COMPUTER STUDIES

Introduction

Computer Studies is offered as an optional subject at the secondary school level of educatio The syllabus was first developed in 1996 and the subject, being dynamic requires that th syllabus be reviewed constantly. This edition is therefore a revision.

The computer studies syllabus has undergone a major review to bring it up-to date with curre trends and breakthrough in information and communication Technology (ICT). It is th intention of this revised syllabus to be time-independent and to accommodate contemporar technology. This is clearly reflected in the objectives. The aim of the computer studies cours is to equip the learner with basic ICT skills that will enable him/her to use ICTs fc accomplishing day-to-day tasks at school, home and in the world of work. It is the intention c this revised syllabus to give the learner the required knowledge, skills and attitudes to enabl him/her to fit and adapt to the ever-changing technology world and appreciate the ICT as a toc for tackling day-to-day problems.

The syllabus has been revised to enable the learner apply skills acquired to develop mentally morally, socially and spiritually. The learner will also appreciate career opportunities that exis in the world of technology and also have a firm foundation for further education and training.

Teachers are advised to use contemporary technology, materials and resources in order t expose the leaner to the advancements made in the field of ICTs. The teacher should tak particular note of new software and hardware developments and should keep themselves up to date with new innovations. The introduction of internet technology will be particularly useful a a source of information for issues such as HIV/AIDS, drug abuse environment issues, huma rights and integrity among others.

Time allocation per topic has been suggested. It is based on three lessons per week in form one and two and four lessons per week in forms three and four. The teacher is advised to pla his/her work to fit the allocated time in order to cover the syllabus. In teaching subject, a lot o creativity and innovative ideas are encouraged in-order to make the subject interesting.

General Objectives

This Course Will Enable The Learner To:

1. appreciate a computer system.
2. appreciate the technological development of computers
3. apply basic skills in the safe use and care of a computer system
4. develop skills to use application packages
5. appreciate the role of computer applications in carrying out day to-day business and organizational tasks
6. understand the role of information and communication technology in mental, moral, social and spiritual development
7. develop abilities to interact more efficiently with the wider community
8. appreciate the use of programming as a tool for problem solving
9. appreciate the use of programming as a tool for problem solving
10. appreciate the impact of computer technology on society
11. acquire basic knowledge, skills and attitudes necessary for adapting to a fast changing technology world
12. develop a firm base for further education and training

Form One

1.0.0 INTRODUCTION TO COMPUTERS (18 Lessons)

1.1.0 Specific Objectives
By the end of the topic, the learner should be able to:
a) define a computer
b) state the different parts of a computer
c) explain how computers have developed
d) classify the various types of computers
e) identify areas where computers are used
f) define a computer laboratory
g) state the safety precautions and practices in a computer laboratory
h) demonstrate basic hands-on skills on the use of a computer.

1.2.0 Content

1.2.1 Definition of a computer
1.2.2 Parts of computer
1.2.3 Development of computers
1.2.4 Classification of computers
- Physical size
- Functionality
- Purpose

1.2.5 Areas where computers are used

1.2.6 Definition of a computer laboratory

1.2.7 Safety precautions and practices in a Computer laboratory
- Behaviour
- Handing of materials and equipment
- Fire
- Cabling
- Stable power supply
- Burglar proofing
- Ventilation
- Lab layout
- Dust/damp control
- Lighting
- Standard furniture

1.2.8 Hands-on skills
- Start-up, restarting and shut-down(booting)
- Keyboard layout
- Practical Keyboard and mouse skills

2.0.0 COMPUTER SYSTEMS (49 lessons)

2.1.0 Specific objectives
By the end of the topic, the learner should be able to:
a) describe a computer system
b) explain the functional organization of the elements of a Computer system
c) describe input devices of a computer system
d) describe the central processing unit (CPU)
e) describe the output devices of a computer system
f) describe the output devices of a computer system
g) distinguish between power and interface cable
h) explain basic computer set-up and cabling
i) describe the types of secondary storage devices and media
j) distinguish between system software and application software
k) evaluate the criteria for selecting a computer system.

2.2.0 Content

2.2.0 Description of a Computer system

2.2.2 Functional organization of the elements of a Computer System.
- Hard ware
- Software
- Live-ware

2.2.3 Input devices e.g.
- Keying devices
- Pointing devices
- Scanning devices
- Speech recognition devices
- Other digital devices

2.2.4 Central Processing Unit (CPU)
- Control Unit
- Arithmetic and Logic Unit (A.L.U)
- Memory
- Processors
  a. types
  b. clock speeds

2.2.5 Output Devices
- Soft copy output devices e.g.

i) Visual display unit - Liquid Crystal Display (LCD, flat panel, cathode ray tube (CRT)
ii) Sound output
iii) Light emitting diodes (LED)
- Hard copy output devices e.g.
  a. Printers (impact, non-impact)
  b. Plotters

2.2.6 Secondary/auxiliary Storage Devices and Media
  a. Fixed - e.g. Hard disk
  b. Removable e.g.
  i) floppy disks
  ii) tape
  iii) optical disks (CD-R, WORM, CD-RW,DVDs)

2.2.7 Power and interface Cables
- Power Cable
- Parallel cable
- Serial cable

2.2.8 Basic computer set-up and Cabling
- Connecting basic computer components
- Connecting other computer peripherals

2.2.9 Classification of software
a) System software
- firmware
- networking software
- operating system
- utilities

b) Application software
- Acquisition
  a. Standard software (Off the shelf)
  b. User developed (in-house)

2.2.10 Criteria for selecting a Computer system (specifications)
Hardware Considerations
- processor speed
- memory capacity
- warranty
- user needs
- cost
- portability
- other considerations

Software considerations
- Authenticity
- User needs
- User friendliness

Software considerations
- authenticity
- user needs
- user friendliness
- system requirements
- cost
- compatibility
- portability
- documentation
- other software considerations

3.0.0 OPERATING SYSTEMS (32 LESSONS)

3.1.0 Specific objectives

By the end of the topic, the learner should be able to:

a) define an operating system
b) state the functions of an operating system
c) describe types of operating systems
d) describe how operating systems organize information
e) Manage files using an operating system
f) Manage disks using an operating system
g) identify internal and peripheral devices under operating system control
h) Install and configure an operating system

3.2.0 Content

3.2.1 Definition of an operating system

3.2.2 Functions of an operating system
- Job scheduling
- Resource Control
- Input/output handling
- Memory management
- Error handling
- Interrupt handling

3.2.3 Types of operating Systems
- Number of users
  i) Single user
  ii) Multi user
- Number of tasks
  i) Single tasking
  ii) Multi tasking
- Interface
  i) Command line
  ii) Menu driven interface
  iii) Graphical User Interface (GUI)

3.2.4 Organization of Information using an Operating System
- Files
- Directories /folders
- Storage media

3.2.5 File management using an Operating system
- Description of files
- Types of files
  i) system files
  ii) application files
- Functions of files
  i) storage of data
  ii) organization of information
- Manipulating files
  i) viewing files and directories
  ii) organizing of information
  iii) creating files/directories
  iv) opening
  v) editing
  vi) renaming
  vii) finding/searching
  viii) sorting
  ix) copying
  x) moving
  xi) deleting

3.2.6 Disk Management using an Operating system
- Formatting
- Partitioning
- Defragmentation
- Disk Diagnostics
- Disk Compression
- Back up

Software considerations
- authenticity
- user needs
- user friendliness
- system requirements
- cost
- compatibility
- portability
- documentation
- other software considerations

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  - viii) sorting
  - ix) copying
  - x) moving
  - xi) deleting

3.2.6 Disk Management using an Operating system
- Formatting
- Partitioning
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- Disk Diagnostics
- Disk Compression
- Back up

3.2.7 Devices under Operating System Control

- Processor
- Memory (RAM)
- Storage devices
- Input/output devices and ports
- Communication devices and ports

32.7 Installation and Configuration of an Operating system

- Trouble shooting

Form Two

4.0.0 APPLICATION PACKAGES

4.1.0 Word Processors
4.2.0 Spreadsheets
4.3.0 Databases
4.4.0 Desktop publishing
4.5.0 Internet and E-mail

4.1.0 WORD PROCESSORS (18 LESSONS)

4.1.1. Specific objectives
By the end of the topic, the learner should be able to:
a) define a word processor
b) state the purpose of word processing
c) Use a word processing package
d) Format and edit a document
e) Create and edit a table
f) Create and update a mail-merge document
g) Print a document
h) Insert and edit objects.

4.1.2 Content

4.1.3 Definition of a word-processor

4.1.4 Purpose of word processing e.g.
- Letter preparation
- Reports
- Newsletters

4.1.5 Using a Word processing package
- Getting started
- Screen layout
- Running the programme

i) Creating a document
ii) Saving
iii) Retrieving
iv) Closing
v) exiting

4.1.6 Editing and formatting a documer
- Editing a document

- Block options
  - selecting

iii) moving
iv) copying
v) deleting
vi) inserting and type over

- Find and Replace

i) search/find
ii) replace

- Proof-Reading

i) spelling and grammar checking
ii) thesaurus
iii) auto-correct
iv) undo and redo

- Formatting a document

a) Text formatting
i) bolding
ii) italicizing
iii) underlining
iv) fonts
v) drop caps
vi) change case
vii) superscript/subscript

b) Paragraph formatting
i) alignment
ii) indenting
iii) spacing
iv) section breaks
v) bullets and numbering

c) Page formatting

- Layout

i) columns
ii) headers/footers

- Setup

i) margins
ii) orientations
iii) paper size
iv) tabs

4.1.7 Creating and Editing a Table

- Create a table
  - i) rows
  - ii) columns
- enter data
- Editing tables
  - i) resizing rows/columns
  - ii) inserting rows/columns
  - iii) deleting/rows columns
  - iv) merging rows/columns
  - v) splitting rows/columns

- Formatting tables
  - i) borders
  - ii) shading

- Table conversations
  - i) converting text to table
  - ii) converting tables to text
  - iii) importing

- Arithmetic calculations
  - i) perform calculation
  - ii) insert formulae

- Sorting

4.1.8 Sorting Creating and updating a mail merge document

- Creating main document
  - i) form letters
  - ii) labels
  - iii) envelopes
- Create/import data source
  - i) editing
  - ii) saving
- Merging fields
- Main and data source to
  - i) printer or
  - ii) new window or
  - iii) fax or
  - iv) e-mail
- Updating merged document

4.1.9 Printing a document

- i) printer setup
- ii) print preview
- iii) print option
  - printer selection
  - orientation
  - page and copies
- iv) Printing

4.1.10 Inserting Graphics

- Types of graphics
  - i) drawing
  - ii) pictures
  - iii) charts

- Inserting
  - i) importing
  - ii) drawing

- Editing graphical objects
  - i) updating
  - ii) resizing
  - iii) enhance

4.2.0 SPREAD SHEET (18 LESSONS)

4.2.1 SPECIFIC OBJECTIVES

By end of the topic, the learner should be able to:

a) define a spreadsheet
b) describe the components of a spreadsheet
c) state the application areas of a spreadsheet
d) create and edit a worksheet
e) explain different cell data types
f) apply cell referencing
g) apply functions and formulae
h) apply data management skills
i) apply charting and graphing skills
j) print worksheet and graph

4.2.2 Content

4.2.3 Definition of a Spreadsheet

4.2.4 Components of a spreadsheet
- i) worksheet
- ii) database
- iii) graphs

4.2.5 Application areas of a spreadsheet
- statistical analysis
- accounting
- data management
- forecasting (what if analysis)
- scientific application

4.2.6 Creating a worksheet/workbook
- Getting started
- Worksheet layout
- Running the program

i) creating a worksheet
ii) editing a cell entity
iii) saving
iv) retrieving
v) closing a worksheet
vi) exiting from spreadsheet

4.2.7 Cell Data types
- Labels
- Values
- Formulae
- Functions

4.2.8 Cell referencing
- Cell addressing
- Absolute referencing
- Relative referencing

4.2.9 Basic functions and Formulae
- Functions
  - i) statistical (average, count, max, min)
  - ii) logical (if, count-if, sum-if)
  - iii) mathematical (Sum, Product, Div)
- arithmetic formulae (using operations+,-,/,*,

4.2.10 Worksheet formatting
- Text
- Numbers
- Rows and columns
- Global

4.2.11 Data Management
- Sorting
- Filtering
- Total/subtotals function
- Forms

4.2.12 Charts/graphs
- Types
- Data ranges
- Labels
- Headings and titles
- Legends

4.2.12 Printing
- i) Page set-up
- ii) Print preview
- iii) Print options
- Select printer
- Selection
- Worksheet/workbook
- Orientation
- Pages and copies
- iv) Printing

4.3.1 **DATABASES (18 LESSONS)**

4.3.2 **Specific Objectives**
By the end of the topic, the learner should be able to:
a) define a database
b) explain the concepts of database
c) explain data organization in a database
d) create a database
e) edit a database
f) design a form
g) apply basic concepts of queries
h) create report and labels
i) print queries, forms and reports

4.3.3 **Content**

4.3.4 Definition of Database

4.3.5. Database concepts
- Traditional filing methods (manual and flat files)
- Functions of databases
- Types of database models
- Database software
- Features of a database (e.g. data structure, report generating query language, modules

4.3.6 Data Organization
- Character types
- Fields
- Records
- Files
- Database

4.3.7 Creating a Database
- Design a database structure
- Field properties and data types
- Key-fields and index
- Data entry

4.3.8 Editing a database
- Modifying structure
- Updating database

4.3.9 Form Design
- Form layout
- Data manipulation
- Formatting fields

4.3.10 Queries
- Creating
- Updating
- Viewing
- Printing

4.3.11 Reports layout
- Creating (using rational and logical operator, logical operators – AND, OR, NOT)
- Modifying
- Sorting and grouping
- Labeling
- Printing

4.4.0 DESKTOPPUBLISHING (DTP) 15 LESSONS

4.4.1 Specific Objectives
By the end of the topic, the learner should be able to:
a) define desktop publishing
b) state the purpose of DTP
c) identify types of DTP software
d) design a publication
e) edit a publication
f) format a publication
g) print a publication

4.4.2 **Content**

4.4.3 Definition of Desktop Publishing

4.4.4 Purpose of DTP
- Graphic design
- Page layout design
- Printing

4.4.5 Types of DTP software
- Graphic based
- Layout based

4.4.6 Designing a Publication
- Types of publication e.g. newsletters, cards, brochures, posters.
- Running the program
- Screen layout
- Setting up a publication
- Manipulating text and graphics

4.4.7 Editing a publication
- Editing tools

4.4.8 **Formatting a Publication**
- Text
- Graphics

4.4.9 Printing
- Page set up
- Print options

4.5.0 **INTERNET AND E-MAIL (14 LESSONS)**

4.5.1 **Specific Objectives**

By the end of the topic, the learner should be able to:

a) define internet
b) explain the development of internet
c) explain the importance of internet
d) describe internet connectivity
e) identify internet services
f) access internet
g) use e-mail facilities
h) state the moral social and spiritual issues that may emerge through access to the internet

4.5.2 **Content**

4.5.3 Definition of Internet

4.5.4 Development of Internet

4.5.5 Importance of Internet

4.5.6 Internet Connectivity
- Telecommunication facilities
- Moderns
- Internet services providers (ISP)
- Internet software

4.5.7 Internet services e.g.
- World Wide Web (www)
- Electronic mail (e-mail)
- Electronic Commerce (e-commerce)
- Electronic Learning (e-learning)

4.5.8 **Accessing Internet**
- Log-in/sign-in
- Surf browse
- Search engines and hyperlinks
- Downloading/saving/printing

4.5.9 Electronic Mail (e-mail)
- Definition
- e-mail software
- e-mail facilities

i) mails(checking, Composing, forwarding, sending, saving and printing)
ii) fax
iii) file attachment
iv) on-line meetings
v) Telephone messages
vi) Contact management

N.B Emphasis is on the procedure and not necessarily on on-line connectivity

4.5.10 Use the internet to access information on emerging issues e.g.
- HIV and AIDS
- Drug abuse
- Environmental issues
- Moral integrity

5.0.0 DATA SECURITY AND CONTROLS (6 LESSONS)

5.1.0 Specific Objectives

By the end of the topic, the learner should be able to:

a) define the terms data security and privacy
b) identify security threats on ICT and possible control measures
c) identify types of computer crimes
d) discuss laws governing protection of information and communication technology systems

5.2.1 Definition of data security and privacy

5.2.2 Security threats and control measures
- Threats e.g.
  i) virus
  ii) unauthorized access
  iii) computer errors and accidents
  iv) theft
- Control measures e.g.
  i) anti-virus software
  ii) password
  iii) user access levels
  iv) backup

5.2.3 Computer crimes e.g.
i) trespass
ii) backing
iii) tapping
iv) cracking
v) piracy
vi) fraud
vii) sabotage
viii) alteration
- Detection and/Protection e.g.
  i) audit trail
  ii) data encryption
  iii) log files
  iv) fire walls

5.2.4 Laws governing protection of information systems.

Form Three

6.0.0 DATA REPRESENTATION IN A COMPUTER (26 LESSONS)

6.1.0 Specific Objectives

By the end of the topic, the learner should be able to:

a) explain concepts and reasons for data representation in a computer
b) define the terms bit, byte, nibble and word
c) explain types of data representation in the computer
d) perform binary arithmetic operations

6.2.0 Content

6.2.1 Concepts and reasons of data representation

6.2.2 Definition of terms bit byte, nibble and word

6.2.3 Types of data representation
Number Systems and their representation of integral values
- i) decimal
- ii) binary
- iii) octal
- iv) hexadecimal

- Symbolic representation
  - i) Binary coded Decimal code (BCD)
  - ii) Extended Binary Coded Decimal Interchange Code(EBCDIC)
  - iii) American Standard Code for Information
  - iv) Interchange Code (ASCII)
- Conversion between binary and decimal

6.2.4 Binary arithmetic operations
- Binary addition
- Binary subtraction
  - i) ones complement
  - ii) twos complement

7.0.0 DATA PROCESSING (24 LESSONS)

7.1.0 Specific Objectives

By the end of the topic, the learners should be able to:

a) define the terms data, information and data processing
b) describe data processing cycle
c) explain the various methods of data processing
d) explain types of errors in data processing
e) describe data integrity
f) describe a computer file
g) describe types of computer files
h) describe file organization methods
i) describe the various data processing modes

7.2.0 Content

7.2.1 Definition of the terms data information and data processing

7.2.2 Data processing cycle
- Data collection
  - i) stages of data collection
  - ii) methods of data collection
- Data input
- Processing
- Output

7.2.3 Description of errors in data processing
- Transcription errors
- Transposition

7.2.4 Data Integrity
- Accuracy
- Timeliness
- Relevance

7.2.5 Data processing methods
- Manual/conventional
- Mechanical
- Electronic

7.2.6 Computer files
- Elements of computer file
- Logical and physical files

7.2.7 Types of computer processing files
- Master
- Transaction
- Report
- Sort
- Backup
- Reference

7.2.8 File organization methods
- Sequential
- Random/direct
- Serial
- Indexed sequential

7.2.9 Electronic Data processing modes
- On-line
- Distributed
- Time-sharing
- Batch processing
- Multi-processing
- Multi-programming/multi-tasking
- Interactive processing
- Real-time

8.0.0 ELEMENTARY PROGRAMMING PRINCIPLES (38 LESSONS)

8.1.0 Specific Objectives

a. define programming
b. describe the various levels of programming languages.
c. state the advantages and disadvantages of each level of the programming language
d. define the terms assembler, compiler, interpreter, source program and object program
e. describe the stages of program development
f. describe the program control structures
g. define and develop algorithm, pseudo-code and flowchart.

8.2.0 Content

8.2.1 Definition of Programming
8.2.2 Levels of programming languages
- Low level language
  i) machine
  ii) assembly
- High level languages
  i) Third generation languages (3GLs)
  ii) For generation Languages (GLs)
  iii) Object Oriented Programming (OOPs)
  iv) Internet (scripting) Programming languages

8.3.3 Advantages and disadvantages of low and high level languages

8.4.4 Description of terms
- i) assembler
- ii) compiler
- iii) interpreter
- iv) source program
- v) object program

8.4.5 Program development
- Problem recognition
- Problem definition
- Program design
- Program coding
- Program testing
- Implementation

8.4.6 Program Control Structures
- Sequence
- Selection
- Iteration (looping)

8.4.7 Definition and development of Algorithm e.g.
- i) Pseudo-code
- ii) Flow chart

9.0.0 SYSTEM DEVELOPMENT (44 LESSONS)

9.1.0 Specific objectives

By the end of the topic, the learner should be able to:
- a) describe a system
- b) define an information system
- c) state the purpose of an information system
- d) identify the stages of system development
- e) develop a system using a case study
- f) write a report on the case study

9.2.0 Content

9.2.1 Description of a system

9.2.2 Definition of an Information system

9.2.3 Purpose of an Information System

9.2.4 Stages of system development
- Problem recognition and definition
- Information gathering e.g.
  - i. investigation
  - ii. observation
  - iii. interviews
  - iv. questionnaires
- Requirement specification for the new system
- System design
- System construction
- System implementation
- System review and maintenance

(*A number of theories exist on system development. The above is a general guide to the stages.)

9.2.5 System Documentation
- Reports on fact finding/information gathering
- System flowchart
- Table file structure/descriptions
- Sample data
- Output reports
- User manual

Form Four

10.00 INTROUDCTION TO NETWORKING AND DATA COMMUNICATION (24 LESSONS)

10.1.0 Specific Objectives

By the end of the topic, the learner should be able to:

a) define computer networking terms
b) state the purpose of computer networks
c) describe the elements of a network
d) describe various types of networks
e) describe various types of network topologies

10.2.0 Content

10.2.1 Definition of terms
- i) computer network
- ii) data communication

10.2.2 Purpose and Limitations of networking
- Purpose
  - i) resource sharing
  - ii) remote communication
  - iii) distributed processing facilities
  - iv) cost effectiveness
  - v) reliability
- Limitations

10.2.3 Elements of Networking

a) Data Communication media
- Communication with cables
  - i) twisted pair cable
  - ii) coaxial cables
  - iii) fibre-optic cables
- Communication without cables (wireless) e.g.
  - i) microwave
  - ii) satellite
  - iii) radio transmission

b) Data Signal
- digital
- analog

c) Communication Devices e.g.
- Modems
- Net work cards
- Hubs

d) Network software
- Operating systems
- Protocols

10.2.4 Types Networks
- Local area Network (LAN)
- Metropolitan area Network (MAN)
- Wide area Network (WAN)

10.2.5 Types of Network topologies e.g.
- Ring
- Star
- Bus

11.0.0 APPLICATION AREAS OF INFORMATION AND COMMUNICATION TECHNOLOGY (8 LESSONS)

11.1.0 Specific Objectives

By the end of the topic, the learner should be able to:

a) describe the use of computers in different application areas
b) write a report on the use of a computer in any one of the application areas visited by students.

11.2.0 Content

11.2.1 Application Areas of Information and Communication Technology

- Financial system
  - i) accounting
  - ii) banking
  - iii) payroll
- Retail systems
  - i) point of sale systems
  - ii) stock control
- Reservations Systems
  - i) hotels
  - ii) air-lines
- Communication Systems
  - i) fax and telex
  - ii) radio
  - iii) television
  - iv) video conferencing
  - v) e-mail
  - vi) telecommunicating
  - vii) internet
- Education
  - i) Computer Aided Learning (CAL)
  - ii) e-learning
  - iii) Computer based Simulation (CBS)
- Industrial systems
  - i) Stimulation
  - ii) Process
  - iii) CAD (Computer aided Design/CAM (Computer Aided Manufacturer)
- Scientific and Research Systems
  - i) weather forecasting
  - ii) medical research
  - iii) military/space exploration
- Transportation systems
  - i) air-traffic control
  - ii) shipping control
  - iii) automobile traffic control
- Entertainment systems
  - i) computers and movies
  - ii) multi-media
- Virtual reality
  - i) uses of virtual reality
  - ii) virtual reality equipment e.g. visor, gloves, suits
- Library systems e.g. Library lending system
- Home use
- Health expert systems
- Offices expert systems
- Marketing
  - i) e-commerce
  - ii) business

11.2.2 Field Report

12.0.0 IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON SOCIETY (8 LESSONS)

12.1.0 Specific Objectives

By the end of the topic, the learner should be able to:

a) identify issues resulting from the use of ICT
b) discuss future trends in ICT.

12.2.0 Content

12.2.1 Issues resulting from use of ICT

a) Effects on employment
- job creation
- job replacement
- job displacement

b) Automated production
- Pros & cons

c) Issues of workers health

d) Breakthrough
- health care
- education
- communication
- research
- commerce
- arts
- entertainment
- transport

e) Cultural effects
- computer crimes
- moral effects

12.1.2 Evolution of computer systems
- Possible future trends in capabilities e.g. physical size, price, software
- Artificial intelligence
  i) expert systems
  ii) natural language processing
  iii) artificial neural networks
  iv) robotics

13.0.0 CAREER OPPORTUNITIES IN ICT (4 LESSONS)

13.1.0 Specific Objectives

By the end of the topic, the learner should be able to:

a) describe career opportunities in ICT
b) identify available opportunities for further education

13.2.0 Content

13.2.1 Description of careers in the field of ICT e.g.

i) Computer Operators
ii) Programmers
iii) Software Engineers
iv) Database Administrators
v) System Administrators
vi) Computer Technicians
vii) Computer systems Managers
viii) Computer Trainers
ix) Web Designers
x) Web Administrators
xi) Systems analyst

13.2.2 Identification of further Educational opportunities

i) Colleges
ii) Institutions
iii) Polytechnics
iv) Universities
v) Research Institutions

14.0.0 PROJECT (50 LESSONS)

14.1.0 Specific Objectives

By the end of the Project, the learner should be able to:

a) identify and define a problem
b) carry out fact finding through either or all of these methods
   i) investigation
   ii) observation
   iii) interviews
   iv) questionnaires
c) define system hardware and software requirements
d) design a system
e) construct a system that would:
   i) input data through forms or screen
   ii) update modification, deletion of existing data
   iii) carry out data validation
   iv) search filter/query/retrieve records
   v) generate /print reports
f) test the system
g) prepare a project report (documentation) that includes user manual, technical manual, test data.

GENERAL REQUIREMENTS

i) Schools intending to offer Computer Studies are expected to have the following minimum equipment.
ii) Computer Laboratory classroom(s)
iii) Computer desks that accommodate monitor at eye level
iv) At least one computer per every four students(1:4)
v) At least one printer for every four computers(1:2)
vi) Printing Stationery
vii) Appropriate storage devices e.g. Memory sticks, CD-RWs
viii) Storage facilities for Memory sticks, CD-RWs e.g. DVD jackets
ix) Appropriate software for the curriculum
x) relevant reference materials

Note that computers to be used for the course should preferably be IBMs or IBM compatibles due to their low maintenance costs and availability of spare parts

In addition to the above, the following facilities though not mandatory will greatly assist in achieving the objectives of the course.

1 **HARDWARE**

i) The PCs should be Pentium II or higher\
ii) The PCs SHOULD HAVE CD-ROM drive
iii) At least <u>one</u> of the PCs in the school should be fully multi-media
iv) A networked environment
v) Internet connectivity

Printers with graphic capabilities (not necessarily in colour)

2. **SOFTEWARE**

i) It is recommended though not necessary that the operating system be a Graphical User Interface (GUI)
ii) Software for the application packages may also be GUI-based which supports pointing devices

iii) An up to date anti-virus software is highly recommended
iv) Suggested teaching methods

Suggested Teaching Methods

- Educational Visits
- Lectures
- Practicals
- Demonstration
- Discussions
- Simulations software e.g. downloaded websites, games
- Questions and answers
- Computer aided learning software e.g. typing tutor, training tutors

Suggested Learning/Teaching Resources

- Internet
- On-line help
- Simulation software
- Photographs/slides
- Videos an shows
- Journals/Newspapers
- Books
- Realia (real life experience)

Suggested Assessment Methods

Recommended methods of assessment that will help achieve the objectives include:

- Practical exercises in classroom (to enhance skills)
- Short answer quizzes(to test recall of technical terms
- Assignments that will involve discussions or further reference from resource materials
- End-term exams similar to final exams offered by KNEC
- Case studies guided by the teacher.

Time Allocation - Summary

FORM 1 TOPICS	Lessons
Introduction to computers	18
Computer systems	49
Operating systems	32
FORM 2 TOPICS	
Word Processors	18
Spreadsheets	18
Databases	18
Desktop publishing	15
Internet and e-mail	14
Data security and controls	6
FORM 3 TOPICS	
Data representation in a computer	26
Data processing	24
Elementary Programming principle	38
Systems development	44
FORM 4 TOPICS	
Introduction to Networking and data communication	24
Application areas of ICT	8
Impact of ICT in society	8
Career opportunities in computer field	4
PROJECT	50