialog box.
- (iii) Set new image size using *Pixel Dimensions* or *Document Size* and click *OK*.

The image will resize as per your entered dimensions.

#### **Correcting**

Adjusting proper intensity, contrast range, and color balance is very easy using image processing programs. Suppose, we want the color adjustment.

To adjust the color balance, perform the following steps:

- (i) Open the image file.

- (ii) Click *Image* from the *Menu bar Adjustments* → *Color Balance...* It will open *Color Balance* dialog box.
- (iii) Set your desired color balance and click *OK*.

#### **Sharpening/Softening**

Generally, a scanned image is not as sharp as you might wish. Sometimes you may get very sharp image. So, you may require sharpening/softening of the image. First of all open the document having the image to sharpen/soften.

For sharpening an image,

Click *Filter* from the *Menu bar* → *Sharpen*.

The options available are: *Sharpen*, *Sharpen Edges*, *Sharpen More*, *Smart Sharpen* and *Unsharp Masks*.

Select the desired option. The image will sharpen.

For softening an image,

Click *Filter* from the *Menu bar* → *Blur*.

The options available are: *Average*, *Blur*, *Blur More*, *Box Blur*, *Gaussian Blur*, *Lens Blur*, *Motion Blur*, *Radial Blur*, *Shape Blur*, *Smart Blur* and *Surface Blur*.

Select the desired option. The image will soften.

#### **Suggested Activities**

Refer to sub-units 5.1 to 5.3 of the Student Textbook for doing the activities.

#### **ALTERNATIVE TEACHING APPROACHES, ENRICHMENT MATERIAL**

The ICT teachers can use Internet, charts, worksheets, models, go for educational field trips and subject experts can be called for seminars to enrich the teaching level and in turn help the students in learning about “Image Processing and Multimedia Systems”.

#### **ADDITIONAL QUESTIONS**

1. Discuss the fundamental steps in digital image processing.
2. List some image processing programs and discuss their capabilities.
3. Discuss some drawing tools of Adobe Photoshop.
4. Identify applications of multimedia and explain how multimedia is used on the Web.



## GRADE 11 MINIMUM LEARNING COMPETENCIES (MLCs)

S. No.	Units	Minimum Learning Competencies (MLCs)
1.	<b>Information System</b>	<ul style="list-style-type: none"> <li>Describe some applications of ICT</li> <li>Explain the definition of each types of IS</li> <li>Explain the application of each types of IS</li> <li>Describe the impact of ICT in everyday life</li> </ul>
2.	<b>Enhancing the Use of Software</b>	<ul style="list-style-type: none"> <li>Solve problems by specific software</li> <li>Illustrate their ideas</li> <li>Organising their contents</li> <li>Testing their hypotheses</li> </ul>
3.	<b>Basic Troubleshooting</b>	<ul style="list-style-type: none"> <li>Identify proper location for the computer</li> <li>Protect computers from harm and damage</li> <li>Explain possible problems that may occur with the power supply</li> <li>Explain the use of stabilisers and UPS</li> <li>Back up files stored in the computer</li> <li>Use defragmenter and disk cleanup to improve hard disk performances</li> <li>Apply safe methods</li> <li>Define ESD (Electro Static Discharge)</li> <li>Identify some ESD types</li> <li>List some types of ESD protection devices</li> <li>Explain the concept of ergonomically correct computer and seating</li> <li>Plug properly input and output devices with the system unit</li> <li>Describe the general steps to troubleshoot problems</li> <li>Troubleshoot minor problems related with some common input and output devices</li> <li>Install and uninstall applications software</li> </ul>
4.	<b>Exploiting the Internet</b>	<ul style="list-style-type: none"> <li>Use Boolean searching techniques</li> <li>Report on improvements</li> <li>Explain the functionality of wikis, blogs and podcasts</li> <li>List the advantages of their use</li> <li>Explain what is meant by “social networking”</li> <li>Design a simple webpage</li> <li>Implement the webpage publish webpage</li> </ul>
5.	<b>Image Processing and Multimedia Systems</b>	<ul style="list-style-type: none"> <li>Define Image processing</li> <li>List and explain different types of image file formats</li> <li>Open and setup a new document.</li> <li>Save an image document.</li> <li>List and explain common interface layout of image processing software</li> <li>Edit an image in a desired way</li> </ul>

## GRADE 11 SYLLABUS

### INTRODUCTION

In the preparatory schools students follow either the Social Science stream or the Natural Science stream; all students will continue to study IT.

In the long term, students will follow a common course of IT, irrespective of which stream they are in. This course will cover Information Systems, Basic troubleshooting, Image processing and Multimedia Systems in some depth. There will also be many opportunities to use software applications and tools that they have encountered during studies in earlier grades.

In future years, students may elect to follow a more-specialist course in Computer Science covering such areas as Computer Architecture, Systems Analysis and Design, Data Communications and Fundamentals of Programming.

In the short term, Grades 11 and 12 students will continue to follow the old Information Technology course until it is appropriate to introduce the new curriculum as described above.

**UNIT 1: INFORMATION SYSTEMS  
(15 PERIODS)**

**Unit Outcome:** Students will be able to:

- know the application of ICT in different sectors;
- understand the components of an Information System;
- recognise the application of ICT in different sectors;
- recognise how ICT can change the life of people.

Competencies	Contents	Suggested Activities
<ul style="list-style-type: none"> <li>• Describe some applications of ICT.</li> </ul>	<p><b>1.1 General Concepts of Information Systems</b></p> <ul style="list-style-type: none"> <li>• Some Applications of ICT at Home, Office, Factory, Transport, Communications, Education/training and Health</li> </ul>	<ul style="list-style-type: none"> <li>• Students should identify the application of ICT.</li> <li>• Explain and demonstrate detailed examples of applications of ICT in the areas listed.</li> </ul>
<ul style="list-style-type: none"> <li>• Explain the definition of each type of IS.</li> <li>• Explain the application of each type of IS.</li> </ul>	<p><b>1.2 Types of Information System in the Organization</b></p> <ul style="list-style-type: none"> <li>• Definition of system and characteristics</li> <li>• Application of information system types                             <ul style="list-style-type: none"> <li>- Transactional information system</li> <li>- Management information system</li> <li>- Decision support system</li> <li>- Executive information system</li> <li>- Office automation information system</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Explain the types of information system.</li> <li>• Explain the definitions of the all types of information system.</li> <li>• Explain the application of all types of Information Systems e.g. Describe the main advantages and disadvantages of an online Airline timetable and a printed one.</li> <li>• Students should describe the types of information system.</li> </ul>



Competencies	Contents	Suggested Activities
<ul style="list-style-type: none"> <li>Describe the impact of ICT in everyday life.</li> </ul>	<p><b>1.3 Impact of ICT in Everyday Life</b></p> <ul style="list-style-type: none"> <li>Define a digital device</li> <li>Impact of using computers in offices</li> <li>Impact of mobile phones</li> <li>Impact of satellite broadcasting</li> <li>Differences between an information-poor and information-rich society</li> </ul>	<ul style="list-style-type: none"> <li>Students should describe the impact of ICT in everyday life, considering the aspects listed.</li> <li>Explain why the mobile phone has been such a successful technology.</li> </ul>

## ASSESSMENT

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

### Students At Minimum Requirement Level

A student working at the minimum requirement level will be able to: describe some applications of ICT, explain the definition of each types of IS, explain the application of each types of IS and describe the impact of ICT in everyday life.

### Students Above Minimum Requirement Level

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

### Students Below Minimum Requirement Level

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.

## UNIT 2: ENHANCING THE USE OF SOFTWARE (24 PERIODS)

**Unit Outcome:** Students will be able to:

- recognise to choose appropriate software tools to solve problems, illustrate ideas, and clarify thinking in the other subjects chosen for study in grade 11.

Competencies	Contents	Suggested Activities
<ul style="list-style-type: none"> <li>• Solve problems by specific software.</li> <li>• Illustrate their ideas.</li> <li>• Organise their contents.</li> <li>• Test their hypotheses.</li> </ul>	<p><b>2.1 Using Application Software</b></p> <ul style="list-style-type: none"> <li>• Word processing,               <ul style="list-style-type: none"> <li>– Overview</li> <li>– Section breaks</li> <li>– Mail merge</li> <li>– Header &amp; Footer</li> </ul> </li> <li>• Presentation software               <ul style="list-style-type: none"> <li>– Overview</li> </ul> </li> <li>• Spreadsheets,               <ul style="list-style-type: none"> <li>– Overview</li> <li>– If condition with AND or OR</li> </ul> </li> <li>• Publishing software               <ul style="list-style-type: none"> <li>– Overview</li> </ul> </li> <li>• Database management               <ul style="list-style-type: none"> <li>– overview</li> <li>– Main/sub reports</li> <li>– Group section</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Students should use the correct software tool and will enhance knowledge of IT at the same time as the chosen subject.</li> <li>• This should be done by joint assessment by IT teacher and subject teacher.</li> <li>• Students should use appropriate software tools e.g. spreadsheet package to solve a mathematical problem.</li> </ul>

**ASSESSMENT**

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum require level.

**Students at Minimum Requirement Level**

A student working at the minimum requirement level will be able to: solve problems by specific software, illustrate their ideas, organising their contents and testing their hypotheses.

**Students Above Minimum Requirement Level**

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

**Students Below Minimum Requirement Level**

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.



### UNIT 3: BASIC TROUBLESHOOTING (18 PERIODS)

**Unit Outcome:** Students will be able to:

- recognise basic idea in preventive maintenance;
- apply the knowledge gained in preventive maintenance to prolong the life of the computer;
- be aware of basic safety issues;
- recognise major hardware components inside the computer;
- acquire knowledge on how to format hard disk and install software.

Competencies	Contents	Suggested Activities
<ul style="list-style-type: none"> <li>• Identify proper location for the computer.</li> <li>• Protect computers from harm and damage.</li> <li>• Explain possible problems that may occur with the power supply.</li> <li>• Explain the use of stabilisers and UPS.</li> <li>• Back up files stored in the computer.</li> <li>• Use defragmenter and disk cleanup to improve hard disk performance.</li> </ul>	<p><b>3.1 Basics of Preventative Maintenance</b></p> <ul style="list-style-type: none"> <li>• Environment and location of a computer</li> <li>• Electric power</li> <li>• Back up methods</li> <li>• Manual</li> <li>• Using utility programs</li> <li>• Improving hard disk performance</li> <li>• Disk defragmenter</li> <li>• Disk cleanup</li> </ul>	<ul style="list-style-type: none"> <li>• The teacher will explain and demonstrate.</li> <li>• The students will practise as the teacher instructs about: <ul style="list-style-type: none"> <li>○ Environment and location of a computer, Computer cleaning tools, Compressed air, Liquid cleaning compounds, Clean or soapy water and a damp cloth, Glass cleaner, Lint free cloth.</li> <li>○ Electric power, Input voltage (220V), Plugging power cable, Electric power fluctuation, Power surge, Power sags, Power spike, Avoiding electrical problems, UPS expand ups, Standby power system, Surge suppressors.</li> <li>○ Back up methods, Manual.</li> <li>○ Using utility programs.</li> <li>○ Improving hard disk performance.</li> <li>○ Disk Defragmenter.</li> <li>○ Disk cleanup.</li> </ul> </li> </ul>

Competencies	Contents	Suggested Activities
<ul style="list-style-type: none"> <li>Apply safe methods.</li> <li>Define ESD.</li> <li>Identify some ESD types.</li> <li>List some types of ESD protection devices.</li> <li>Explain the concept of ergonomically correct computer and seating.</li> <li>Plug properly input and output devices with the system unit.</li> <li>Describe the general steps to troubleshoot problems.</li> </ul>	<p><b>3.2 Basic Safety Issues (should mention eyestrain somewhere!!)</b></p> <ul style="list-style-type: none"> <li>Overview of safety measures</li> <li>Electro Static Discharge (ESD)</li> <li>Hidden ESD</li> <li>Catastrophic ESD</li> <li>Degradation</li> <li>Some common ESD protection devices</li> <li>Anti-static wrist and ankle straps</li> <li>Anti-static mats</li> <li>Setting up an ergonomic computer and seating</li> </ul>	<ul style="list-style-type: none"> <li>Explain the concept of safety precautions, ESD and its effect. Explain and demonstrate.</li> <li>ESD protection devices and an ergonomically correct computer.</li> </ul>
<ul style="list-style-type: none"> <li>Troubleshoot minor problems related with some common input and output devices.</li> </ul>	<p><b>3.3 Hardware Maintenance Basics</b></p> <ul style="list-style-type: none"> <li>Connecting basic input and output devices with the system units</li> <li>Checking dead system</li> <li>General steps to troubleshoot problems</li> <li>Troubleshooting common input and output devices</li> </ul>	<ul style="list-style-type: none"> <li>The teacher will demonstrate how to plug properly input and output devices with a system unit.</li> <li>Explain the basic steps to follow while troubleshooting problems.</li> </ul>

Competencies	Contents	Suggested Activities
<ul style="list-style-type: none"> <li>Install and uninstall applications software.</li> </ul>	<p><b>3.4 Installing and Uninstalling Applications Software</b></p> <ul style="list-style-type: none"> <li>Installing application software e.g. (Microsoft Office)</li> <li>Uninstalling application software e.g. (Microsoft Office)</li> </ul>	<ul style="list-style-type: none"> <li>The teacher will explain and demonstrate how to install and uninstall application software.</li> </ul> <p>The students will practice used computer and Application software CD, Ask the students to install and uninstall an application system.</p>

### ASSESSMENT

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

#### Students At Minimum Requirement Level

A student working at the minimum requirement level will be able to: Identify proper location for the computer, Protect computers from harm and damage, Explain possible problems that may occur with the power supply, Explain the use of stabilisers and UPS, Back up files stored in the computer, Use defragmenter and disk cleanup To improve hard disk performances, Apply safe methods, Define ESD, Identify some ESD types, List some types of ESD protection Devices, Explain the concept of ergonomically correct computer and seating, Plug properly input and output devices with the system unit, Describe the general steps to troubleshoot problems, Troubleshoot minor problems related with some common input and output devices, and install and uninstall applications software.

#### Students Above Minimum Requirement Level

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

#### Students Below Minimum Requirement Level

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.



## UNIT 4: EXPLOITING THE INTERNET (18 PERIODS)

**Unit Outcome:** Students will be able to:

- find specific information on the world wide web in the form of text, images or sound required to solve a problem;
- develop an awareness of web developments in making information available in different formats.

Competencies	Contents	Suggested Activities
<ul style="list-style-type: none"> <li>• Use Boolean searching techniques.</li> <li>• Report on improvements.</li> </ul>	<b>4.1 Advanced Searching</b> <ul style="list-style-type: none"> <li>• Exact match</li> <li>• “x” or “y”</li> <li>• “x” and “y”</li> <li>• “x” but “y”</li> <li>• Language limitations</li> </ul>	<ul style="list-style-type: none"> <li>• Using handout from teacher to solve problems involving IT in some way e.g., Explore connection between Newman Hollenith and the millennium bug.</li> </ul>
<ul style="list-style-type: none"> <li>• Explain the functionality of wikis, blogs and podcasts, list the advantages of their use.</li> </ul>	<b>4.2 Using Wikis, Blogs and Podcasts</b>	<ul style="list-style-type: none"> <li>• Visit atleast one wiki e.g., wikipedia.</li> <li>• Set up a blog about life in their community.</li> <li>• View and listen to a podcast e.g, BBC.</li> </ul>
<ul style="list-style-type: none"> <li>• Explain what is meant by “social networking” .</li> </ul>	<b>4.3 Social Networking</b>	<ul style="list-style-type: none"> <li>• Students should join a social network e.g., face book, his etc.</li> </ul>
<ul style="list-style-type: none"> <li>• Design a simple webpage.</li> </ul>	<b>4.4 Producing a Webpage Using Simple Web Design Software</b>	<ul style="list-style-type: none"> <li>• Students should have computers and access to the internet and webpage software.</li> </ul>
<ul style="list-style-type: none"> <li>• Implement the webpage Publish webpage.</li> </ul>	<b>4.5 Publishing to a Web Server (or Free Web Server or a Wikipedia Web Server)</b>	<ul style="list-style-type: none"> <li>• Students should implement the webpage by selecting free web server or a wikipedia web server.</li> </ul>

**ASSESSMENT**

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

**Students At Minimum Requirement Level**

A student working at the minimum requirement level will be able to: use Boolean searching techniques, report on improvements, Explain the function ability of wikis, blogs and podcasts list the advantages of their use, and explain what is meant by "social networking".

**Students Above Minimum Requirement Level**

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

**Students Below Minimum Requirement Level**

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.

## UNIT 5: IMAGE PROCESSING AND MULTIMEDIA SYSTEMS (27 PERIODS)

**Unit Outcome:** Students will be able to:

- understand the concept of image processing;
- differentiate image file format;
- recognize the function of image processing software;
- recognize interface layout of image processing software;
- edit images properly using image processing software.

Competencies	Contents	Suggested Activities
<ul style="list-style-type: none"> <li>• Define Image processing</li> <li>• List and explain different types of image file formats</li> </ul>	<p><b>5.1 Overview of Image Processing</b></p> <ul style="list-style-type: none"> <li>• Overview of Image processing</li> <li>• Definition of image processing</li> <li>• Image processing software</li> <li>• Image file format</li> </ul>	<ul style="list-style-type: none"> <li>• Give a brief explanation of image processing.</li> <li>• Describe about image processing software and its function.</li> <li>• List and explain the different image file format.</li> <li>• Image file format Gif, Jpg, Bmp, and Tif.</li> </ul>
<ul style="list-style-type: none"> <li>• Open and setup a new document.</li> <li>• Save an image document.</li> </ul>	<p><b>5.2 Basics of Image Processing</b></p> <ul style="list-style-type: none"> <li>• Getting started</li> <li>• Opening new document</li> <li>• Setting up a document</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to get started of image processing software.</li> <li>• Demonstrate and explain the properties to be set in a document.</li> <li>• List and demonstrate interface layout of the image processing software listed under the content.</li> <li>• Students should practise setting up a document like Page size and orientation, Resolution, Color mode and Background content.</li> </ul>



Competencies	Contents	Suggested Activities
<ul style="list-style-type: none"> <li>List and explain common interface layout of image processing software.</li> </ul>	<ul style="list-style-type: none"> <li>Creating an image</li> <li>Saving image document</li> <li>Interface layout</li> <li>Inserting image from a file or other devices</li> </ul>	<ul style="list-style-type: none"> <li>Students should interface layout like Menu bar, Tool bar, Image area, Palettes, Navigator and Color swatch, Style, History, Layers, Tool box, Selection tools, Alteration tools, Drawing and Selection tools, Assisting tools and Color boxes and Modes.</li> </ul>
<ul style="list-style-type: none"> <li>Edit an image in a desired way.</li> </ul>	<p><b>5.3 Basic Image Editing (Cropping, Resizing, Correcting, Sharpening/Softening)</b></p> <ul style="list-style-type: none"> <li>Basic image editing</li> <li>Cropping</li> <li>Resizing</li> <li>Correcting</li> <li>Sharpening/Softening               <ul style="list-style-type: none"> <li>– Sharpening</li> <li>– Softening</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Students should define what an image editing is.</li> <li>Demonstrate and explain the image editing options listed under the content.</li> <li>Students should edit image with cropping like Cropping with the crop tool, Cropping to a specific size, and Cropping with the marquee tool.</li> <li>Students should resize image like Resizing to a specific size, Resizing Digital photo and Enlarging.</li> <li>Students should correct image like Red Eye removal, Hot Spot removal, Adding Flash, and Color Adjustment.</li> <li>Ask the students to scan their photograph and edit in the desired size and color.</li> <li>Resources: Computer, Image Processing Software, Scanner, Digital camera.</li> </ul>

### ASSESSMENT

The teacher should assess each student's work continuously over the whole unit and compare it with the following description, based on the specific objectives, to determine whether the student has achieved the minimum required level.

#### Students At Minimum Requirement Level

A student working at the minimum requirement level will be able to Define Image processing, List and, explain different types of image file formats, Open and setup a new document, Save an image document, List and explain common Interface layout of image processing software, and Edit an image in a desired way.

#### Students Above Minimum Requirement Level

Students working above the minimum requirement level should be praised and their achievements recognized. They should be encouraged to continue working hard and not become complacent.

#### Students Below Minimum Requirement Level

Students working below the minimum requirement level will require extra help if they are to catch up with the rest of the class. They should be given extra attention in class and additional lesson time during breaks or at the end of the day.

# GLOSSARY

## A

**Absolute Reference:** Commonly used in spreadsheet applications, it is a formulated cell reference that will not adjust when used to calculate the sum of specific cells.

**Access:** A database program which is a part of the Microsoft Office suite of programs.

**Address Book:** In e-mail, list of regular contacts' addresses held in the e-mail software.

**AI (Artificial Intelligence):** It is the branch of computer science concerned with making computers behave like humans.

**Alignment:** Positioning of text according to the margins and baseline.

**Analog:** It is any fluctuating, evolving, or continually changing process that represents data by measurement of a continuous physical variable.

**Animation:** The display of a sequence of images in a computer program or on a Webpage to give the impression of movement.

**Application Software:** A program that is designed to perform specific tasks.

**ASCII:** American Standard Code for Information Interchange. It is pronounced (as-kee).

**Attachment:** An attachment can be a file of almost any kind—a document file, an image file, a sound file or a video clip—that we can add, *i.e.*, attach, to an email.

## B

**Backup:** To copy files or data to a second source or media so as to safeguard it.

**Bandwidth:** A measurement of how much data (bits per second) can be sent through a connection.

**BCD:** Binary Coded Decimal.

**Binary:** A basic numbering system consisting of 1s and 0s.

**BIT (Binary DigIT):** It is the smallest unit of processing of computerized data in terms of 1s or 0s.

**Blog:** (Slang term for a Weblog) A blog is a personal journal that can be accessed publicly and allow people to comment on the previously posted comments.

**Bluetooth:** A wireless networking technology using radio waves that enables user to send data and voice signals between devices over short distances.

**BMP (Bitmap):** It is a standard uncompressed format for Microsoft Windows and IBM OS/2.

**Boolean Searching:** Boolean searching is built on a method of symbolic logic developed by *George Boole*, a 19th century English mathematician. Most search engines support Boolean searches.

**Bootling:** Starting a computer by loading the operating system into memory.

**Broadband:** A general term used to describe a high-speed connection to the Internet.

**Browser:** Software program that allows the user to find and read encoded information in a form suitable for display especially on World Wide Web.

**Byte:** A combination of 8 bits to represent computer data transfer or data storage measurement.

## C

**Cell:** Intersection of a row and column in a worksheet.

**CD-ROM (Compact Disc Read-Only Memory):** A durable and low cost circular optical storage device widely used to store large amounts of information.

**Clipart or Clip Art:** A collection of image files that can be embedded or inserted into Web pages, word-processed documents, PowerPoint presentations, etc.

**Compiler:** A type of system software that translates a source program usually written in a high level language into a machine language.

**Computer:** An electronic device that accepts, processes, stores and outputs data under the control of a set of instructions.

**Computer Laboratory:** A special place where computers are kept to operate.

**Computer Program:** A set of instructions that the computer carries out to perform a given task.

**Copy, Cut and Paste:** Techniques of duplicating or removing data from one place and inserting it elsewhere.

**Copyright:** New technologies have raised all kinds of new issues relating to copyright—mainly because it has become so easy to copy materials from a variety of digital sources.

**Cropping:** The process of removing portions of an image to create focus or strengthen the composition.

**CPU (Central Processing Unit):** A processor on an IC chip (called a microprocessor) that serves as the ‘brain’ of the computer.

**Cursor:** A movable, blinking symbol that indicates the position on a computer screen where user action is needed.

## D

**Data:** A collection of raw facts and figures or a raw input which when processed or arranged makes meaningful output.

**Database:** A structured collection of data that can be used for a variety of purposes.

**Data Communications:** The moving or sharing of encoded information between two or more data sources using an electronic medium.

**DBMS (Database Management System):** Application software which enables the storage, modification, retrieval, and querying of data in a database.

**Debug:** To test a program and remove all the bugs (errors).

**Defragmenter Utility Program:** It finds all the scattered files on the hard disk and reorganizes them as contiguous files.

**Desktop:** The primary display screen of a graphical user interface, on which various icons represent files, groups of files, programs, which can be moved, accessed, added to, deleted, etc. on a real desk.

**Desktop Publishing (DTP):** Application software for laying out text, graphics and pictures in order to produce a professional-looking publication.

**Digital:** A system that defines data in a discrete, non-fluctuating (*i.e.*, non-analogue), numerical digits, specially 1s or 0s.

**Digital Device:** A device that works with discrete numbers or digits.

**Disk Fragmentation:** The scattering of portions of files about the disk in nonadjacent areas, thus greatly slowing access to the files.

**Disk Cleanup Utility:** It can search for and remove unnecessary files such as temporary files, or “temp files”.

**Directory:** An organizing unit in a computer’s file system for storing and locating files. In a hierarchical file system, directories can contain subdirectories as well as files.

**Distribution List:** Also called a mailing list, is a collection of e-mail addresses that allows you to e-mail multiple people at one time.

**Domain Name System:** An addressing system in which abbreviations are used to indicate the type of organization or entity instead of whole name, for example, .edu for educational institution.

**DSS (Decision Support System):** A computer-based information system that provides a flexible tool for analysis and helps managers focus on the future.

**Downloading:** It means transmitting data from a remote computer to a local computer, as from a website to your own PC.

**DVD:** Digital Versatile Disc or Digital Video Disc.

**Dynaset:** Set of records returned by a query.

## E

**E-Commerce:** Buying and selling or business transaction conducted on the Internet.

**Electro Static Discharge (ESD):** The release of static electricity when two objects come into contact.

**E-Mail:** Stands for Electronic Mail. This is a system of relaying messages across the Internet, from one Internet user to another.

**Encryption:** A system of coding that helps prevent access to private information on computer networks or on the Web.

**EPROM:** Erasable Programmable Read-Only Memory (“ee-prom”). It is a memory chip whose contents can be erased by a mechanism using ultraviolet light and reprogrammed for other purposes.

**Ergonomics:** The study of the interaction between people and machines.



**ESS (Executive Support System):** An easy-to-use Decision Support System made especially for top managers; it specifically supports strategic decision making.

## F

**Flash Player and Flash Professional:** Software produced by Adobe for the development and viewing of animated and interactive sequences on the Web.

**Firmware:** A microprogram stored in read-only memory (ROM), designed to implement a function that had previously been provided in software.

**Folder:** An alternative word for a directory and which has become more common since the introduction of Windows.

**Forms:** Used to provide an easy to use interface for user to enter, view and modify data in a table.

**Format:** The arrangement of data for computer input or output, such as the number and size of fields in a record or the spacing and punctuation of information in a report. It is also to prepare a disk for reading and writing.

**Format Painter:** Helps to copy the format that has been applied to text and apply it to another.

**Freeware:** This is a shortened version of Free Software. Programmers offer their work without wanting pay in return.

**FTP (File Transfer Protocol):** A software protocol for exchanging information between computers over a network.

## G

**GIF (Graphics Interchange Format):** It is pronounced "jif", supports upto 256 colours (8 bits per pixel).

**Gigabyte (GB):** 2 to the 30th power (1,073,741,824) bytes. One gigabyte is equal to 1,024 megabytes.

**GIGO:** It is an acronym that stands for Garbage In, Garbage Out.

**Google:** A popular search engine.

**GUI (Graphical User Interface):** A program interface that takes advantage of the computer's graphics capabilities to make the program easier to use. Well-designed graphical user interfaces can free the user from learning complex command languages.

## H

**Hacker:** A person who spends his/her time trying to gain access to information stored on other people's computers all around the world.

**Hardcopy or Hard Copy:** Printed output from a computer, as opposed to output on screen.

**Hardware:** The physical equipment used in a computer system, such as the CPU, peripheral devices and memory.

**Home Page:** The initial page of a site on the World Wide Web.

**HTML:** Hypertext Markup Language. It is a collection of structuring and formatting tags used to create Web pages.

**HTTP (Hyper Text Transport Protocol):** The standard protocol for transferring hypertext documents on the World Wide Web.

**Hyperlinks:** A word or graphic display on one web page that allows a computer to shift to another related web page.

**Hypertext:** A method of storing data through a computer program that allows a user to create and link fields of information at will and to retrieve the data non-sequentially.

## I

**Icon:** A picture or symbol to represent a command on a computer screen.

**IC:** Abbreviation for Integrated Circuit.

**ICT:** Information and Communication Technology.

**IDE (Integrated Development Environment):** A programming environment integrated into an application.

**Image Processing:** The set of computational techniques for analyzing, enhancing, compressing, and reconstructing images, generally with a digital computer.

**Information:** Meaningfully organized data.

**Information System:** A system that provides information to people in an organization.

**Input:** Anything that goes into a computer in order to be processed and/or stored.

**Input Device:** A device that allow people to put data into the computer in a form that the computer can use. For example, keyboard.

**Internet Explorer:** A browser produced by the Microsoft Corporation and supplied together with the Windows operating system.

**Integrated Circuit (IC):** A circuit of transistors, resistors, and capacitors constructed on a single semiconductor wafer or chip, in which the components are interconnected to perform a given function.

**Interface:** This is any type of point where two different things come together. Most often, the term is used to describe the programs between you and your computer like Windows, UNIX and others. What you see on the screen is the interface between you and what your computer is doing.

**Interpreter:** It translates and executes source program, written in high level language, statement-by-statement.

**Internet:** The Internet is a network of networks all of which use the same set of communications protocols.

**Intranet:** A private network for communications and sharing of information that, like the Internet, is based on TCP/IP but is accessible only to authorized users within an organization. An organization's intranet is usually protected from external access by a firewall.

**ISP (Internet Service Provider):** A company that provides access to the Internet.

**IT (Information Technology):** The development, implementation, and maintenance of computer hardware and software systems to organize and communicate information electronically.

## J

**JAVA:** A high-level programming language developed by Sun Microsystems.

**Joystick:** A device that looks a bit like a gear lever in a car. This is connected to a computer and is used mainly for controlling the cursor in fast action games.

**JPEG (Joint Picture Experts Group):** It is pronounced "jay peg". It supports 16.7 million colors (24 bits per pixel).

## K

**Keyboard:** An input device which is used to enter information which the computer displays or processes.

**Kilobyte (KB):** This is about a thousand bytes of space. In reality, it is two to the 10th power or 1,024 bytes.

## L

**LAN (Local Area Network):** A network that links together computers and peripheral equipment within a limited area, such as a building or a group of buildings.

**Language Processor:** Software that converts a high level language or assembly language code into machine understandable form.

**Laptop Computer:** A computer that is light and can easily be carried around.

**Laser Printer:** A type of printer that produces high-quality output at a reasonable speed.

**LCD (Liquid Crystal Display):** A method of displaying readings continuously using a liquid-crystal film, sealed between glass plates that changes its optical properties when a voltage is applied.

**Linker:** A program specifically designed to combine or link together a large number of programs forming a single executable instruction set for these programs that can be loaded into the systems memory for quick execution.

**Login:** To attach to a computer using the user's ID.

**LOGO (Logic Oriented, Graphics Oriented):** A high level programming language specifically designed for its ease of use and graphics capabilities.

## M

**Mainframe:** Second largest computer available after the supercomputer.

**Megabyte (MB):** About a million bytes of space. Actually it is 2 raised to the 20th power or 1,048,576 bytes of space.

**Memory:** Internal storage areas in the computer.

**Microcomputer:** A category of computer that is generally used for personal computing, for small business computing, and as a workstation attached to large computers or to other small computers on a network.

**Microprocessor:** An integrated computer circuit that performs all the functions of a CPU.

**Microsoft Office:** A suite of programs produced by Microsoft Corporation, comprising a Word-processor (Word), a Spreadsheet (Excel), a Presentation Program (PowerPoint), an Email package (Outlook), a Database program (Access), and a Desktop Publishing package (Publisher).

**MIS (Management Information System):** A computer-based information system that uses data recorded by Transaction Processing System as input into programs that produce routine reports as output.



**MODEM:** Stands for MOdulator and DEModulator. It is a device that changes data from digital (computer language) to analog (phone line language) and then back again.

**Motherboard:** The main circuit board of a microcomputer.

**Monitor:** The screen on which output from a computer is displayed.

**Mouse:** A pointing device that is used by moving it around on the desk and pressing (clicking) a button.

**MPEG (Motion Picture Experts Group):** A format to make, view, and transfer both digital audio and digital video files.

**MS-Access:** Database application software, provided by Microsoft.

**MS-Excel:** Spreadsheet application software, provided by Microsoft.

**MS-PowerPoint:** Presentation software, provided by Microsoft.

**MS-Word:** Word processing application software, provided by Microsoft.

**Multimedia:** The integration of two or more types of information (text, images, audio, video, animation, etc.) in a single application.

## N

**Nanosecond:** A billionth of a second. Many computer operations, such as the speed of memory chips, are measured in nanoseconds. Nanosecond is often abbreviated as ns.

**Navigation:** It is the process of finding the way, *i.e.*, navigating, around a series of menus within a computer program or finding the way around the World Wide Web by means of a browser.

**Netiquette:** The rules of etiquette that apply when communicating over computer networks, especially the Internet.

**Network:** A system containing any combination of computers and its peripherals, used to transmit or receive information.

**Newsgroup:** An online discussion community found on the USENET system. These groups cover thousands of different topics of information and are offered free of charge.

**Node:** In networks, a processing location. A node can be a computer or some other device, such as a printer.

**Notebook Computer:** A type of Laptop Computer, but lighter and thinner—and therefore easy to carry around.

## O

**OAS (Office Automation System):** It combines various technologies to reduce the manual labour required in operating and efficient office environment.

**Offline:** Not connected to a computer or network of computers.

**Online:** Connected to a computer or network of computers, especially the World Wide Web.

**Operating System:** A system software program that works as a bridge between computer hardware and the user. Operating systems perform basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk, and controlling peripheral devices such as disk drives and printers.

**Outlook:** A popular e-mail program, part of the Microsoft Office suite of programs.

**Output:** Anything that comes out of a computer after being processed.

**Output Device:** A device that translates information processed by the computer into a form that humans can understand.

## P

**PDA (Personal Digital Assistant):** A handheld device that combines computing, telephone/fax, and networking features and serves as an organizer for personal information.

**PDF (Portable Document Format):** A technology developed by Adobe and was designed to capture all of the elements of a printed document and place it in a single image file.

**Pen Drive:** A secondary storage device that can be used to easily transfer files between USB-compatible systems.

**Peripheral:** Any external device attached to a computer.

**Pixel:** The smallest element of an image that can be individually processed in a video display system.

**Plotter:** A computer output device that draws images on paper using a pen.

**Podcasts:** Online broadcasts that can be downloaded to portable devices.

**Portal:** A Webpage, website or service that acts as link or entrance to other websites on the Internet.

**Printout:** Anything produced on a printer after being processed by a computer program.

**Primary Key:** A set of one or more values in a database that uniquely identifies a record in a table.

**Primitives:** The LOGO commands are known as 'Primitives'.

**Procedure:** The sequence of actions or instructions to be followed in solving a problem or accomplishing a task. It may be used at one or more points in a computer program.

**Processor:** A device that processes programmed instructions and performs tasks. The speed at which the CPU processes information internally is measured in MegaHertz (MHz) and GigaHertz (GHz). 1 GHz is equal to 1,000 MHz.

**Programmable Read-Only Memory (PROM):** A special memory chip that is blank when first purchased. It can be written to by the user by using a special hardware program. Once the data is written to it, it cannot be erased or changed.

**Protocol:** A set of rules governing the format of messages that are exchanged between computers.

**Public Domain:** Material that is copyright free, whose copyright has expired, or which cannot be copyrighted.

## Q

**Query:** Used to retrieve information on a certain condition from a database.

## R

**RAM (Random Access Memory):** A volatile computer memory available to the user for the temporary storage and manipulation of data.

**Relative Reference:** The default reference in a spreadsheet package.

**Reports:** Used to present data in a printed format.

**Resolution:** A measure of the number of pixels or small dots displayed on a computer display screen, printer or scanner.

**ROM (Read-Only Memory):** A memory in which program instructions, operating procedures, or other

data are permanently stored, generally on electronic chips during manufacture, and that ordinarily cannot be changed by the user or when power is switched off.

**Router:** A device in a network that handles message transfers between computers.

## S

**Scroll Bar:** A widget found in graphical user interface and used to show and control which portion of a document is currently visible in a window. A window may have a horizontal or, vertical scroll bar, or both.

**Scanner:** A device used to convert hard copy, *e.g.*, a printed page, photograph or photographic negative, into a form that can be stored on a computer.

**Screen Saver:** A moving picture or pattern that appears on the screen when you have not used the mouse or keyboard for a specified period of time.

**Scroll:** To move up and down or from side to side through a document or a Window to view or access all of its contents.

**Search Engines:** A computer program that searches documents, especially on the World Wide Web, for a specified word or words and provides a list of documents in which they are found.

**Serial Port:** A port or interface that can be used for serial communication, in which only 1 bit is transmitted at a time. Most serial ports on personal computers conform to the RS-232C or RS-422 standards.

**Server:** This is a mainframe computer that serves the other computers attached to it.

**Sheet Tab:** In spreadsheet applications, this refers to a tab at the bottom of a worksheet that acts as a means to identify or access different sheets within a workbook.

**Slide Show:** Used to display the slides in a desired sequence.

**SMS (Short Message Service):** A popular wireless service that is used for sending and receiving short messages up to a maximum of 160 characters. The service is used for text messaging between cell phones that are on a GSM (Global System for Mobile) network.

**Software:** The set of instructions used to direct the operation of a computer, as well a documentation giving instructions on how to use them.



**Social Networking:** The grouping of individuals or organizations into specific groups.

**Source Code:** Program code written in a high level language.

**Source data:** Data for which the chart is prepared.

**Spam:** The disruptive unwanted messages, especially commercial messages posted on a computer network or sent as e-mail.

**Spreadsheet:** A document which helps to organize data in rows and columns that intersect to form cells.

**Supercomputer:** High-capacity computer with thousands of processors that is the fastest calculating device ever invented.

**Switch:** In networks, a device that filters and forwards packets between LAN segments.

**Syntax:** Grammatical rules and structural patterns governing the ordered use of appropriate words and symbols for issuing commands, writing code, of a programming language.

**System:** Collection of related components that interact to perform a task in order to accomplish a goal.

**System Software:** It is a set of master programs that keeps the computer system working.

## T

**Task bar:** The bar that contains the start button and appears by default at the bottom of the desktop.

**TCP/IP:** Acronym for Transmission Control Protocol/Internet Protocol, the suite of communications protocols used to connect hosts on the Internet.

**Technology:** It is the usage and knowledge of tools, crafts, techniques, or systems, or methods of organizations.

**Terabyte (TB):** 2 to the 40th power (1,099,511,627,776) bytes.

**TIFF (Tagged Image File Format):** It stores compressed files with a flexible number of bits per pixel.

**TPS (Transaction Processing System):** A computer-based information system that tracks the transactions needed to conduct business.

**Toolbar:** A row or rows of buttons on a display screen that are clicked on to select various functions in a software application or web browser.

**Topology:** In networking, this refers to the physical or logical arrangement of a network.

**Touch-sensitive Screen:** A display screen which enables the computer to react to the touch of a finger.

**Transistor:** A semiconductor device that amplifies, oscillates, or switches the flow of current between two terminals by varying the current or voltage.

**Trojan:** A type of computer virus that is loaded into an unsuspecting users system via a host program such as a free game.

**Turtle:** A triangular shape pointer used in LOGO that helps in drawing figures.

**Twitter:** A microblogging facility that allows users to post very short texts (maximum 140 characters) containing snippets of information about what they are doing at a given moment, news items, links to websites or comments on events.

## U

**UNICODE:** Binary coding scheme that uses 2 bytes (16 bits) for each character. It allows almost all the written languages of the world to be represented using a single character set.

**Uploading:** It means transmitting data from a local computer to a remote computer, as from your PC to a website you are constructing.

**UPS (Uninterruptible Power Supply):** It is a backup power unit that provides continuous power when the normal power supply is interrupted.

**URL (Uniform Resource Locator):** A protocol for specifying addresses on the Internet. It is an address that identifies a particular file on the Internet, usually consisting of the protocol as http, followed by the domain name.

**User:** Someone attached to a server or host.

**User-friendly:** Mainly used to describe software. Software that is easy to use and offers guidance if the user does silly things is described as user-friendly.

**Utility Program:** A program developed to run within an Operating System to perform a specific service.

## V

**Videoconferencing or Video Conferencing:** A computer-based communications system that allows a group of computer users at different locations to

conduct a “virtual conference” in which the participants can see and hear one another as if they were in the same room participating in a real conference.

**Virus:** A program or piece of code that is loaded onto your computer without your knowledge and runs against your wishes.

## W

**W3C (World Wide Web Consortium):** An international non-profit organization which acts as a resource centre for the World Wide Web, and is active in setting technical standards.

**WAN (Wide Area Network):** A network in which computers are connected to each other over a long distance, using telephone lines and satellite communications.

**WAV:** Stands for WAVeform sound format. Microsoft’s format for encoding sound files.

**Webcam:** A camera connected to a computer and linking it to the Internet.

**Web page or Webpage:** A single, usually hypertext document on the World Wide Web that can incorporate text, graphics, sounds, etc.

**Web server:** A computer that runs specific software to serve web pages to the Internet.

**Web site:** A connected group of pages on the World Wide Web regarded as a single entity, usually maintained by one person or organization and developed to a single topic or several closely related topics.

**Wizard:** A utility that provides guided sequence to perform complex task easily and quickly.

**Wifi:** Wireless Fidelity, also known as wireless networking, a way of transmitting information without cables that is reasonably fast and is often used for laptop computers within a business or school campus instead of a Local Area Network (LAN) that uses cable connections.

**Wikis:** Webpages that can be viewed and modified by anyone with a Web browser and Internet access.

**Word Processor:** Software that processes textual matter and creates organized documents.

**Workstation:** The computer attached to the Internet.

**WWW (World Wide Web):** Series of servers or computers that are interconnected through hypertext.

**WYSIWYG:** What You Say Is What You Get.

## X

**XML (eXtensible Markup Language):** It is a markup language, not limited to Web documents.

## Y

**YouTube:** A website to which we can upload our own video clips and view video clips uploaded by others: <http://www.youtube.com>.

## Z

**Zip Disks:** The disks with a special high-quality magnetic coating that have a capacity of 100, 250 or 750 megabytes.

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