GENERAL INFORMATION

Programme Nomenclature:

National Vocational Certificate in COMPUTER STUDIES

Goal: The Vocational Computer Studies Certificate is designed to produce enterprising and self-reliant personnel in computer operations.

Objectives: A product of NVC in Computer Science should be able to:

1. Understand the computer environment and posses skills needed to use common software packages in a very competent manner in the business and industrial sector.
2. Operate and maintain basic Operating Systems
3. Install and run common software
4. Input and retrieve data from databases
5. Detect minor technical faults in a Computer
6. Carry out routine (preventive) maintenance of Computer facilities.
7. Start and manage a small computer-based business

Entry Qualifications

- Nine years of basic education (3 years of Junior Secondary and school leaving certificate) is the minimum requirement for entry Or
- Special consideration may be given to sponsored candidates with lower academic qualification Or
- Candidates (matured) who are computer literate have good aptitude capable of benefiting from the programme.

NATIONAL CERTIFICATION

Trainees who successfully completed all the courses/modules specified in the curriculum table and passed the national examinations in the trade will be awarded the following certification:

- A National Vocational Certificate (NVC).
- This programme is expected to be in form of term/session-based training courses of not less than 3 months/term and 9 months/session, in three Session Modules, NVC Part I, NVC Part II and NVC Final.

ACCREDITATION

- The Certificate programme shall be accredited by the National Board for Technical Education before the candidates can be awarded the National Vocational Certificates (NVC).
- Details about the process of accrediting a programme for the award of the NVC can be obtained from the *Executive Secretary, National Board for Technical Education, Plot "B", Bida Road, P.M.B. 2239, Kaduna, Nigeria*

GUIDANCE NOTES FOR TEACHERS

- The new curriculum is drawn in unit courses and modules.
- In designing the units, the principle of the modular system has been adopted, thus making each of the professional modules, when completed, enough to provide the student with operative skills, which can be used for employment purposes or otherwise.
- Institutions may, as required, add courses to the minimum guide curriculum
- The teaching of the theory and practical work should, as much as possible, be integrated. Practical exercises, especially those in professional courses and laboratory work should not be taught in isolation from the theory. For each course, there should be a balance of theory to practical in the ratio of 20:80

CURRICULUM STRUCTURE

The curriculum of all NVC programmes consists of main components. These are:

- General studies/education
- Trade courses
- Supervised Industrial Attachment

The General Education component may include courses in

- English Language/Communications
- Mathematics &
- Entrepreneurship

Trade Courses are courses, which give the student the theory and practical skills he needs to practice his field of calling at the technical level. The component shall account for a minimum of 60% of the total contact hours for the programme.

Supervised Industrial Attachment shall be taken during the middle or end of the session of the each year. The component shall account for 20% of total contact hours for the programme.

NVC Programmes DURATION

- 3 parts, each for one year
- 6 hours per day or 30 hours per week
- 14 weeks per term (2 weeks for evaluation and registration)

CURRICULUM TABLE FOR NVC IN COMPUTER STUDIES

1st Term NVC Computer Studies Part I

S/N	Course Code	Course Title	L	T	P	CU	CH	Prerequisite
1.	VCS 111	Introduction to Computer	2	0	3	3	5	
2.	VCS 112	Typing Skill I	1	0	3	3	4	
3.	VCS 113	Basic Computer Electronics	2	0	3	3	5	
4.	VCS 114	Computer Package I (MS Word)	2	0	3	3	5	
5.	VCS 115	Computer System Troubleshooting I	2	0	3	3	5	
6.	CSK 103	Grammar	2	0	0	2	2	
	TOTAL						**26**	

CSK- in NVC Communication Skills.

2nd Term NVC Computer Studies Part I

S/N	Course Code	Course Title	L	T	P	CU	CH	Prerequisite
1.	VCS 121	Computer Installation & Maintenance	2	0	2	3	4	
2.	VCS 122	Computer Package II (MS Excel)	2	0	2	3	4	
3.	VCS 123	Computer Operations and Data Processing	2	0	2	2	4	
4.	VMT 011	Number and Numeration	2	1	0	2	3	
5.	VCS 124	Computer Package III (CorelDraw)	2	0	2	3	4	
6.	VCS 125	Computer Package IV (MS Publishing)	2	0	2	3	4	
7.	EDP 101	Elements of Entrepreneurship I	1	0	1	2	2	
	TOTAL						**25**	

VMT- in NVC Mathematics Courses

EDP- in NVC Entrepreneurship

3rd Term NVC Computer Studies Part I

VCS 131:Industrial Training (3 months)

1st Term NVC Computer Studies Part II

S/N	Course Code	Course Title	L	T	P	CU	CH	Prerequisite
1.	VCS 211	Typing Skill II	1	0	2	3	3	
2.	VCS 212	OO BASIC Programming I	2	0	2	3	4	
3.	VCS 213	Computer Package V (Power Point)	1	0	2	3	3	
4.	VCS 214	Web Design and Development I (HTML & XML)	1	0	2	2	3	
5.	VCS 215	Data Communication	2	0	2	3	4	
6.	VCS 216	Multimedia	1	0	2	3	3	
7.	VCS 217	Fundamentals of Internet Technology	2	0	2	3	4	
8.	VMT 012	Algebra and Geometry	2	0	0	3	2	
	TOTAL						**26**	

2nd Term NVC Computer Studies Part II

S/N	Course Code	Course Title	L	T	P	CU	CH	Prerequisite
1.	VCS 221	Auto CAD	2	0	2	3	4	
2.	VCS 222	Photoshop	1	0	2	3	3	
3.	VCS 223	Computer Package VI (MS Access)	1	0	2	2	3	
4.	VCS 224	Database Management I (Structured Query Language)	2	0	2	3	4	
5.	VCS 225	Computer System Troubleshooting II	1	0	2	3	3	
6.	VCS 226	Web Design & Development II (PHP)	2	0	2	3	4	
7.	VCS 227	Basic Networking	2	0	2	3	4	
8.	EDP 102	Elements of Entrepreneurship II	1	0	1	2	2	
	TOTAL						**26**	

3rd Term NVC Computer Studies Part II

VCS 231:Industrial Training (3 months)

1st Term NVC Computer Studies Final

S/N	Course Code	Course Title	L	T	P	CU	CH	Prerequisite
1.	VCS 311	Typing Skill III	1	0	3	3	4	
2.	VCS 312	Database Design	2	0	2	3	4	
3.	VCS 313	Database Management II (Oracle)	2	0	2	3	4	
4.	VCS 314	Ethics and Practice in IT	1	0	2	2	3	
5.	VCS 315	Computer Graphics and Animation	2	0	2	3	4	
6.	VCS 316	OO BASIC Programming II	2	0	2	3	4	
7.	CSK 301	Correspondence	2	1	0	2	3	
	TOTAL						**26**	

2nd Term NVC Computer Studies Final

S/N	Course Code	Course Title	L	T	P	CU	CH	Prerequisite
1.	VCS 321	Computer Package VII (Front Page)	2	0	2	3	4	
2.	VCS 322	Operating Systems	2	0	2	3	4	
3.	VCS 323	Management Information System	2	0	2	2	4	
4.	VCS 324	Web Design and Development III (Java Script)	2	0	2	3	4	
5.	VCS 325	Computer Systems Management	2	0	2	3	4	
6.	EDP 103	Elements of Entrepreneurship III	1	1	1	2	3	
	TOTAL						**23**	

3rd Term NVC Computer Studies Final

VCS 331:Industrial Training (3 months)

PROGRAMME:	NVC IN COMPUTER SCIENCE
MODULE:	INTRODUCTION TO COMPUTER
CODE:	VCS 111
DURATION:	HOURS/WEEK Lecture: 2hrs Tutorial: 0 Practical: 3hrs
UNITS:	3 Units

GOAL: This module is designed to introduce the leaner to the equipment used for electronics data processing.

GENERAL OBJECTIVES: On completion of this module the leaner should be able to:

1. Know the computer and identify its classification.
2. Understand the impact and role of computer in modern society
3. Know the hardware and software elements of a computer
4. Understand the EDP environment
5. Know the importance of security within computer environment
6. Know data/file security and control
7 Understand the basic principles of Data Transmission
8 Know how to use the keyboard (Typing skills)

	Theoretical Content			**Practical Content**		
	General Objective 1.0: Know computer and identify its classifications.					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Define computer in relation to data and information. 1.2 Explain types of computer. 1.3 Classify computers according to: (a) usage and (b) size 1.4 Distinguish between analogue, digital and hybrid computers. 1.5 Identify the various types of microcomputers. 1.6 Operate the keyboard	• Explain the concept of computer in relation to data and information. Identify types of computers List and explain the classes of computers according to usage and sizes. • Differentiate between the various types of computer listed in 1.4	1 Magic board 2 Charts/posters 3 Computer systems 4 Typing first course test book 5 Typing tutor software 6 Multimedia Projector. 7 External Storage Devices.	Start up and shut down the computer Identify and use the various icons on the menu bars and toolbars for specific appropriate functions	Supervise activity	Magic board Charts/posters Computer systems Typing first course text book Typing tutor software Multimedia Projector External Storage Devices.
	General Objective 2: understand the impact and role of computers in modern society					
2	2.1 List the uses of computers in our society 2.2 Explain the social implications of computers on society. 2.3 List the characteristics and benefits to the society. 2.4 Explain the various application of computer to the society. 2.5 Operate the keyboard.	• Drill learners in keyboard mastering	Magic board Charts/posters Computer systems Typing first course test book Typing tutor software	Demonstrate how to operate the keyboard.	Drill learners in keyboard mastering Assign Topics on Computer in modern society.	

	General Objective 3: know computer hardware and software elements					
3- 4	3.1 Identify parts of a computer system 3.2 Explain and identify different hardware available and their functions 3.3 Describe hardware configuration 3.4 List some input and output units 3.5 Describe the functions of the output units 3.6 Explain the functions of CPU 3.7 Describe the functions of some auxiliary memory units 3.8 Define: nibbles, bites, words and storage size in terms of 'k' 3.9 Define and list various types of software 3.10 Distinguish between low and high level languages. 3.11Define source and object codes 3.12Define a translator 3.13 Describe different types of translators: assembler, compiler and interpreters. 3.14Operate the keyboard.	• Identify various hardware components and explain their functions. Identify and explain auxiliary functions • Differentiate between system and application software Explain the difference between high and low level languages. • Identify source and object code Explain translator and show examples • Identify different types of translators: assemblers, compilers and interpreters Drill learners in keyboard mastering	Complete Computer systems	Demonstrate understanding of basic hardware and software elements	Supervise activity	Complete Computer systems
	General Objective 4: Understand the EDP					
5-6	4.1Describe organisational structure of EDP environment 4.2 Define computer file 4.3 Explain the purpose of computer files 4.4 Describe the elements of a file 4.5 List types of files 4.6 Explain file organization and	Explain the Organogram of an EDP environment and describe their functions. Discuss the concept of computers Using question and answer technique, explain information and the concept	Pictures/Posters Computer system Magic board Lesson note, etc.	Show how to master the use of keyboard	Show how to master the use of keyboard	Computer system

	Access methods 4.7 Identify storage media devices 4.8 Describe processing activities 4.9 Explain vulnerability b of files i) Improper / fraudulent input ii) Software / programme abuse 4.10 Master the use of keyboard	of information technology. Define 'computer file' and explain the purpose; characteristics; types and organisation Describe sequential, random and direct access methods Describe storage media devices and state their functions Explain processing activities and give examples Discuss the vulnerability of files Ask questions and give note to student Drill students into keyboard mastering				
	General Objective 5: Know importance of security within the computer environment					
7-8	5.1 Explain standard operating procedures of a computer centre 5.2 Explain the need for computer room security 5.3 Describe computer system auditing 5.4 Explain prevailing safety regulations in computer centre 5.5 Describe methods of preventing hazards (fire, flooding, sabotage, etc.)	List and explain standard operating procedures of a computer installation. State the need for computer security in the computer room. Explain the various safety regulations applicable to computer centre. Enumerate methods whereby hazards could be prevented in computer room.	Pictures/Posters Computer system Magic board Lesson note, etc.	Demonstrate effect of insecurity in computer systems.	Supervise activity.	Computer system

	General Objective 6: **Know Data/File Security and control**					
9-10	6.1 Explain data security and control, Manual Data preparation control, Validation checks. 6.2 Explain file security and control. 6.3 Describe file security methods in computer installations 6.4 Explain the need for file security in computer installation. 6.5 Explain the user password and user name. 6.6 Explain computer virus. 6.7 State the various sources of viruses 6.8 Describe ways of protecting file from infection and getting rid of computer virus.	• Use question and answer • List methods of file security in omputer installation and explain the need for file security in computer installation • Define 'user password' and 'user name' • Describe computer virus and identify: i) Their possible sources ii) Ways of getting rid of them iii) Ways of preventing the computer from contaminating viruses iv) Ways of protecting file from virus infection	Lesson note Magic board Deployment of anti-virus suite.	Infect a computer with a virus. Clean virus from computer.		Complete Computer system.
	General Objective 7: Understand the basic principles of Data transmission					
11	7.1 Define data transmission 7.2 Explain the term telecommunication 7.3 State different methods of data transmission 7.4 Define computer Network 7.5 State types of Network	• Explain data transmission • Explain the term 'telecommunication'	Internal/External modem Example of Network cad, Network cables	Identify different methods of data transmission	Describe different methods of data transmissio n	DO

	7.6 State advantages of Network 7.7 Identify equipment necessary for data transmission 7.8 Explain communication software	• Define network • Explain the differences between LAN and WAN • Discuss the advantages of Network • Describe modem, network cad etc. • List some existing communication softwares such as Lab link, TCP/IP, etc.				
	General Objective 8: Know how to use keyboard					
12	8.1 Operate the keyboard using: i) Function keys ii) Alpha-numeric keys iii) Numeric keys iv) Control keys 8.2 Carryout typing exercises on the Keyboard	• Explain items in 8.1 • Give a typing assignments to students • Give proficient test on typing skills	• Computer software e.g. Typing tutor	Carryout typing exercises on the Keyboard	Give proficient test on typing skills	DO

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: TYPING SKILL I

CODE: VCS 112

DURATION: HOURS/WEEK Lecture: 1 hrs Tutorial: 0 Practical: 3 hrs

UNITS: 3 Units

GOAL: This module is designed to enable students master the keyboard and carry out sentence drills efficiently.

GENERAL OBJECTIVES: On completion of this module the leaner should be able to:

1.	Know the names and functions of the Basic Computer parts.
2.	Know how to take care of the Computer and understand the preparatory steps to typing.
3.	Understand the keyboard.
4.	Understand various line spacings.
5.	Know how to develop speed using appropriate drills.
6.	Know the various sizes of paper.
7.	Know the correct use of punctuation signs.
8.	Know the rules for line-end division of words.

General Objective 1.0: Know the names and functions of the Basic Computer parts.						
Theoretical Content				Practical Content		
WEEK	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1	1.1 Identify the parts of a computer. 1.2 State the functions of basic computer. parts.	Identify each part of the computer by name. State the functions of the basic computer parts.	Computer, Paper, Text books	1.1 Identify the parts of a computer. 1.2 State the functions of basic computer. parts. 1.3 Demonstrate correct insertion of paper.	Show each part of the computer by name. State the functions of the basic computer parts. Show correct insertion of paper.	Computer, Paper, Text books
General Objective 2.0: Know how to take care of the computer and understand the preparatory steps to typing.						
2	2.1 Describe how to carry a computer. 2.2Explain how to clean the computer. 2.3 Describe how to cover a computer when not in use.	Describe how to carry a omputer. Explain how to clean the computer. Describe how to cover a computer when not in use.	PC Cleaning Materials	Demonstrate: 2.1 Carrying a computer. 2.2 Clean the computer. 2.3 Cover a computer when not in use. 2.4 Correct sitting position. 2.5 Preliminary steps taken before typing. 2.6 Insert a backing sheet.	Demonstrate the proper manner of carrying a computer. Demonstrate how to clean the computer. Demonstrate how to cover a computer after use. Demonstrate correct sitting/typing position. Emphasize grooming of nails. Observe students and revaluate. Teacher to inform the students to report faults promptly. Demonstrate how a backing sheet is inserted before	PC Cleaning Materials

					typing.	
General Objective 3.0: Understand the keyboard.						
3 – 5	3.1 Explain how to operate the home keys while keeping eyes on the copy. e.g. - (ASDFG, HJKL;) 3.2 Type exercises based on home keys.	Explain how to operate the home keys while keeping eyes on the copy. e.g. (ASDFG, HJKL) Type exercises based on home keys.	Computer, Paper, Textbooks.	3.1 Operate the Home keys while keeping eyes on the copy. e.g. - (ASDFG, HJKL;) 3.2 Type exercises based on home keys.	Demonstration of Home keys. Observe students at work and correct bad techniques. Give assignments/grade.	Computer, Paper, Textbooks.
	3.3 Explain how to type exercise based on reach keys-up. 3.4 Explain how to type exercise based on reach keys down with eyes on copy. 3.5 Explain how to type exercise based on shift keys using the correct typing	Type exercise based on reach keys-up. Type exercise based on reach keys down with eyes on copy. Type exercise based on shift keys using the correct typing	Computer, Paper, Textbooks.	3.3 Master Reach keys-up (QWERT, YUIOP) 3.4 Type exercise based on reach keys-up. 3.5 Master Reach keys down. (ZXCV, BNM,) 3.6 Type exercise based on reach keys down with eyes on copy. 3.7 Master shift keys. 3.8 Type exercise based on shift	Demonstration of Reach keys up. Observe students at work to ensure the use of correct techniques. Give assignments and grade. Demonstration of reach keys down. Observe students at work in order to correct bad techniques. Give assignment/grade. Demonstrate shift keys. Observe students at work to ensure the correct techniques	Computer, Paper, Textbooks.

	3.6 Explain how to type exercises based on figure keys.	Explain how to type exercises based on figure keys.	Computer, Paper, Textbooks.	keys using the correct typing techniques. 3.9 Master figure keys (1234567890 ½, ¾) 3.10 Type exercises based on figure keys. 3.11 Master special signs keys 3.12 Type exercise (*> >/@-GI[]? 3.13 Type straight c copy materials of 1.3 S.I. 3.14 Consolidate all the keyboards covered.	are used. Give assignments/grade. Demonstrate figure. Observe students at work and evaluate. Demonstrate sign keys Observe student at work and evaluate. Time students for 10 minutes. Give typing materials that cover topics.	Computer, Paper, Textbooks.
General Objective 4.0: Understand various line spacings.						
6 - 8	4.1 Explain how to type varied materials in single line, double, or triple line spacing. 4.2 Explain the use of various line spacing. Provide adequate materials for practice.	Observe students at work and evaluate.	Computer, Paper, Textbooks.	Type varied materials in single line, double, or triple line spacing.	Explain and demonstrate the use of various line spacing. Provide adequate materials for practice. Observe students at work and evaluate.	Computer. Textbooks.

General Objective 5.0: Know how to develop speed using appropriate drills.						
9	5.1 Explain how to type graduated speed drills within a given time. 5.2 Describe how to operate the shift keys and space bar rapidly.	Explain how to type graduated speed drills within a given time. Describe how to operate the shift keys and space bar rapidly.	Computer, Paper, Textbooks.	5.1 Type graduated speed drills within a given time. 5.2 Operate the shift keys and space bar rapidly.	Give appropriate speed passages and grade same. Observe students at work and evaluate.	Textbooks, Computer.
General Objective 6.0: Know the various sizes of papers.						
10	6.1 Describe various sizes of paper e.g. A3, A4, A5, A6. 6.2 Explain the appropriate papers for given jobs.	Describe various sizes of paper e.g. A3, A4, A5, A6. Explain the appropriate papers for given jobs.	Computer, Paper, Textbooks.	6.3 Identify various sizes of paper e.g. A3, A4, A5, A6. 6.4 Select the appropriate papers for given jobs.	List/specify various sizes of paper to students. Ask students to identify different of papers and their sizes.	Various sizes of printing sheets e.g. A3, A4, A5 A6, etc. Textbooks.

General Objective 7.0: Know the correct use of Punctuation signs.						
11	7.1 Explain the space after each punctuation sign.	Explain the space after each punctuation sign.	Computer. Textbooks	7.1 Type materials containing various punctual-signs and spacings	Explain the space after each punctuation sign. Provide materials for practice. Observe students at work and evaluate.	Printing Sheet/ Computer. Textbooks
General Objective 8.0: Know the rules for Line-end Division of words.						
12	8.1 Explain the rules for line-end division of words and their exceptions.	Explain the rules for line-end division of words and their exceptions.	Computer. Textbooks	8.1 Type given jobs dividing word at line-end.	Explain the rules for line-end division of words and their exceptions. Give appropriate materials for practice. Observe students at work and evaluate.	printing Sheet/ computer. Textbooks

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: BASIC COMPUTER ELECTRONICS

CODE: VCS 113

DURATION: HOURS/WEEK Lecture : 2hrs Tutorial: 0 Practical: 3hrs

UNITS: 3 Units

GOAL: This module is designed to enable students to understand the basic principles, construction and application of electronic components, as well as trouble shoot and solve simple hardware problems

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1.0	Know the fundamentals of Boolean algebra
2.0	Know the Logic Gates
3.0	Know the importance of Codes and Code Conversion
4.0	Know the feature of different Transistor Logic Gates (TLG)
5.0	Understand the features and attributes of the different logic families
6.0	Understand the principles of operation and the use of basic electronics measuring instrument.

	Theoretical Content			**Practical Content**		
	General Objective 1: Know the fundamentals of Boolean algebra					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-2	1.1 Define the inverse operation, the AND, and the OR operations 1.2 State the Boolean postulates: The Commutative law, Associate law, Distributive law, Negative law, Redundancy law and De Morgan's Theorem. 1.3 Define a Truth Table.	• Explain the inverse operation to the AND and the OR operations • Explain the Boolean postulates • Discuss the 'Truth Table' • Show example of a Truth Table for up to four variables	• Magic board • Truth table • Lesson note • Computer system • Electronic work bench	Show example of a Truth Table for up to four variables	Show example of a Truth Table for up to four variables	Magic board Truth table Lesson note Computer system Electronic work bench
	General Objective 2: Know the Logic Gates					
3-4	2.1 Describe the action of a diode 2.2 Describe the construction of the AND, and OR gates using diodes 2.3 Illustrate the action of Gates using Truth Tables 2.4 Construct logic diagrams using a combination of Logic Gates 2.5 Convert a Logic expression in AND, OR and NOT Gates into an expression in NAND and NOR Gates 2.6 Construct circuits using NAND and NOR Gates 2.7 Describe the construction of a	• Illustrate the action of a diode • Show the construction of the AND, and OR Gates diodes • Demonstrate the action of Gates using Truth Tables • Develop logic diagrams using a combination of Logic Gates • Explain the process of conversion of AND, OR, and NOT Gates	• Base board • Lead • Soldering Iron • Transistors • Diode	Illustrate the action of a diode Illustrate the action of Gates using Truth Tables Construct circuits using NAND and NOR Gates	Supervise activity	Base board Lead Soldering Iron Transistors Diode

	transistor inverter circuit 2.8 Construct a transistor inverter circuit	into an expression in NAND and NOR Gates • Guide the students to construct a transistor inverter circuit				
	General Objective 3: Know the importance of Codes and Code Conversion					
5-6	3.1 Explain binary number system 3.2 Define a Code 3.3 Describe the BCD Code and ASCII Code 3.4 Describe the conversion from one code to another e.g. from BCD to ASCII codes 3.5 Describe the seven-segment display code	• Demonstrate mathematical operations in binary system • Define and describe a code • Explain the BCD Code and ASCII Code • Demonstrate the process of conversion from one code to another e.g. from BCD to ASCII codes • Show and explain the seven-segment display code	• Computer • Magic board • Lesson note	Demonstrate mathematical operations in binary system Demonstrate the process of conversion from one code to another e.g. from BCD to ASCII codes Show and explain the seven-segment display code		Computer Magic board Lesson note
	General Objective 4: Know the feature of different Transistor Logic Gates					
7-8	4.1 Identify the symbols for different Transistor Logic Gates; AND, OR, NOT, NAND, NOR, the exclusive OR. 4.2 Explain the actions and Truth Tables of different Transistor Logic Gates 4.3 Construct simple circuits with transistors and investigate their characteristics	• Explain the functions of the symbols listed in 4.1 • Explain Truth Tables of Transistor Logic Gates and list their functions • Guide the students to construct simple transistor and	• Magic board • Transistors • Computer system • Lesson note • Base board • ICs • Electronic work • Bench • Wire	Construct simple circuits with transistors and investigate their caracteristics		Magic board Transistors Computer system Lesson note Base board ICs Electronic

	4.4 Apply different Transistor Logic Gates to solve problems.	investigate their characteristics.	• Soldering Iron			work Bench Wire
	General Objective 5: Understand the features and attributes of the different logic families					
9-10	5.1 Explain the characteristics of different logic families e.g. RTL, TTL, and MOS (fan-out, heat dissipation, noise margin, propagation delay). 5.2 Explain some pin arrangement of ICs, Dual in-line (DIL), Straight-line and circular 5.3 Describe attributes of logic families e.g. handling care and voltage tolerance 5.4 Apply different Logic Gates to solve problems.	• Describe the characteristics of different logic families • Describe some pin arrangement of ICs, (DIL), Straight-line and circular • Explain the attributes of logic families • Perform functions of different Logic Gates to solve problems.	- Do -	Perform functions of different Logic Gates to solve problems.	Perform functions of different Logic Gates to solve problems.	Do
	General Objective 6: Understand the principles of operation and use of basic electronics measuring instrument					
11-12	6.1 Explain pin connection and manufacturer' data sheets 6.2 Construct basic circuits using Logic Gates (AND, OR, NOR, NAND, EOR) 6.3 Describe the principles of operation of Multi-Meter and Oscilloscope 6.4 Measure currents, voltage, resistance, capacitance and inductance using Multi-Meter 6.5 Observe and measure pulses using Oscilloscope 6.6 Diagnose faults using Multi-Meter and Oscilloscope	• Describe pin connection and manufacturers' data sheets • Guide the students to construct basic circuits using Logic Gates • State the principles of operation of Multi-Meter and Oscilloscope • Show students how to measure currents, resistance, capacitance and inductance using Multi-Meter • Describe how to measure pulses using Oscilloscope and ask students to perform the operation • Demonstrate the process of fault diagnosing using Multi-Meter and Oscilloscope	Magic Board Multi-Meter Oscilloscope Lesson note Base bar Soldering Iron ICs Electronic work bench Wires	Diagnose fault using Multi-Meter and Oscilloscope	Supervise activity.	Magic Board Multi-Meter Oscilloscope Lesson noteBase bar Soldering Iron Cs Electronic work bench Wires

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER PACKAGE I (MS WORD)

CODE: VCS 114

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 3hrs

UNITS: 3 Units

GOAL: This module is designed to enable students acquire knowledge and skills in Microsoft Word.

GENERAL OBJECTIVES: On completion of this course the students should be able to:-

1. Know how to Create, open and save MS Word documents
2. Know how to Type simple word documents
3. Understand the structure of MS Word software
4. Know the usage and functions of items on the toolbar
5. Know how to Create, edit and format tables in MS Word
6. Know how to Format text and other graphics
7. Know how to Copy, paste and retrieve text from open documents
8. Know how to Copy and retrieve text and graphics to the clipboard
9. Know how to Open, edit and save other MS Office documents with MS Word

	Theoretical Content			**Practical Content**		
	General Objective 1: Know how to Create, open and save MS Word documents					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Explain Booting and Selecting Programmes 1.2 Describe Saving a document 1.3 Explain Opening an existing document	Teacher Shows the students how to switch-on the system and how Computers boot Shows students how to select ALL programmes when the Computer is ready. Illustrates how to select MS WORDS Explain the command which saves a document Save the document you have opened. Explain the command which opens an existing document. Open the document saved in 1.2	Any complete system MS Office Software	Boot and select a programme. Save documents. Open an existing document.	Supervise activities	Any complete system MS Office software

	General Objective 2: Know how to Type simple word documents					
2	2.1 Identify functions of keys and their combinations. 2.2 Type a document	Explain the functions of special keys: SHIFT, ALT, CTRL, BACKSPACE, etc. Lead the students in typing a few paragraphs.	Any complete system MS Office software	Type a simple word document.	Supervise activities	Any complete system MS Office software
	General Objective 3: Understand the structure of MS Word software					
3	3.1 Explain the structure of MS Words Software. 3.2 Explain what tasks can be achieved by MS Words. 3.3 Explain the interactions of MS Words with other Windows	Explain the structure of MS Words Software. Explain what tasks can be achieved by MS Words. Explain the interactions of MS Words with other Windows	Any complete system MS Office software	Show structure of MS Words	Supervise activities	Any complete system MS Office software
	General Objective 4: Know the usage and functions of items on the toolbar					
4	4.1 Explain MS WORDS MENU 4.2 Explain Functions of toolbars	Explain the use of each menu: File, Edit, Insert, Tools, Help, etc. ICON and their equivalents on the keyboard. Explain the functions and use of each of the toolbars	Any complete system MS Office software	Show the use of each menu: File, Edit, Insert, Tools, Help, etc. ICON and their equivalents on the keyboard.	DO	Any complete system MS Office software
	General Objective 5: Know how to Create, edit and format tables in MS Word					
5	5.1 Explain Creating Tables	Explain different ways of creating tables: Insert or Draw from the toolbar. Explain the columns and rows.	Any complete system MS Office software	Create tables. Edit and format tables.	Demonstrate activities 5.1 and 5.2	Any complete system MS Office

	5.2 Explain how to Edit and Format tables	Explain the autofit behavior. Show students how a table can be moved, merged, split etc.				software
	General Objective 6 Know how to Format text and graphics					
6-8	6.1 Explain Formatting Characters and Paragraphs 6.2 Explain Shapes and Graphics 6.3 Explain Borders, Shading, and Graphic Fills. 6.4 Explain Background and Watermarks	Explain the meaning of formatting. Explain the keys that lead to different forms of character formatting: font, italics, etc Explain how to achieve paragraph formatting, Spellings and grammar check. Explain how to insert Headers and Footers, Frames and Frame pages, Page numbers. Explain how to achieve word count etc. Explain how to draw simple shapes: lines, circles triangles , curves, etc. 3-D shapes. Explain how to insert auto shapes, diagrams, pictures and clip arts. Explain how to format such shapes. Explain Groupings of shapes.	Any complete system MS Office software	Format texts, Characters and Paragraphs	Illustrate formatting.	Any complete system MS Office software

		Explain how to insert border on text. Explain how to shades on a text. Explain how to fill graphics with desired colour. Explain how give a background and watermarks to a text				
	General Objective 7: Know how to Copy, paste and retrieve text from open documents					
9	7.1 Explain copying text from an open document. 7.2 Explain Pasting Copied or Cut text.	Explain how to highlight desired text. Illustrate how to Copy highlighted text, by use of toolbar, and use of keyboard. Explain the keys which pastes copied or cut text. Explain how copied text can be pasted from the toolbar	DO	Copy highlighted text, by use of toolbar, and use of keyboard. Cut and paste document portions.	Demonstrate activities	DO
	General Objective 8: Know how to Copy and retrieve text and graphics to the clipboard					
10	8.1 Describe a clipboard. 8.2 Copy text from clipboard	Explain how to copy text from the clipboard.	Any complete system MS Office software	Show how to copy text from the clipboard.	Demonstrate activities	Any complete system
	General Objective 9: Know how to Open, edit and save other MS Office documents with MS Word					
11-12	9.1 Explain how to Open with MS Words	Explain how to open other MS Office documents with MS Words. Explain how to save other edit other MS Office documents with MS Words	Any complete system MS Office software		Demonstrate activity	DO

PROGRAMME:	NVC IN COMPUTER SCIENCE
MODULE:	COMPUTER SYSTEMS TROUBLESHOOTING I
CODE:	VCS 115
DURATION:	HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 3hrs
UNITS:	3 Units
GOAL:	This module is designed to introduce students to knowledge and skills to begin to repair Hardware & software.

General Objectives: On completion of this module the students should be able to:

1. Understand the process of fault diagnosis.
2. Understand the causes of computer start up failure.
3. Understand memory failure symptoms.
4. Understand hard drive failure symptoms.
5. Understand floppy drive failure symptoms
6. Understand CD-ROM failure symptoms.
7. Understand mouse and keyboard failure symptoms.
8. Understand Display system failure symptoms.
9. Understand sound failure symptoms.

	Theoretical Content			**Practical Content**		
	General Objective: 1. Understand the process of fault diagnosis					
Week/s	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-2	1.1 Explain power on self test. 1.2 Describe the process of power fault diagnosis.	Explain how to complete a fault report form Explain the visible and audible codes. Explain how to check the motherboard and other PC components power supply connections.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Complete the fault report form. Specify the POST error Messages. Check the motherboard and other PC components power supply.	To help student: To complete the fault report form. Specify the POST error Messages Check the motherboard and other PC components power supply.	Personal computer loaded with diagnostics packages.
	1.3 Explain the usage of different software diagnostic tests for hardware.	Explain how to use a verity of software diagnostic test.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Identify software diagnostic packages to test hardware.	To help student how to use diagnostic packages.	Personal computer loaded with diagnostics packages.

	General Objective: 2. To understand the causes of computer start up failure					
3-4	2.1 Describe start up failure. 2.2 Identify the causes of start up failure.	Explain: Why the display is on but several beeps heard. Why no beeps were heard, but the POST runs and the system starts up normally with faults. How to take note off the fault message from the screen. Why the power LED is on but nothing else happened. Why the system does not switch on.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Identify and name the type of the faults from hearing the beeps. Identify the type of faults from the error messages. Remedy the fault by taking appropriate hardware/software repair and /or re-instalment.	To help the student to : Identify and name the type of the faults from hearing the beeps. Identify the type of faults from the error messages. Remedy the fault by taking appropriate hardware/software repair and /or re-instalment.	Personal computer loaded with diagnostics packages.
	General Objective: 3. To understand memory failure symptoms					
4-5	3.1 Describe memory failure. 3.2 Explain the cause of memory failure.	Explain how to recognise POST error message code as memory	PC connected to an OHP.	Recognise POST error message code as an indication of a memory problem.	To help student to : Recognise POST error message code as an	Personal computer loaded with diagnostics packages.

		failure. Memory failure remedy.	Power Point presentation of Lectures. On line lecture notes. Smart/White board	Rectify the memory problem by reinsertion or replacement.	indication of a memory problem. Rectify the memory problem by reinsertion or replacement.	
	General Objective: 4. To understand hard drive failure symptoms					
6	4.1 Describe hard drive failure. 4.2 Recognise the cause of hard drive failure.	Explain how to use scandisk software to detect hard drive problems such as Slow disk access and failure to read from hard drive.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a hard drive problem. Rectify the hard drive problem by replacement and/or reformatting.	To help student to : Recognise POST error message code as an indication of a hard drive problem. Rectify the hard drive problem by replacement and/or reformatting	Computer loaded with diagnostics packages.
	General Objective: 5. To understand floppy drive failure symptoms					
7	5.1 Describe Floppy drive failure. 5.2 Recognise the cause of floppy drive failure.	Explain how to use scandisk software to detect floppy drive problems such as Slow disk access and failure to read from floppy disk.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a floppy drive problem. Rectify the floppy drive problem by replacement and/or reformatting.	To help student to : Recognise POST error message code as an indication of a floppy drive problem. Rectify the floppy drive problem by replacement and/or reformatting	Computer loaded with diagnostics packages.

	General Objective: 6. To understand CD-ROM failure symptoms					
8-9	6.1 Explain the cause of CD-ROM drive failure. 6.2 Explain how rectify CD- ROM failure.	Explain how to recognise POST error message code as CD-ROM failure Explain why data cannot be accessed from the CD-ROM drive. Explain why the CD-ROM drive is not registered.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/Whit e board	Recognise POST error message code as an indication of a CD-ROM drive problem. Rectify the CD-ROM drive problem by replacement and/or reformatting	To help student to : Recognise POST error message code as an indication of a CD-ROM drive problem. Rectify the CD-ROM drive problem by replacement and/or reformatting	Personal computer loaded with diagnostics packages
	General Objective:7. To understand mouse and keyboard failure symptoms					
10	7.1 Explain why the mouse/keyboard are not recognise in window. 7.2 Explain why the cursor may be difficult to move. 7.3 Explain why the cursor movements may be jerky. 7.4 Explain why some	Explain why the mouse/keyboard are not recognise in window. Explain why the cursor may be difficult to move. Explain why the cursor movements	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes.	Recognise POST error message code as an indication of a mouse/keyboard problem. Rectify the mouse/keyboard problem by replacement and/or cleaning and part replacement.	To help students to: Recognise POST error message code as an indication of a mouse/keyboard problem. Rectify the	Personal computer loaded with diagnostics packages

	keys may not function properly.	may be jerky. Explain why some keys may not function properly.	Smart/Whit e board		mouse/keyboard problem by replacement and/or cleaning and part replacement.	
	General Objective: **8**. To understand Display system failure symptoms					
11	8.1 Describe computer display system. 8.2 Explain the cause of display system failure.	Explain how to test the monitor connections. Explain how to test monitor power supply. Explain how to test a video card and reseat to check its functionality again. Explain how to replace the video card. Explain how to replace the motherboard if the video card is embedded in the motherboard. Explain how to check :	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/Whit e board	Recognise POST error message code as an indication of a display/graphic card problem. Rectify the display/graphic card problem by replacement and/or part replacement.	To help student to: Recognise POST error message code as an indication of a display/graphic card problem. Rectify the display/graphic card problem by replacement and/or part replacement.	Personal computer loaded with diagnostics packages

		Windows display properties. Display adaptor in device manager.				
	General Objective: 9.To understand sound failure symptoms					
12	9.1 Describe Speakers and sound. 9.2 Explain the cause of sound failure.	Explain how to check Windows volume control, Device conflicts in device manager and Speaker. Explain how to reseat the sound card, replace the sound card and replace the motherboard for embedded sound chips.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a sound card problem. Rectify the sound card problem by replacement and/or part replacement.	To help students to: Recognise POST error message code as an indication of a sound card problem. Rectify the sound card problem by replacement and/or part replacement	Personal computer loaded with diagnostics packages

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER INSTALLATION AND MAINTENANCE

CODE: VCS 121

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical:2 hrs

UNITS: 3 Units

GOAL: This module is designed to acquaint students to begin PC Upgrade & Maintenance

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1. Understand the concept of upgrading and maintenance for PC.
2. Understand the limitation of a PC and scope for upgrading.
3. Understand technical specifications for PC upgrading.

	Theoretical Content			**Practical Content**		
	General Objective: 1.To understand the concept of upgrading and maintenance for PC					
Week/s	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-4	1.1 Explain the need for PC maintenance.	Explain typical hazards threatening the normal operation of PC. E.g. static electricity, power fluctuation, power surge, dusty environment, excessive ambiance temperature, viruses …….. Explain the need for computer backups	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Assess a computer maintenance requirement. Appropriate hardware tools. Protect the computer components from static electricity. Clean computer from dust. Clean the computer systems from the viruses. Perform system backup.	To help: Student with their maintenance assessment of a computer. To choose appropriate hardware tools. How to clean a computer from dust. How to clean a computer from viruses. How to Perform system backup.	Computer hardware and software repair and maintaining tools
	1.2 Explain the need for PC upgrade.	Explain technological changes in	PC connected to an OHP.	Assess the require computing power for a new	To provide advice on student assessment of	Access to a variety of computer

		computer hardware. User demand for a higher processing power. The emergence of complicated software package.	Power Point presentation of Lectures. On line lecture notes. Smart/White board	application software.	new required computing power.	components Internet access to obtain the latest information on hardware and software upgrade.
	General Objective: 2. To understand the limitation of a PC and scope for upgrading					
5-8	2.1 Explain the process of hardware upgrading. 2.2 Explain how to choose hardware components for upgrading.	Explain how to open the case of a PC. Explain how to make a list of components to upgrade. Explain how to get prepared for a component change (obtaining the required hardware/software tools and components). Explain how to check and verify the specifications of	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Open a computer case and identify components for upgrading. List the current computer components specifications. To choose components that matches the new hardware/software requirements. Verify specifications against requirements.	To show student how to: Open a computer case and identify components for upgrading. List the current computer components specifications. To choose components that matches the new hardware/software requirements. Verify specifications against requirements.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade.

		new components against the new requirements.				
	General Objective: 3. To understand technical specifications for PC upgrading					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
9-12	3.1 Explain how to replace the computer case.	Explain how to choose a suitable case which meets specifics requirements. Explain how to dismantle the old computer. Explain how to assemble the upgraded components and the un- upgraded components in the new case.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose appropriate new PC cases which match the new requirements. Assemble and disassemble personal computers.	To provide advise and assistance on choosing computer case. To provide advise and assistance on Assemble and disassemble a personal computers.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer cases.

	3.2 Explain how to replace the computer case.	Explain how to choose a suitable case which meets specifics requirements. Explain how to dismantle the old computer. Explain how to assemble the upgraded components and the unupgraded components in the new case.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose appropriate new PC cases which match the new requirements. Assemble and disassemble personal computers.	To provide advise and assistance on choosing computer case. To provide advise and assistance on Assemble and disassemble a personal computers.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer cases.
	3.3 Explain how to replace the computer power supply.	Explain how to choose a suitable power supply which meets specifics requirements. Explain how to dismantle the old power supply computer. Explain how to assemble the new power supply.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose appropriate new PC power supplies which match the new requirements. Assemble and disassemble computer power supply.	To provide advise and assistance on choosing computer power supply. To provide advise and assistance on Assemble and disassemble a computers power supply.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer power supply.

	3.4 Explain how to replace the computer mainboard.	Explain how to choose a suitable mainboard which meets specifics requirements. Explain how to dismantle the old mainboard computer. Explain how to assemble the new mainboard.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose appropriate new PC cases which match the new requirements. Assemble and disassemble personal computers.	To provide advise and assistance on choosing computer mainboard. To provide advise and assistance on Assemble and disassemble a personal computers.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer mainboard.
	3.5 Explain how to replace the computer CPU.	Explain how to choose a suitable CPU which meets specifics requirements. Explain how to dismantle the CPU. Explain how to assemble the new CPU.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose appropriate new PC cases which match the new requirements. Assemble and disassemble personal computers.	To provide advise and assistance on choosing computer case. To provide advise and assistance on Assemble and disassemble a personal computers.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer CPU.

	3.6 Explain how to replace the computer mass storage.	Explain how to choose a suitable mass storage which meets specifics requirements. Explain how to dismantle the mass storage. Explain how to assemble the new mass storage.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose appropriate new PC cases which match the new requirements. Assemble and disassemble personal computers.	To provide advise and assistance on choosing computer case. To provide advise and assistance on Assemble and disassemble a personal computers.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer mass storage.
	3.7 Explain how to replace the computer display unit.	Explain how to choose a suitable display unit which meets specifics requirements. Explain how to dismantle the display unit. Explain how to assemble the new display unit.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose appropriate new PC cases which match the new requirements. Assemble and disassemble personal computers.	To provide advise and assistance on choosing computer case. To provide advise and assistance on Assemble and disassemble a personal computers.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer display unit.

	3.8 Explain how to replace the computer add-on cards.	Explain how to choose a suitable add-on cards which meets specifics requirements. Explain how to dismantle the old add-on cards. Explain how to assemble the new add-on cards.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose appropriate new PC cases which match the new requirements. Assemble and disassemble personal computers.	To provide advise and assistance on choosing computer case. To provide advise and assistance on Assemble and disassemble a personal computers.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer add-on cards.
	3.9 Explain how to replace the computer keyboard and mouse.	Explain how to choose a suitable keyboard and mouse which meets specifics requirements. Explain how to dismantle the old keyboard and mouse. Explain how to assemble the new keyboard and mouse.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose an appropriate new PC case which matches the new requirements. Assemble and disassemble personal computers.	To provide advise and assistance on choosing computer case. To provide advise and assistance on Assemble and disassemble a personal computers.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer keyboard and mouse.

	3.10 Explain how to replace the computer modems.	Explain how to choose a suitable modems which meets specifics requirements. Explain how to dismantle the old modems. Explain how to assemble the new modems	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Choose appropriate new PC cases which match the new requirements. Assemble and disassemble personal computers.	To provide advise and assistance on choosing computer case. To provide advise and assistance on Assemble and disassemble a personal computers.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade. Sample of different computer modems.

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER PACKAGE II (MS EXCEL)

CODE: VCS 122

DURATION: HOURS/WEEK Lecture: 2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students acquire working skills in Microsoft Excel.

GENERAL OBJECTIVES: On completion of this course the students should be able to:-

1. Know the features of MS EXCEL program
2. Know how to enter data on a spread sheet
3. Know how to perform simple arithmetic operations on a set of data
4. Understand how to cerate a simple chart from a set of data
5. Know how to perform simple statistical operation using built-in functions.
6. Understand how to write a simple formula to perform specific mathematical operation
7. Know how to save, retrieve, edit, print charts arising from a set of data
8. Know how to copy a set of data from a spreadsheet

	Theoretical Content			**Practical Content**		
	General Objective 1: Know the features of MS EXCEL program					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Describe Booting and Selecting MS EXCEL Programmes 1.2 Describe the features of the spreadsheet	Explain how to switch-on the system and how Computers boot Shows students how to select ALL programmes when the Computer is ready. Illustrates how to select MS EXCEL Explain the features of the columns and rows of the spreadsheet. Explain the identities of each CELL in a spreadsheet.	PC loaded with WINDOWS/MS EXCEL	Carryout program loading	Oversee the booting preliminaries	PC loaded with windows/ MS EXCEL

	General Objective 2: Know how to Enter data on a spread sheet					
2	2.1 Explain how to enter data on Cells. 2.2 Explain how to import data from other source 2.3 Explain how to edit data. 2.4 Explain how to format and save data. 2.5 Explain how to sort data in a specific order.	Explain how to enter data on Cells. Explain how to import data from other source Explain how to edit data. Explain how to format and save data. Explain how to sort data in a specific order.	PC loaded with WINDOWS/ MS EXCEL	Enter data in Cells	Oversee the activity of data entry	PC loaded with windows/ MS EXCEL
	General Objective 3: Know how to perform simple arithmetic operations on a set of data					
3	3.1Explain the Arithmetic commands. 3.2 Explain Syntax and Semantics of MS EXCEL	Explain how to obtain the sum of a set of data on one column or one row using auto sum functions Explain the syntax in MS EXCEL Explain how to carry out arithmetic operations using the identity of each Cell. eg. =A1+B2,	PC loaded with windows/ MS EXCEL	Perform simple arithmetic operations in EXCEL	Supervise activities in simple arithmetic operations	PC loaded with windows/ MS EXCEL.
	General Objective 4: Know how to Create a simple chart from a set of data					
4	4.1 Explain how to select a set of data	Explain how to select a set of data for creating charts. Explain range of a set of data.	PC loaded with windows/ MS EXCEL	Select a set of data for charts.	Oversee the selection of data for charts	PC loaded with windows/ MS EXCEL

	4.2 Describe how to creating Charts	Explain how to create charts of different kinds from a set of data either by highlighting the data or by using data range.		Create charts of different forms and dimensions.	Oversee activities in creating charts	
	General Objective 5: Know how to perform simple mathematical operations using built-in functions					
5	5.1 Explain various built-in functions that exist in EXCEL. 5.2 Explain how to activate the functions to achieve specific mathematical operations eg. SDV(1,4,6) etc	Explain various built-in functions that exist in EXCEL. Explain how to activate the functions to achieve specific mathematical operations eg. SDV(1,4,6) etc	PC loaded with windows/ MS EXCEL	Activate the built-in functions for specific operations.	Oversee activities in built-in functions	PC loaded with windows/ MS EXCEL
	General Objective 6 Know how to write a simple formula to perform specific mathematical operation					
6-7	6.1 Describe how to enter simple Formula to perform specific mathematical operations 6.2 Explain how to write formula to execute specific mathematical operations using the data on the sheet. 6.3 Explain how to copy a formula to execute another set of data.	Explain how to write formula to execute specific mathematical operations using the data on the sheet. Explain how to copy a formula to execute another set of data.	PC loaded with windows/ MS EXCEL	Carryout forrmula operations in EXCEL	Oversee activities to execute given mathematical operations	PC loaded with windows/ MS EXCEL

	General Objective 7: Know how to save, retrieve, edit, print charts arising from a set of data					
8-9	7.1 Describe how to format charts arising from data 7.2 Describe how to edit charts 7.3 Describe how to save and retrieve charts	Explain how to format charts to specification Explain how to edit charts to specification save charts and how to retrieve them	System loaded with WINDOWS/ MS EXCEL	Edit, save, and retrieve charts	Oversee activities in formatting etc.	System loaded with WINDOWS/EXCEL
	General Objective 8: Understand how to copy a set of data from a spreadsheet					
10-12	8.1 Explain how to select range of data 8.2 Explain how to copy data from spreadsheet to other files	Explain how select range of data Explain how to copy data from spreadsheet to other files	System loaded with WINDOWS/ MS EXCEL -DO-	Select range of data by Cell reference Copy data from spreadsheet to other files	Supervise activity 8.1 Demonstrate how to copy data from spreadsheet Demonstrate interaction between MS EXCEL and other MS OFFICE	-DO-

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER OPERATIONS AND DATA PROCESSING

CODE: VCS 123

DURATION: HOURS/WEEK Lecture: 2hrs Tutorial: 0 Practical: 2hrs

UNITS: 2 Units

GOAL: This module is designed to provide the leaner with the working knowledge of the operation of the computer.

GENERAL OBJECTIVES: On completion of this module the leaner should be able to:

1. Understand Computer system and Information technology
2. Know the Overview of EDP Environment
3. Know the stages and Methods of preparation in Data Processing
4. Understand Modes of Processing/Operations
5. Know Computer Files
6. Understand File Organization Method
7. Understand Improper/Fraudulent Input/Security of Computer Operations.

PROGRAMME: NVC IN COMPUTER SCIENCE						
COURSE: COMPUTER OPERATIONS AND DATA PROCESSING						
	Theoretical Content			**Practical Content**		
	General Objective 1: Understand Computer Systems and Information Technology					
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
1	1.1 Explain Computer systems. 1.2 Explain computer operating system. 1.3 Explain Information technology.	• Brief Explanation of Computer systems • Define operating system, full definition of I.T. globalization current trends in information and communication teleconferenary technology, teleworking, internet, intranet	Internet lab. Single and multi User laboratory.	Be able to have various ideas about Computer operations in single user, multi user and in a global world.	Assist students by giving assignment and practical demonstration on the internet.	Internet lab. Single and multi User laboratory.
	General Objective 2: Know the Overview of EDP environment (Electronic Data Processing)					
2	2.1 Explain Computer operation concept. 2.2 Define EDP. 2.3 Explain the concept of Data processing, staff, type of staff and functions.	Explain Computer operation concept. Define EDP. Explain the concept of Data processing Staff, type of staff and functions.	White Board Organizational Chart of Data Processing Department	Visit a Data processing Department to know the structure and working method.	Assist students to find Data processing or computing centre in order to know the concept of computer operations.	DO

	General Objective 3: Know the general concepts of Data and Information					
3-4	3.1 Explain the difference between Data and Information. 3.2 Explain the various Data entry and preparation devices. 3.3 Explain the different sources of Data and Information. 3.4 Explain Data Collection procedures. 3.5 Explain Data Encoding and Data Administration. 3.6 State the stages of Data Processing.	Explain the difference between Data and Information Mention and explain the various Data entry and preparation devices. Mention and explain the different sources of Data and information Explain Data collection procedures and Data encoding. Explain various stages of Data processing e.g. collection, gathering, sorting, input, processing output.	Complete PCs.	Identify the stages of Data Processing.	Assignments and Home work on concepts of Data and information.	Complete PCs.
	General Objective 4: Understand Modes of Processing/Operations					
5-6	4.1 List different modes of processing and operation. 4.2 Describe different modes of processing and operations: • Batch Processing • On-line • Time-Sharing • Real – time • Distributed processing • Networking.	Explain the Concept of modes of processing. Highlight and discuss the various modes of processing. Discuss with examples the differences between the mode.	Multi User laboratory. Networked environment	Distinguish between different modes of processing and when is it applicable in a visible computer laboratory.	Be able to assist student to visit organizations that has the categories of modes of operations.	Multi User laboratory. Networked environment
	General Objective 5: Know Computer Files					
7-8	5.1 Define Computer File 5.2 Explain elements of a file 5.3 Identify types of files 5.4 Distinguish between Record and File.	Explain the concept of file. Highlight the elements of files. Discuss various types of file. List the type of operations		Illustrate how relevant the concept of files in Computer operations. Illustrate with any storage devices on how records are stored on files e.g. student	Assist student to carry out assignment on how to store records into file and save it.	DO

		that can be performed on files.		files consisting information about them.		
	General Objective 6: Understand File Organization Method					
9-10	6.1 Define File organization 6.2 Explain different File Organization methods. 6.3 Explain Storage media and devices.	Explain File Organization generally. Explain Different methods of sequential random direct access, Random access Inter sequential file organization. Highlight and explain different types of storage media and devices.	Pictures, poster, computer system Magic board lesson note. e.t.c.	Carryout File Organization in Computer daily operations.	Assist students to by Specific assignment in this concept.	DO
	General Objective 7: Understand Security in Computer Environment					
11-12	7.1 Identify Standard Operating procedures of a Computer Centre. 7.2 Explain the need for Computer Security. 7.3 Explain Vulnerability of files • Improper Fraudulent Input • Software and program Abuse.	List and explain standard operating procedures of computer installation. Explain the need for computer security room. Explain the various safety regulations applicable to computer Centre Enumerate how hazards could be prevented in Computer room.	Computer system Pictures and Poster Practical assignment.	Show how hazards could be prevented in Computer room.	Assist students by giving more assignment in this area. Demonstrate cause/effect of improper/fraudulent input on file system.	DO

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER PACKAGE III (CORELDRAW)

CODE: VCS 124

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students acquire working skills in Corel Draw

GENERAL OBJECTIVES: On completion of this course the students should be able to:-

1. Understand how to Move about and view drawings
2. Know how to Select and format tables
3. Know how to Draw shape and transform objects
4. Know how to Work with artistic text and paragraph text
5. Know how to Outline and fill objects
6. Know how to Use special effects
7. Use symbols and clipart
8. Understand the printing and customizing options and page layouts
9. Understand how to use layers styles and templates
10. Understand how to use Corel trace to trace images and convert bitmap images into vector drawings

	Theoretical Content			**Practical Content**		
	General Objective 1: Understand how to Move about and view drawings					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Explain how to get started with Corel Draw. 1.2 Explain how to move about and view drawings	Illustrate how to get started in Corel Draw 11. Illustrates how to move about drawing.	Any complete system	Illustrate how to get started in Corel Draw 11. Illustrate how to move about drawing.	Supervise activity	Any complete system
	General Objective 2: Know how to Select and format tables					
2	2.1 Explain how to select tables 2.2 Explain how to format tables	Explain how to select tables illustrate how to format tables	Complete systems with Corel Draw 11 packages.	Illustrate how to format tables	DO	Complete systems with Corel Draw 11 packages.
	General Objective 3: Know how to Draw shape and transform objects					
3	3.1 Explain how to draw shapes 3.2 Explain how to transform shapes	Illustrate how to draw shapes Illustrate how to transform shapes	Complete systems with Corel Draw 11 packages.	Illustrate how to draw shapes Illustrate how to transform shapes	DO	Complete systems with Corel Draw 11 packages.

	General Objective 4: Know how to Work with artistic text and paragraph text					
4	4.1 Explain how to work with artistic text 4.2 Explain how to work with paragraph text	Explain how to work with artistic text Explain how to work with paragraph text.	DO	Demonstrate how to work with artistic text Demonstrate how to work with paragraph text.	Supervise students	DO
	General Objective 5: Know how to Outline and fill objects					
5	5.1 Explain how to outline objects. 5.2 Explain how to fill objects	Explain different ways of outlining an object. Show students how to fill an object	Complete systems with Corel Draw 11 packages.	Demonstrate different ways of outlining an object. Demonstrate how to fill an object	DO	Complete systems with Corel Draw 11 packages.
	General Objective 6 Know how to Use special effects					
6	6.1 Explain the Special effects in Corel Draw 11. 6.2 Explain how to use the Special effects in 6.1 above.	Explain the Special effects in Corel Draw 11 Explain how to use the special effects. Explain how to give a background and watermarks to a text.	Complete systems with Corel Draw 11 packages.	Demonstrate how to use the special effects. Demonstrate how to give a background and watermarks to a text	DO	Complete systems with Corel Draw 11 packages.

	General Objective 7: Know how to Use symbols and clipart					
7	7.1 Explain the symbols in Corel Draw 11 7.2 Explain how to use the symbols in Corel Draw 11. 7.3 Explain how to use clipart	Explain the symbols in Corel Draw 11 Explain how to use the symbols Explain how to use clipart	Complete systems with Corel Draw 11 packages.	Demonstrate how to use the symbols in Corel Draw 11		Complete systems with Corel Draw 11 packages.
	General Objective 8: Understand the Printing and Customizing Options and Page Layouts					
8	8.1 Explain the Print options 8.2 Explain the Customizing Options available in Corel Draw 11 8.3Explain the page layouts in Corel Draw 11	Explain the Print options in Corel Draw 11 Explain Customizing options available in Corel Draw 11 Explain the page layouts	Complete systems with Corel Draw 11 packages.	Show the Print options in Corel Draw 11 Demonstrate Customizing options available in Corel Draw 11. Carry out the page layouts	Supervise activity	Complete systems with packages.
	General Objective 9: Understand how to use layers styles and templates					
9-10	9.1 Explain layer style 9.2 Explain how to use layer style 9.3 Explain templates 9.4 Explain how to use templates	Explain the layer style available Explain how to use the layer styles Explain how to use Templates	Complete systems with Corel Draw 11 packages.			Complete systems with Corel Draw 11 packages.

	General objective 10: Understand how to use Corel Trace to trace images and convert bitmap images into Vector Drawings					
11-12	10.1 Explain how to use Corel Trace 10.2 Explain how to convert bitmap images to vector drawings	Explain how to use Corel Trace to trace images. Illustrate how to convert bitmap images to vector drawings	Complete systems with Corel Draw 11 packages.	Convert bitmap images to vector drawings	Supervise activity	Complete systems with Corel Draw 11 packages.

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER PACKAGE IV (MS PUBLISHING)

CODE: VCS 125

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students acquire skills in MS Publishing.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1.0 Understand how to access MS PUBLISHER Program
2.0 Understand how to choose Designs Template
3.0 Understand how to use drawing tools
4.0 Know how to create, manipulate and customize wizards
5.0 Understand how to import and export images
6.0 Know how to crop and design page frames
7.0 Understand how to automate calendar creation

	General Objective 1: Understand how to access MS PUBLISHER Program					
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
1	1.1 Explain how to get started with MS Publisher 1.2 Explain how to get started with Website\email	Define publication and give examples of types of publication templates. Define a web network and internet Explore types of website,	A flip chart Power point presentation	Differentiate publications and start a design	Demonstrate activity 1.1 & 1.2	A flip chart Power point presentation
	General Objective 2: Understand how to choose Designs Template					
2	2.1 Explain how to design sets 2.2 Describe the options in putting up a design	Introduce processes in selecting design from scratch Highlighting option for putting up designs	A flip chart Power point presentation	Select a design option from scratch and start up a design from scratch	Assist student to understand publishing techniques	A flip chart Power point presentation
	General Objective 3: Understand how to use drawing tools					
3	3.1 Identify drawing tools for design 3.2 Explain the use of the drawing	Introduce the application of tools Illustrate the use of each tool applying tools in	A flip chart Power point presentation	Use drawing tools. Insert clip art to design.		A flip chart

	tools 3.3 Explain how to insert clip art to design 3.4 Explain how to Navigate around pictures	sample drawing. Highlight steps for choosing and inserting pictures		Navigate around pictures.		Power point presentation
	General Objective 4 Know how to create, manipulate and customize wizards					
4-6	4.1 Explain how to create wizard. 4.2 Explain how to manipulate or customize the wizard 4.2 Explain how to maximize the use of the wizard for design/ business letters	Introduce the functionalities of the wizards Explain advance features of the wizard for best result Explain how to use wizard to create business letters, memo, etc	A flip chart Power point presentation	Manipulate wizards Create business letters, memo, etc, using wizard.	Demonstrate manipulation of wizards Illustrate advanced features of wizards for best result	A flip chart Power point presentation
	General Objective 5: Understand how to import and export images					
7-8	5.1 Explain how to Import and Export Pictures/Graphics 5.2 Explain File compression through exportation	Explain the techniques of Importation and Exportation High light steps to a export a graphic object Explain the processes of compression through exportation	A flip chart Power point presentation	Import and export pictures, graphics.	Import and export procedures including compression	A flip chart Power point presentation

	General Objective 6 Know how to crop and design page frames					
9-10	6.1 Explain how to crop and design page frames 6.2 Explain how frames work.	Explain how to Manipulate Graphics/ Drawing through crop tool Introducing frames and modify them	A flip chart Power point presentation	Manipulate graphics and drawings through crop tools. Crop and design page frames	Supervise activities 6.1 and 6.2	A flip chart Power point presentation
	General Objective 7 Understand how to automate calendar creation					
11-12	7.1 Explain how to automate creation of calendars, posters etc 7.2 Explain how to Introduce frames and how to modify them.	Explain automation of posters and calendar creation Explain how to Introduce frames and how to modify them.	A flip chart Power point presentation	Create calendars, posters, etc.	Supervise activities	A flip chart Power point presentation

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: TYPING SKILL II

CODE: VCS 211

DURATION: HOURS/WEEK Lecture: 1 hrs Tutorial: 0 Practical: 2 hrs

UNITS: 3 Units

GOAL: This module is designed to equip the students with the ability to type day-to-day office assignments and also acquire a copying rate of 25 wpm on passages not below 1.3 syllabic intensity with 98% accuracy.

GENERAL OBJECTIVES: On completion of this module the leaner should be able to:

1. Know the proper erasing/correcting techniques.
2. Know the various types of paragraphs.
3. Know the various types of headings.
4. Know simple printer' correction signs.
5. Know common abbreviations.
6. Understand proof-reading.
7. Know the various kinds of letters – business, personal and official.
8. Understand the uses of inter-office memoranda.
9. Know how to address envelope.
10. Know how to type post-cards.
11. Understand various display methods.
12. Know how to type simple tabular jobs using various methods.
13. Know how to develop speed (Accuracy at 25 wpm)

Course Specification: Theory and Practical						
General Objective 1.0 Know the Proper Erasing/Correcting Techniques.						
Theoretical Content			Practical Content			
WEEK	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1	1.1 Explain why and when to erase. 1.2 List various erasing techniques. 1.3 Describe various erasing techniques.	Explain why and when to erase. List various erasing techniques. Describe various erasing techniques.	Computer systems Correction fluids	1.1 Protect computer when using Correction fluid. 1.2 Erase properly using a Computer eraser. 1.3 Erase properly using correcting fluid.	Explain how to erase neatly and properly by using: an eraser, correcting fluid. Observe students at work and evaluate.	Computer systems Correction fluids
General Objective 2.0: Know the Various Types of Paragraphs.						
2	1.1 Identify when to paragraph. 1.2 Identify types of paragraghing. 1.3 Describe the various types of paragraphs: block indented hanging numbered paragraphs	Identify when to paragraph. Identify types of paragraghing. Describe the various types of paragraphs: block indented hanging numbered paragraphs	Typing Sheet, Computer, Textbooks.	2.1 Type materials involving block, indented hanging and numbered paragraphs. 2.2 Type materials involving spacing after paragraph.	Explain the various types of paragraphs. - block - indented - hanging - numbered paragraphs Provide materials from textbooks for practice based on types of paragraph. Observe students at work and evaluate.	Typing Sheet, Computer, Textbooks.

General Objective 3.0: Know the Various Types of Headings.						
3	3.1 Explain the various types of headings: shoulder, side heading paragraph headings, main and sub headings.	Explain the various types of headings: shoulder, side heading paragraph headings, main and sub headings.	Computers Textbooks	3.1 Type various materials involving the various headings.	Explain the various types of headings: shoulder, side heading paragraph headings, main and sub headings. Provide materials for students' practice. Observe students at work and evaluate.	Computers Textbooks
General Objective 4.0: Know Simple Printers' Correction Signs.						
4	4.1 Explain printers' correction signs.	Explain printers' correction signs.	Typing Sheet/ Computer Textbooks	4.1 Type manuscripts containing printers' correction signs.	Explain printers' correction signs. Provide materials for practice. Observe students at work and evaluate.	Typing Sheet/ Computer Textbooks
General Objective 5.0: Know Common Abbreviations.						
5	5.1 Explain common abbreviations.	Explain common abbreviations.	Typing Sheet/ Computer Textbooks	5.1 Type manuscripts containing common abbreviations.	Explain common abbreviations. Provide materials for practice. Observe students at work and evaluate.	Textbooks
General Objective 6.0: Understand Proof-reading.						
6	6.1 Explain the importance of proof reading. 6.2 Explain the techniques for proof-reading.	Explain the importance of proof reading. Explain the techniques for proof-reading.	Typing Sheet/ Computer Textbooks	6.1 Proof-read all typed work.	Explain the importance of proof reading. Explain the techniques for proof-reading. Provide materials for practice. Grade students' work and ask students to proof -read.	Text books.

General Objective 7.0: Know the Various Kinds of Letters – Business, Personal and Official.						
7	7.1 Explain the uses of different types of letters e.g. Business, Personal and Official. 7.2 Explain the correct layout of personal letters. 7.3 Explain other parts, e.g. reference, attention line, subject heading etc. 7.4 Explain the various parts of an official letter. 7.5 Explain the correct layout of official letter.	Explain the uses of different types of letters e.g. Business, Personal and Official. Explain the correct layout of personal letters. Explain other parts, e.g. reference, attention line, subject heading etc. Explain the various parts of an official letter. Explain the correct layout of official letter.	Computer Typing Sheet Varied Exercises Textbook.	7.1 Type personal, business, official letters correctly. 7.2 Type business letters, using the various layouts and correct position of an official letter. 7.3 Type official letters.	Explain the uses of different types of letters e.g. Business, Personal and Official. Explain the correct layout of personal letters. Explain other parts, e.g. reference, attention line, subject heading etc. Identify the various layouts of business letters e.g., fully blocked, semi-blocked. Observe students at work and evaluate fully. Explain the various parts of an official letter. Explain the correct layout of official letter. Provide material for practice based on what was taught. Observe students at work and evaluate.	Computer Typing Sheet Varied Exercises Textbook.

General Objective 8.0: Understand the Uses of Inter-Office Memoranda.						
8	8.1 Explain the uses of Inter- Office memo 8.2 Describe various standards of memo forms. 8.3 Describe the standard parts of a memo form.	Explain the uses of Inter- Office memo Identify various standards of memo forms. Identify the standard parts of a memo form.	Computers Memo Forms.	8.1 Prepare a memo form on a computer. 8.2 Type correctly on a memo form.	Explain the uses of Inter- Office memo Identify various standards of memo forms. Identify the standard parts of a memo form. Provide materials for practice. Observe students at work and evaluate.	Computers Memo Forms.
General Objective 9.0: Know How to Address Envelopes.						
9	9.1 Describe various sizes and types of envelopes. 9.2 Identify various sizes and types of envelopes.	Describe various sizes and types of envelopes. Identify various sizes and types of envelopes.	Computers Textbook, Envelopes.	9.1 Type addresses on envelopes using correct sizes on various matter. 9.2 Type different notations on envelopes e.g. 'urgent'	Identify various sizes and types of envelopes. Provide relevant materials for practice. Observe students' work and evaluate.	Computers Textbook, Envelopes.
General Objective 10.0: Know How to Type Postcards.						
10	10.1 Explain the uses of postcards. 10.2 Explain how to address post cards of A6 size paper	Explain the uses of postcards. Explain how to address	Postcards A6 Paper Computer.	10.1 Type properly on post card of A6 size paper. 10.2 Type addresses	Explain the uses of postcards. Explain how to address post cards of A6 size paper	Postcards A6 Paper Computer.

		post cards of A6 size paper		properly on post cards of A6 size papers.	properly. Provide materials for practice based on post cards (A6) Observe students at work and evaluate.	
General Objective 11.0: Understand Various Display Methods						
11	11.1 Explain how to display matters such as notices, advertisements, invitations, menus etc. 11.2 Explain how to display given jobs using various techniques, e.g. underlining. initial caps, spaced caps, etc. 11.3 Explain how to calculate for horizontal and vertical centering.	Explain how to display matters such as notices, advertisements, invitations, menus etc. Explain how to display given jobs using various techniques, e.g. underlining. initial caps, spaced caps, etc. Explain how to calculate for horizontal and vertical centering.	Textbooks. Papers Computers	11.1 Display given jobs using various techniques. 11.2 Select appropriate standard of paper for the jobs.	Explain how to display matters such as notices, advertisements, invitations, menus etc. Explain how to display given jobs using various techniques, e.g. underlining. initial caps, spaced caps, etc. Explain how to calculate for horizontal and vertical centering. Provide exercises for practice. Observe students at work and evaluate.	Textbooks. Papers Computers

General Objective 12.0: Know How to Type Simple Tabular Jobs Using Various Methods.						
12	12.1 Explain how to calculate simple tabular work centering horizontal and vertically. 12.2 Explain how to rule correctly and how to type documents containing leader dots.	Explain how to calculate simple tabular work centering horizontal and vertically. Explain how to rule correctly and how to type documents containing leader dots.	Textbook. Papers. Computers.	12.1 Type simple columned work correctly. 12.2 Rule correctly when necessary and type documents containing various forms of leader dots.	Explain how to calculate simple tabular work centering horizontal and vertically. Explain how to rule correctly and how to type documents containing leader dots. Provide exercise for practice. Observe students at work and evaluate.	Textbook. Papers. Computers.
General Objective 13.0: Know how to Develop Speed/Accuracy						
12	13.1 Describe how to type with speed. 13.1 Describe how to type with accuracy	Describe how to type with speed. Describe how to type with accuracy	Stopwatch Varied Passages Computers.	13.1 Type straight copy materials at the rate of 25 wam for 10 minutes with 98% accuracy.	Provide timed graduated passages. Time students' work. Emphasize that erasure is not allowed in speed/accuracy. Emphasize that speed/accuracy is produced in double line spacing. Grade students work.	Stopwatch Varied Passages Computers.

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: OO BASIC PROGRAMMING I

CODE: VCS 212

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students acquire working skills in Basic Programming.

General Objectives: On completion of this course the students should be able to:-

1.0 Understand integrated development environment.
2.0 Understand the visual basic programming concept.
3.0 Understand, statements, Operations, Expressions, and object variables.
4.0 Know control statement in OOP.
5.0 Know the usage of procedure and functions.
6.0 Understand the use of Arrays and structures.

	Theoretical Content			**Practical Content**		
	General Objective 1.0: Understand the integrated Development Environment.					
Week/s	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-2	1.1 Describe the Integrated Development Environment (IDE) 1.2 Explain Project window 1.3 Describe Toolbox 1.4 Explain Form layout window 1.5 Describe Properties window 1.6 Describe Menu and toolbars	Describe: The Integrated Development Environment (IDE) Project Window Toolbox Form layout window Properties window Menu and toolbars	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Identify IDE, Project window, Toolbox, Form layout, Properties window, Menu and toolbars.	Guide students to Identify IDE, Project Window, Toolbox, Form Layout, Properties window, Menu and toolbars	Networked PC's loaded with OOFORTR, and a compiler
Week/s	**General Objective 2.0: Understand the visual basic programming concept.**					
3-4	2.1 Explain Visual programming 2.2 Explain Event-Driving Programming. 2.3 Explain VB character set 2.4 Explain Data types 2.5 Explain Data type conversion	Discuss: Visual programming Event-Driving Programming. VB character set Data types	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture	Identify VB character set Use data types and Variable names Write simple program to store and retrieve data	Guide students to identify VB character set. Demonstrate the use of data types and Variable	Networked PC's loaded with OOFORTR, and a compiler

	2.6 Explain the various types of variables 2.7 Explain the rules for forming variable names. 2.8 Explain Declaration of variables 2.9 Explain Storing and retrieving data in a variable. .	Data type conversion The various types of variables The rules for forming variable names. Declaration of variables Storing and retrieving data in a variable.	notes. Online lecture notes.		names. Write simple program to store and retrieve data	
Week/s	**General Objective 3.0: Understand Statements, Operators, Expressions and object variables.**					
5-6	3.1 Explain Visual Basic Statements, Operators, Expressions, and Object variables 3.2 Explain Object variable declaration 3.3 Explain Scope of variable 3.4 Explain Instances of an Object	Discuss: Operators and their various types Object data types Object variable declaration Scope of variable Instances of an object	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Write simple program.	Demonstrate how to use Operators Object data types Scope of variable Guide students on how to write simple program to implement the use of	Networked PC's loaded with OOFORTR, and a compiler

					operators, object data type and scope of variable	
Week/s	**General Objective 4.0: Know control statements in OOP**					
7-8	Explain 4.1 IF ….ELSE, SWITCH, CASE, FOR.. NEXT, WHILE …DO, DO … WHILE, DO … UNTIL statements	Discuss IF … THEN statement IF .. THEN .. ELSE statement SWITCH function CASE statement FOR.. NEXT statement WHILE … DO statement DO … WHILE statement DO … UNTIL statement	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Write program using the various control statements.	Guide students on how to write program to implement the various control statements.	. Networked PC's loaded with OOFORTR, and a compiler
Week/s	**General Objective 5.0: Know the use of procedure and functions**					
9-10	5.1 Explain the scope of variables such as public, private, global and static. 5.2 Explain the different types of constants e.g. system defined. 5.3 Explain the scope of constants. 5.4 Explain the concept of circular referencing. 5.5 Explain the concept of procedure. 5.6 Explain User's defined functions	Discuss: The scope of variables such as public, private, global and static. The different types of constants e.g. system defined. The scope of constants.	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture	Write program using the various variable declaration and .different types of constants. Write recursive procedures	Guide students on how to write program to implement the various control statements.	Networked PC's loaded with OOFORTR, and a compiler

	5.7 Explain how to define and call a function. 5.8 Explain how to define recursive procedures.	The concept of circular referencing. The concept of procedure. User's defined functions How to define and call a function. How to define recursive procedures.	notes. Online lecture notes.			
Week/s	**General Objective6.0: Understand the use of Arrays and structures.**					
11-12	6.1 Explain array declaration and subscript range. 6.2 Explain multiple array declaration. 6.3 Explain static, global and dynamic array declaration. 6.4 Explain static and dynamic allocations.	Explain array and when they are required in a program. Demonstrate the multiple arrays using a practical problem. Illustrate and explain with example static and dynamic array declaration.	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Write programs, which uses any static, global and dynamic array.	Guide students on how to write program to implement the various array declaration.	Networked PC's loaded with OOFORTR, and a compiler

PROGRAMME:	NVC IN COMPUTER SCIENCE
MODULE:	COMPUTER PACKAGE V (POWER POINT)
CODE:	VCS 213
DURATION:	HOURS/WEEK Lecture: 1hrs Tutorial: 0 Practical: 2hrs
UNITS:	3 Units
GOAL:	This module is designed to enable students acquire working skills in Power Point.

GENERAL OBJECTIVES: On completion of this course the students should be able to:-

1. Know how to Create, open and save Power point documents
2. Understand the structure of Power Point software
3. Know how to Choose a Design Template
4. Know how to Create slides of Power Point
5. Understand Selecting a Text Placeholder
6. Know how to Quit Power Point

	Theoretical Content			**Practical Content**		
	General Objective 1: Create, open and save Power point documents					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-2	1.1 Describe Selecting Programmes 1.2 Explain how to Save a document 1.3 Describe Opening an existing document. 1.4 Describe Keys and Icons 1.5 Explain Formatting	Illustrates how to select Power Point Program. Explain the command which saves a Power Point document. Save the document you have opened. Explain the command which opens an existing document. Open the document saved in 1.2 Explain the functions of status bars, Menu bars and drawing toolbars. Illustrate Power Point Views Explain how to format Power Point documents to specification.	Any complete system Multimedia Projector Infra-red Torch Screen Joystick	Demonstrate activities 1.1 – 1.5	Supervise activities	Any complete system Multimedia Projector Infra-red Torch Screen Joystick

	General Objective 2: Understand the structure of Power Point Software					
3-4	2.1 Explain the special features of Power Point documents. 2.2 Explain the meaning of Slides and Views. 2.3 Explain different Power Point Views.	Explain the special features of Power Point documents. Explain the meaning of Slides and Views. Explain different Power Point Views.	Any complete system Multimedia Projector Infra-red Torch Screen Joystick	Create a power point presentation.		Do
	General Objective 3: Know how to Choose a Design Template					
5-6	3.1 Explain how to choose suitable design templates for specific needs. 3.2 Explain the interactions of Power Point with other Windows	Explain how to choose suitable design templates for specific needs. Explain the interactions of Power Point with other Windows	Do	Choose suitable design templates	Supervise activities	
	General Objective 4: Know how to Create slides of Power Point					
7-8	4.1 Explain how to create Power Point Slides of different forms. 4.2Explain how to edit or modify slides. 4.3 Explain how to import documents from other office into slides.	Explain how to create Power Point Slides of different forms. Explain how to edit or modify slides. Explain how to import documents from other office into slides.	Any complete system Multimedia Projector Infra-red Torch Screen Joystick	Create Power point slides Import documents from other office into slides.	Supervise activities	Do

	General Objective 5: Selecting a Text Placeholder					
9-10	5.1 Explain how to select Text Placeholder. 5.2 Explain how to move slides during presentation	Explain how to select Text Placeholder. Explain how to move slides during presentation	Any complete system Multimedia Projector Infra-red Torch Screen Joystick	Demonstrate how to move slides during presentation	Supervise activities	Any complete system Multimedia Projector Infra-red Torch Screen Joystick
	General Objective 6: Quitting Power Point					
11-12	6.1 Explain how to end a slide show. 6.2 Explain how to quit the program. 6.3Explain how to conclude presentation	Explain how to end a slide show. Explain how to quit the program.	Any complete system Multimedia Projector Infra-red Torch Screen Joystick	Show how to end a slide show and quit the programme.	Supervise activities	Do

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: WEB DESIGN AND DEVELOPMENT I (HTML & XML)

CODE: VCS 214

DURATION: HOURS/WEEK Lecture :1hrs Tutorial: 0 Practical: 2hrs

UNITS: 2 Units

GOAL: This module is designed to enable students to acquire skills in web design and development.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1.0	Know the fundamental concepts of WWW.
2.0	Understand Hypertext mark-up language HTML
3.0	Understand scripting for HTML.
4.0	Understand DH TML.
5.0	Understand cascading style sheets.
6.0	Understand dynamic content.
7.0	Know web development tools.
8.0	Understand Multimedia.
9.0	Know XML.

	Theoretical Content			**Practical Content**		
	General Objective 1: Know the fundamental concepts of WWW.					
Week/s	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Define internet. 1.2 Define world wide web (WWW) 1.3 Outline the history of WWW. 1.4 Explain the Anatomy of a Web connection. 1.5 Explain how a web page works. 1.6 Explain how mark-up languages work. 1.7 Explain how hypertext works. 1.8 Explain how Universal Resource Location (URL) works.	Define internet. Define world wide web (WWW) Outline the history of WWW. Explain the Anatomy of a Web connection. Explain how a web page works. Explain how mark-up languages work. Explain how hypertext works. Explain how Universal Resource Location (URL) works.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Browse the internet. Apply different URL and to examine a very basic HTML file written which when manifested give rise to a web page.	To help student to: Brose the net Apply different URLs Examine simple web page written in HTML	Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page

Week/s	**General Objective 2: Understand creation and customizing in HTML**					
2-3	2.1 State functions of HTML. Text formatting, hyperlinks, tables and lists, graphics, sound and video support. 2.2 Plan and write a HTML document. 2.3 Preview and edit a web page. 2.4 Create links to other web pages. 2.5 Print an HTML document. 2.6 Create ordered list in HTML document. 2.7 Create unordered list in HTML document. 2.8 Control font selection in HTML document. 2.9 Customize fonts in HTML document. 2.10 Align text in HTML document.	State functions of HTML. Text formatting, hyperlinks, tables and lists, graphics, sound and video support. Plan and write a HTML document. Preview and edit a web page. Create links to other web pages. Print an HTML document. Create ordered list in HTML document. Create unordered list in HTML document. Control font selection in HTML document. Customize fonts in HTML document. Align text in HTML document.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Write a simple HTML based document Create a simple web page. Use various HTML tags to enhance quality and appearance of a web page.	.Assists students in performing their Lab work	Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page

	2.11Explain how to Insert graphics and specify graphic size. 2.12 Explain how to Link graphics in HTML document. 2.13 Explain how to insert on image map in HTML document. 2.14 Explain how to add background image in HTML document.	Explain how to insert graphics and specify graphic size. Explain how to link graphics in HTML document. Explain how to insert on image map in HTML document. Explain how to add background image in HTML document.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Add graphics and multimedia to HTML documents	.Assists students in performing their Lab work	Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page
	2.15 Explain how to use forms to control input. 2.16 Explain how to create a text entry field. 2.17 Explain how to add radio buttons. 2.18 Explain how to add checkboxes 2.21 Explain how to create a pull down menu 2.22 Explain how to add a push button 2.23 Explain how to connect a forms back end.	Explain how to: Use forms to control input. Create a text entry field. Add radio buttons. Add checkboxes Create a pull down menu Add a push button Connect a forms back end.	P.C connected to OHP Power point presentation of Lecture notes.	Plan a form and use it to control input.	Assists students in performing their Lab work	Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page

Week/s	**General Objective 3: Understand scripting for HTML.**					
4	3.1 To Explain how to perform scripting in an HTML documents.	3.1 To Explain the advantages of using scripting with HTML (Flexibility, Simplification immediate response, improved interactivity, reduced server loads)	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Create & design scripts using objects Design & implement scripts, using Java scripts event handlers. Create functions, assign variables, Create conditional scripts.	Assist students in their practical work.	. Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page
Week/s	**General Objective 4: Understand Dynamic Hypertext mark-up language (DH TML).**					
5	4.1 Define dynamic HTML 4.2 Explain the building blocks of DHTML 4.3 Tour DHTML pages 4.4 Describes DHTML object model 4.5 Describe Browser variability 4.6 Design D HTML pages.	Define dynamic HTML Explain the building blocks of DHTML Tour DHTML pages Describes DHTML object model Describe Browser variability Design D HTML pages	P.C connected to OHP Power point presentation of Lecture notes.	Design and implement web page using DHTML.	Provide guidance and assistance in student practical work.	Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page

Week/s	**General Objective 5: Understand cascading style sheets**					
	5.1 Explain creation of embedded style sheet, class criterion, and Browser detect. 5.2 Explain how to show and hide page elements 5.3Explain how to change font size dynamically 5.4Explain how to control font colour dynamically 5.5 Explain how to use external style sheet for above.	Explain how to show and hide page elements Explain how to change font size dynamically Explain how to control font colour dynamically using external style. Explain how to use external style sheet for above.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Create an embedded style sheet, and class. Implement browsers detection. Show and hide page elements Chang font size, font colour dynamically Demonstrate how to use external style sheet in a document.	Provide guidance and assistance in student practical work.	Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page
	General Objective 6: Understand dynamic content.					
6-7	6.1 Explain the dynamic content by inserting and deleting dynamically 6.2 Explain replacing graphics dynamically 6.3 Explain bind and manipulate data dynamically	Explain dynamic content by • Inserting content dynamically • Deleting content dynamically • Modifying,	P.C connected to OHP Power point presentation of	Insert, delete, and modify content dynamically. Incorporate assent	Provide guidance and assistance in student practical work.	Networked PC Lab connected to the internet.. Web application packages such as Dream weaver,

		Content Dynamically • Incorporating assent advanced content function. • Replacing graphics dynamically. • Bind data • Manipulate bound data dynamically.	Lecture notes. On line lecture notes	advanced content function. Replace graphics, bind data dynamically.		MS front page
Week/s	**General Objective 7.0 Know web development tools.**					
8-9	7.1 Explain how to position an element absolutely. 7.2 Explain how to position an element relatively 7.3 Explain how to size an element manually 7.4 Explain how to stack screen elements 7.5 Explain how to add a scroll bar 7.6 Explain how to create a side bar 7.7 Explain how to incorporate an advanced positioning function.	Explain how to: Position an element absolutely. Position an element relatively Size an element manually Stack screen elements Add a scroll bar Create a side bar Incorporate an advanced positioning function.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Position an element absolutely, relatively. Size an element manually. Stack screen elements Add a scroll bar, and create side bar. Incorporate an advanced positioning function.	Provide guidance and assistance in student practical work.	Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page

Week/s	**General Objective 8**: Understand Multimedia					
10-11	Explain the operation of Web application development Packages such as: 8.1 PhotoShop, 8.2 Animation Packages, 8.3 Dreamweaver, 8.4 Flash.	Explain the operation of Graphic packages such as: PhotoShop, Animation Packages, Dreamweaver, Flash,	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Develop a simple web application using web application software .	Provide guidance and assistance in student practical work.	Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page, Flash, PhotoShop
Week/s	**General Objective 9:** Understand the operation and usage of XML					
12	9.1 Explain the operation and application of XML 9.2 Demonstrate how XML is used 9.3 Explain the advantages of using XML	Provide an introduction to XML Demonstrate how XML is used Explain the advantages of using XML	P.C connected to OHP Power point	Use XML package and apply to a given case.	Provide guidance and assistance in student practical work.	Networked PC Lab connected to the internet.. XML and CSS packages

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: DATA COMMUNICATION

CODE: VCS 215

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students to acquire knowledge and skills in data communication and networking.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1.0	Know the definition of data communication and different equipment and components used.
2.0	Understand modulation and multiplexing.
3.0	Understand transmission modes, and media.
4.0	Understand the need for communication Protocols.
5.0	Understand the concepts of computer Networks and Topology.
6.0	Understand network implementation and security.

	Theoretical Content			**Practical Content**		
	General Objective 1: Know the definition of data communication and different equipment and components used.					
Week/s	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-2	1.1 Explain the need for Data communication 1.2 Identify data communication equipment 1.3 Explain the function of data communication equipment.	To be able to: Define Data Communication Explain the need for communication between machines. Explain the functions of online equipment, interactive terminals and batch processing terminals. Explain the functions of equipment like: line controller, line drivers, modems, digital service unit, traffic clustering devices such as multiplexers and concentrators. Discuss other equipment: Front-end-processors, workstations, monitoring device, diagnostic and testing equipment	PC connected to an O.H.P. loaded with a presentation package. On line lecture notes.	Identify communication equipments, components/ materials used in computer communications industry.	To show students samples of on-line equipment, interactive terminals and any other communication equipments. equipment.	Networked Communication Lab where aspects of data communication may be demonstrated and used. PC Communication Equipments such as cable, Fiber optics Modem Routers, Hubs, Switches…etc
Week/s	**General Objective 2: Understand modulation and multiplexing**					
3-4	2.1 Explain the need for modulation 2.2 Explain modulation techniques	Define modulation Describe the different types of modulation amplitude, frequency and phase.	PC connected to an O.H.P. loaded with	Track different Modulation techniques using Oscilloscope or any other	To assist students engaged in their lab work.	Networked Communication Lab where aspects of data communication

	2.3 Explain multiplexing techniques	Explain frequency division multiplexing time division and statistical multiplexing. Define a concentrator. Differentiate between a multiplexer and a concentrator.	a presentation package. On line lecture notes	tracking device.		may be demonstrated and used. PC Communication Equipments such as cable, Fiber optics Modem Routers, Hubs, Switches…etc PC with overhead projector, Oscilloscope.
Week/s	**General Objective 3: Understand Transmission modes, media and organisation.**					
5-6 .	3.1 Explain transmission modes 3.2 Describe transmission techniques 3.3 Explain different transmission Media and appreciate their properties..	Explain different transmission modes such as Simplex, Half Duplex and full duplex. Explain Synchronous and Asynchronous transmissions modes.. Explain Different transmission links, such as, Terrestrial links (switched and leased telephone lines, twisted pair cables, coaxial cables, optical fibers micro-wave (radio, wireless, satellite) Compare and Contrast the media listed in 3.4 above.	PC connected to an O.H.P. loaded with a presentation package. On line lecture notes	Test different transmission modes, using appropriate communication equipments.	To assist students in their practical work and offer guidance where necessary.	Networked Communication Lab where aspects of data communication may be demonstrated and used. PC Communication Equipments such as cable, Fiber optics Modem Routers, Hubs, Switches…etc

	General Objective 4: To understand the need for communication protocol					
7-8	4.1 Identify communication software and their characteristics.	Explain communication software Discuss typical communication software characteristics Explain the functions of different categories of communication software, such as application software, performance software, teleprocessing software, line control software. Identify different communication software – Application software, performance software, teleprocessing software, line-control software	PC connected to an O.H.P. loaded with a presentation package. On line lecture notes	Use different communication software and packages.	To assist student in their practical work and offer guidance where necessary	Networked Communication Lab where aspects of data communication may be demonstrated and used. PC Communication Equipments such as cable, Fiber optics Modem Routers, Hubs, Switches…etc Various appropriate communication Packages
	4.2 Explain the need for communication protocols	Explain communication Protocols Explain the need for communication Protocols Identify different transmission protocol, e.g. (synchronous Asynchronous) Format of communication	PC connected to an O.H.P. loaded with a presentation package. On line lecture	Examine the functionality of different communication protocols. Write simple communication protocol.	To assist students in their practical work and offer guidance where necessary	Networked Communication Lab where aspects of data communication may be demonstrated and used. PC Communication Equipments such as cable,

		protocol for synchronous and Asynchronous. Describe typical transmission protocol, such as BSC, SDLC, HDLC, ATM, SPX, IPX, TCP/IP.	notes			Fiber optics Modem Routers, Hubs, Switches…etc Various appropriate communicatio n Packages
Week/s	**General Objective 5: 0 Understand the concepts of computer Networks and Topology.**					
9-10	5.1 Explain the need for network Topology 5.2 Explain the need for layered approach in network design.	Define a network Explain the rational for a computer network Explain the components of an existing computer network. Describe different network topologies, such as point to point, multi drop, Star, Tree, BUS, Ring, Mesh and Hybrid. Explain ISO standard reference module. State the objectives of different layer in the ISO reference module. Provide examples of existing network architecture such as SNA,DNA ARPNET, JANET…etc	PC connected to an O.H.P. loaded with a presentatio n package. On line lecture notes	Set up and use different topologies in a laboratory.	To assist student in their practical work and offer guidance where necessary	Networked Communicatio n Lab where aspects of data communicatio n may be demonstrated and used. PC Communicatio n Equipments such as cable, Fiber optics Modem Routers, Hubs, Switches…etc Various appropriate communicatio n Packages
General Objective 6: Understand Network Implementation and Security						

11-12	6.1 Explain the characteristics of LAN, MAN, WAN Internet, Intranet. 6.2 Explain LAN Topology and data communication using BUS, RING Star Topologies. 6.3 Explain the need for network security. 6.4 Describe error detection and correction in network security.	Discuss distance-based classification of computer networks e.g. LAN, MAN, WAN, Intranets, Internet, etc. List networking, internet working. State and discuss the characteristics of devices and /components such as repeaters, bridges, routers, gateways, cables, connectors servers, clients, workstations, VSAT, ……etc. Explain Structured cabling. Explain different topologies used in local area network. Discuss the application area of different topology Discuss the merits associated with each topology. Explain Network Security Discuss steps in ensuring network security. Discuss fundamentals of cryptography (secret-key, public-key, authentication and digital signatures, firewalls … etc)	PC connected to an O.H.P. loaded with a presentation package. On line lecture notes	Examine characteristics of different types of networks. Perform simple cabling and show network security and access rights. Carryout ciphering techniques. Detect and correct error.	To assist student in their practical work and offer guidance where necessary	Networked Communication Lab where aspects of data communication may be demonstrated and used. PC Communication Equipments such as cable, Fiber optics Modem Routers, Hubs, Switches…etc Various appropriate communication Packages

PROGRAMME:	NVC IN COMPUTER SCIENCE
MODULE:	MULTIMEDIA
CODE:	VCS 216
DURATION:	HOURS/WEEK Lecture :1hrs Tutorial: 0 Practical: 2hrs
UNITS:	3 Units

GOAL: This module is designed to enable students to acquire knowledge and skills in multimedia.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1. Understand types of multimedia
2. Understand Visualization & the creative process
3. Know multimedia planning
4. Understand Multimedia production
5. Understand the anatomy of a Web page
6. Know graphic design
7. Know digital sound
8. Understand with Group Project Session

	Theoretical Content				**Practical Content**	
	General Objective 1: Understand types of multimedia					
Week/s	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Describe what is multimedia. 1.2 Explain multimedia platforms.	Explain to student how to think multimedia such as Media-Multimedia-Hypermedia	Capability to project and demonstrate multimedia A comprehensive workbook of multimedia	Use Multimedia Platforms	Supervise the laboratory and support students in doing exercises to use Multimedia Platforms.	White board/ Computers loaded with *PowerPoint, QuickTime* A comprehensive workbook of multimedia
	General Objective 2: Understand Visualization & the creative process					
2	2.1 Describe Visualization and the creative process	To explain Visualization and the creative process	Capability to project and demonstrate Visualization & the creative process A comprehensive workbook of multimedia	Use different Multimedia Presentation Software	Supervise the laboratory and support students in doing exercises of using different Multimedia Presentation Software	White board/ Computers loaded with *PowerPoint, QuickTime*, and different Multimedia Presentation Software. Comprehensive workbook of multimedia
	General Objective 3: Know multimedia planning					
3	3.1 Describe multimedia planning	Explain multimedia planning	Capability to project and demonstrate multimedia planning	Use the *"Thinking" Multimedia: Inspiration Demo*	Supervise the laboratory and support students in doing exercises Using the *"Thinking"*	White board/ Computers loaded with *"Thinking"*

			A comprehensive workbook of multimedia		*Multimedia: Inspiration Demo*	*Multimedia: Inspiration Demo* A comprehensive workbook of multimedia
	General Objective 4: Understand Multimedia production					
4-5	4.1 Describe multimedia PRE-production	To explain multimedia PRE-production	Capability to project and demonstrate multimedia PRE-production A comprehensive workbook of multimedia	Use *HTML: Introducing Dreamweaver*	Supervise the laboratory and support students in doing exercises of using *HTML and Dreamweaver*	White board/ Computers loaded with *Dreamweaver* A comprehensive workbook of multimedia
	General Objective 5: Understand The anatomy of a Web page					
6-7	5.1 Describe the structure of a Web page . 5.2 Explain Designer's guide to HTML	Explain the anatomy of a Web page. Explain how to design an HTML	Capability to project and demonstrate The anatomy of a Web page and How to design an HTML A comprehensive workbook of multimedia	Use ***Storyboards & Flowcharts Due***	Supervise the laboratory and support students in doing exercises of Using ***Storyboards & Flowcharts Due***	White board/ Computers loaded with *Storyboards & Flowcharts Due* A comprehensive workbook of multimedia

	General Objective 6: Know graphic design					
8-9	6.1 Describe the main concepts graphic design	Explain the main concepts graphic design and the related issues	Capability to project and demonstrate concepts graphic design A comprehensive workbook of multimedia	Use ***Scanners &/or Digital Cameras***	Supervise the laboratory and support students in doing exercises of **using *Scanners &/or Digital Cameras***	White board/ Computers and *Scanners &/or Digital Camera* A comprehensive workbook of multimedia
	6.2 Explain Photoshop I	Explain Photoshop I	A comprehensive workbook of multimedia	Use basic features of Adobe Photoshop I	Supervise the laboratory and support students in doing exercises of using basic features of Adobe Photoshop I	White board/ Computers loaded with Adobe Photoshop I A comprehensive workbook of multimedia
	6.3 Explain Photoshop II	Explain Photoshop II	A comprehensive workbook of multimedia	Use basic features of Adobe Photoshop II	Supervise the laboratory and support students in doing exercises of Be able to using basic features of Adobe Photoshop II	White board/ Computers loaded with Adobe Photoshop II A comprehensive workbook of multimedia
	General Objective 7: Know digital sound					
10	7.1 Describe the basics of digital sound and using	Explain the basics of digital sound	Capability to project and demonstrate	*Manipulate Digital Audio*	Supervise the laboratory and	White board/ Computers and digital video tools

	digital video in multimedia	and Using digital video in multimedia	A comprehensive workbook of multimedia		support students in doing exercises of *Manipulating Digital Audio*	A comprehensive workbook of multimedia
	7.2 Explain GIF		White board/ Computers and digital video tools	Use GIF	Supervise the laboratory and support students in doing exercises of use GIF	White board/ Computers loaded with appropriate software A comprehensive workbook of multimedia
	7.3 Describe Adobe Premiere		White board/ Computers and digital video tools	Use basic Adobe Premiere	Supervise the laboratory and support students in doing exercises of using basic Adobe Premiere	White board/ Computers loaded with Adobe Premiere A comprehensive workbook of multimedia
	General Objective 8: Understand Working with Group Project Session					
	8.1Describe how to write project report and present a project in class presentation.	Explain to students how to write project report and present a project in class presentation.	White board/ Computers loaded with appropriate software and tools.	Write project report and present project in Class.	Supervise the laboratory and support students in doing exercises of writing project report and presenting a project in class presentation	White board/ Computers loaded with appropriate software and tools A comprehensive workbook of multimedia

PROGRAMME:	NVC IN COMPUTER SCIENCE
MODULE:	FUNDAMENTALS OF INTERNET TECHNOLOGY
CODE:	VCS 217
DURATION:	HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs
UNITS:	3 Units

GOAL: This module is designed to enable students to have basic knowledge of Internet.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1.0	Understand the concept of Internet.
2.0	Know the concept of Internet.
3.0	Know the various services on the Internet.
4.0	Understand Internet connectivity.
5.0	Know the obstacles to Internet growth in Nigeria.

	Theoretical Content			**Practical Content**		
	General Objective 1: Explain the concept of Internet					
Week/s	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-2	1.1Define Internet 1.2Narrate History of Internet 1.3Distinguish between internet and intranet 1.4 Define Data transmission	Explain Internet concept Explain historical background of the Internet. Discuss Intranet and Extranet Distinguish between Internet, Intranet and Extranet. Discuss data transmission. Discuss the various transmission media	White Board PC loaded with Power point and connected OHP	Find organizations using Intranet and Extranet	Assist students to find organizations having Intranet and Extranet.	Networked PC's connected to the Internet
	General Objective 2: Know the concept of internet.					
3-4	1.1 Explain simple computer Network techniques 1.2Classify computer network by geographical coverage. 1.3 List some major networks. 1.4 List the benefits of Internet	Discuss computer networks such as APPANET, NUFNET AND MILNET Explain classifications of computer network. Distinguish between APPANET, NUFNET and MILNET Explain the economics, social, political,	Ditto	Search for documentations of APPANET, NUFNET and MILNET from the Internet.	Guide the students on how to obtain materials from the Internet about the structure of the APPANET, NUFNET and MILNET	Ditto

		educational and cultural benefits of Internet.				
Week/s	**General Objective 3:** 0 Know various services on the internet					
5-6	1.1 Explain Internet Services 1.2 Explain the meaning of cyber-café 1.3 State general procedures in a Cybercafé	Discuss: Various Internet services like E-commerce, E-mail, file transfer protocol (FTP), Bulletin Board Service, Audio-Video Communication, Digital Library, world wide web, Telnet and other services. The concept of cyber-café The steps involved in _ybercafé operations. Personnel requirements of a _ybercafé e g. server/network administrator. Security devices in a cybercafé	White Board PC loaded with Power point and connected to OHP	Use the various services available on the Internet.	Demonstrate how to use the various Internet services. Take the students to a cyber café	.
Week/s	**General Objective 4: 0** Understand internet connectivity					
7-8	4.1 State Basic Hardware requirements for Internet connectivity 4.2 Define a MODEM and state its functions. 4.3 State the fuctions of MODEM. 4.4 Explain the basic concept of wireless	List and explain the basic hardware required for Internet connectivity. Discuss MODEM and its functions Explain the data transfer rate of various modem.	White Board. PC loaded with PowerPoint and connected to the	Identify different types of Modem's Connect to the Internet Identify VSAT, Radio and Dial-	Show different types of Modem's to students Demonstrate how to connect to	Networked PC's connected to the Internet.

	transmission. 4.5 Enumerate the steps required to connect to the Internet. 4.6 Describe various network protocol	Explain the concept of wireless transmission and bandwidth. Discuss various wireless transmission media: VSAT, Radio etc Discuss obstacles to effective transmission. Discuss the steps required to connect a PC to the internet. Explain network protocol. Give examples of network protocol State advantages of TCP/IP for Internet connectivity.	Internet OHP Different types of MODEM	up links.	the Internet Take students to different cyber café that use VSAT, Radio and Dial-up to connect to the Internet.	
Week/s	**General Objective 5:** Know obstacles to internet growth in Nigeria					
9-12	5.1Explain obstacles to Internet growth in Nigeria. 5.2Describe Internet Service Provider (ISP) concept. 5.3 Explain the concept of Domain Name System	Discuss Problems of telecommunication infrastructure in Nigeria. Technical know-how Economic factors in Nigeria-poverty level of the people. Level of awareness. The government policies on	White Board PC loaded with PowerPoint and connected to Internet OHP A popular ISP	Discuss possible solutions to the problems of Internet connectivity in Nigeria	Guide students on how to name servers in Domain Name System Take students to a popular ISP	Ditto

		internet access. Explain the concept of ISP and the need for it. Explain the economic effect of using local or foreign ISP. Describe domain name system (DNS) and its space Explain how to name servers in the DNS.				

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: AUTOCAD

CODE: VCS 221

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to give students the basic skills needed to use the AutoCAD software package to produce drawings.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1.0	Understand the principles of operation, capabilities and system requirements of AutoCAD
2.0	Understand the use of OSNAP facility to select options
3.0	Know how to save drawings on demand and set up the auto-save features
4.0	Know how to AutoCAD to draw.

	Theoretical Content			**Practical Content**		
	General Objective 1: Understand the principles of operation, capabilities and system requirements of AutoCAD					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-3	1.1 Explain the principles of operation, capabilities and system requirements of AutoCAD 1.2 Install the AutoCAD software correctly 1.3 Give commands in AutoCAD using the keyboard and mouse. 1.4 Explain how to use the help menu to solve problems when using the AutoCAD package	• Explain the advantages of Computer Aided Drafting • List all known CAD softwares • Guide students on how to use snap point to construct lines • Give assignments to students	• Latest version of AutoCAD software packages	Install the AutoCAD software Show commands in AutoCAD	Supervise activity	PC AutoCAD Software
	General Objective 2: Understand the use of OSNAP facility to select options					
4-6	2.1 Change the layers in a drawing using the Layer Control. 2.2 Draw lines using Cartesian and Polar co-ordinate. 2.3 Prepare and change the size of the drawing zone 2.4 Save drawings on demand and set up the auto-save feature	• Explain the difference between Cartesian and polar co-ordinates systems • Show how to construct lines at set lengths and angles using Cartesian and Polar co-ordinates	• Computer systems	Construct lines at set lengths and angles using Cartesian and Polar co-ordinates		

5-9	**General Objective 3: Know how to save drawings and use the auto-save feature**					
	3.1 Save drawings on demand 3.2 Set up the auto-save feature	• Show students how to save drawings and set up auto save feature	- Do -	Save drawings on demand Set up the auto-save feature	Supervise students on tasks	
	General Objective 4: Know how to use the AutoCAD to draw					
10-12	4.1 Produce a simple drawing 4.2 Use the Mesh System to produce drawings. 4.3 Change the drawing scale 4.4 Draw a line using the command line 4.5 Create the title block for a drawing 4.6 Write letters and numbers on drawing 4.7 Draw circles and be able to erase parts of lines or circles 4.8 Produce a simple drawing with Corel detail in terms of title block	• Produce a simple drawing with all necessary details for students to see • Guide students to produce similar simple drawing to specification • Give further exercises on drawings e.g. drawing of a complete building project • Give drawing assignments to students	- Do -	Produce a simple drawing. Use the Mesh System. Change the drawing scale Draw a line using the command line. Create the title block for a drawing Write letters and numbers on drawing. Draw circles and be able to erase parts of lines or circles. Produce a simple drawing with Corel detail in terms of title block.	Guide students on activities	

PROGRAMME:	NVC IN COMPUTER SCIENCE
MODULE:	PHOTOSHOP
CODE:	VCS 222
DURATION:	HOURS/WEEK Lecture :1hrs Tutorial: 0 Practical: 2hrs
UNITS:	3 Units
GOAL:	This module is designed to enable students acquire working skills in Photoshop.

GENERAL OBJECTIVES: On completion of this course the students should be able to:-

1. Understand the basic elements of digital imaging
2. Know the basics of choosing colour and selecting images
3. Understand the concept of layers and retouching
4. Know the Graphic types and application
5. Understand Printing Principles using Photoshop

	Course: : Computer Packages (Photoshop)	**Course Code:** VCS 206		**Credit Hours:**
	Year:	**Pre-requisite:**		
	General Objective 1: Understand the basic elements of digital imaging			

Week	Specific Learning Outcomes	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-2	1.1 Explain basic concept of digital imaging. 1.2 Explain various compression techniques 1.3 Explain the basic features of Photoshop. 1.4 Identify the work area of Photoshop. 1.5 Explain how to use the toolbox 1.6 Explain how to get images into Photoshop. 1.7 Identify the Bitmap images and Vector graphics 1.8 Explain how to import and scan images	Explain the basic concepts of digital imaging. Illustrate various compression techniques. Explain the features of Photoshop. Explain how to access the work area. Illustrate how to use the toolbox Illustrate how to get images into the Photoshop Explain Bitmap images and Vector graphics Illustrate how to import, and how to scan images.	Computer system photoshop software	Illustrate various compression techniques Illustrate how to use the toolbox Get images into the Photoshop Import and scan images	Illustrate various compression techniques Illustrate how to use the toolbox Illustrate how to get images into the Photoshop Illustrate how to import, and how to scan images	Computer system photoshop software
	General Objective 2: Know the basics of choosing colors and selecting images					
3-4	2.1 Explain how to choose color 2.2 Describe how to reproduce color accurately 2.3 Explain how to make color and tonal adjustment	Explain how to choose color. Illustrate how to reproduce color accurately. Explain how to make color adjustment Explain how to make tonal	Computer system photoshop software	Reproduce color accurately. Illustrate various ways of using each	Illustrate how to reproduce color accurately. Illustrate	Computer system photoshop software

	2.4 Describe how to use marquee, lasso, and magic wand tools to select parts of an image. 2.5 Describe how to reposition a selection marquee 2.6 Describe how to deselect a selection 2.7 Describe how to move a selection 2.8 Describe how to duplicate a selection 2.9 Describe how to adjust a selection with arrow keys 2.10 Describe how to add to and subtract from selections 2.11 Describe how to rotate, scale, and transform a selection 2.12 Explain how to combine selection tools 2.13 Explain how to crop an image	adjustment. Illustrate various ways of using each of: marquee tool, lasso tool and magic wand tool to select parts of an image. Illustrate how to reposition a selection marquee. Illustrate how to deselect a selection Explain how to move a selection Explain how to duplicate a selection. Illustrate how to adjust a selection using the arrow keys. Explain how to add to a selection explain how to subtract from a selection. Explain how to rotate a selection. Explain how to scale a selection Explain how to transform a selection. Explain how to combine two or more selection tools. Explain when this is necessary. Explain what it means to crop an image. Explain the processes of cropping an image.	Computer system photoshop software	of: marquee tool, lasso tool and magic wand tool to select parts of an image. Reposition a selection marquee. Illustrate how to deselect a selection Adjust a selection using the arrow keys. Crop an image.	various ways of using each of: marquee tool, lasso tool and magic wand tool to select parts of an image. Illustrate how to reposition a selection marquee. Illustrate how to deselect a selection Illustrate how to adjust a selection using the arrow keys.	Computer system photoshop software

	General Objective 3: Understand the concept of layers and retouching					
5-7	3.1 Describe how to use channels and masks. 3.2 Describe how to use layers 3.3 Choose the correct resolution for scanned photographs 3.4 Describe how to crop an image to a final size 3.5 Describe how to adjust the tonal range of an image 3.6 Remove a color cast from an image using an adjustment layer 3.7 Explain how to change the hue and saturation of a selected color in a photograph using Replace Color command. 3.8 Explain how to adjust the saturation and brightness of isolated areas of an image using sponge and dodge tool 3.9 Explain how to use rubber stamp tool to eliminate an unwanted object from an image 3.10 Explain how to replace parts of an image with another. 3.11 Know how to finish the photo re-touching process.	Explain how to use channels and masks Illustrate how to use layers Illustrate how to choose resolutions for scanned images Demonstrate how to crop an image to a final size. Demonstrate how to adjust the tonal range of an image Demonstrate how to remove a color cast from an image using adjustment layer. Demonstrate how to use the Replace Color command to change the hue and saturation of a selected color in a photograph. Explain the sponge and dodge tools explain how they can be used to adjust the saturation and brightness of an isolated area of an image. Demonstrate how to use rubber stamp tools to eliminate unwanted objects from an image Illustrate how to substitute parts of an image. Illustrate the use of	Computer system photoshop software	Choose resolutions for scanned images Crop an image to a final size. Adjust the tonal range of an image Remove a color cast from an image using adjustment layer. Use rubber stamp tools to eliminate unwanted objects from an image. Illustrate how to substitute parts of an image. Save Adobe Photoshop in a format that can be used by a page layout program	Illustrate how to choose resolutions for scanned images Demonstrate how to crop an image to a final size. Demonstrate how to adjust the tonal range of an image Demonstrate how to remove a color cast from an image using adjustment layer. Demonstrate how to use rubber stamp tools to eliminate unwanted objects from an	Computer system photoshop software

	3.12 Explain how to save an Adobe Photoshop file in a format that can be used by a page layout program.	Unsharp Mask Filters Illustrate how to save Adobe Photoshop in a format that can be used by a page layout program			image	
	General Objective 4: Know the Graphic types and Application					
8-9	4.1 Explain the Outline graphic type 4.2 Explain Bitmap graphic type 4.3 Explain how to carry out painting in Photoshop 4.4 Explaind the concept of Filters 4.5 Explain how to preview 4.6 Describe how to blend filter effect 4.7 Describe how to create Special Effects. 4.8 Describe how to apply filters to individual channels 4.9 Describe how to create backgrounds.	Explain different graphic types Explain Outline graphic type Explain Bitmap graphic type Illustrate painting in Photoshop Demonstrate how to Filters Illustrate previewing. Demonstrate how to blend effects of filters. Illustrate the processes for creating special effect Demonstrate how to apply filters to individual channels Illustrate how backgrounds are created.	Computer system photoshop software	Illustrate painting in Photoshop Demonstrate how to use Filters Illustrate previewing. Blend effects of filters. Create special effect Apply filters to individual channels Create backgrounds .	Illustrate painting in Photoshop Demonstrate how to use Filters Illustrate previewing . Demonstrate how to blend effects of filters. Illustrate the processes for creating special effect.	Computer system photoshop software
	General Objective 5: Understand Printing Principles using Photoshop					
10-12	5.1 Explain how to export images 5.2 Explain object linking and embedding to and from other applications 5.3 Demonstrate how to print Photoshop images 5.4 Demonstrate how to combine	Explain how to export images Explain object linking and embedding to and from other applications Demonstrate how to print Photoshop images	Computer system photoshop software	Print Photoshop images. Combine Illustrator Graphics and Photoshop	Demonstrate how to print Photoshop images Demonstrate how to	Computer system photoshop software

	Illustrator Graphics and Photoshop images. 5.5 Illustrate how to place an adobe Illustrator Graphic in an Adobe Photoshop file.	Demonstrate how to combine Illustrator Graphics and Photoshop images. Illustrate how to place an adobe Illustrator Graphic in an Adobe Photoshop file.	Computer system photoshop software	images. Place an adobe Illustrator Graphic in an Adobe Photoshop file.	combine Illustrator Graphics and Photoshop images. Illustrate how to place an adobe Illustrator Graphic in an Adobe Photoshop file.	Computer system photoshop software

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER PACKAGE VI (MS ACCESS)

CODE: VCS 223

DURATION: HOURS/WEEK Lecture :1hrs Tutorial: 0 Practical: 2hrs

UNITS: 2 Units

GOAL: This module is designed to enable students acquire working skills in Microsoft Access

GENERAL OBJECTIVES: On completion of this course the students should be able to:-

1. Understand Database basic concepts.
2. Understand ACCESS objects and their purposes.
3. Understand how to create and Customize tables
4. Understand how to create and edit records
5. Understand how to Preview and Print Datasheet.
6. Know the concepts of Query.
7. Understand the internet history and concepts
8. Understand the concept and fundamentals of E-business and E-Commerce

	Theoretical Content			**Practical Content**		
	General Objective 1: Understand Database basic concepts.					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	2.1 Explain the meaning and usefulness of database. 2.2 Illustrate the idea of database	Explain the meaning and usefulness of database. Illustrate the idea of database	Any complete system	Illustrate the idea of database	Illustrate the idea of database	Any complete system
	General Objective 2: Understand ACCESS objects and their purposes.					
2	2.1 Explain MS ACCESS objects and their purposes. 2.2 Show Typing using MS Access.	Explain different objects of MS ACCESS and their uses. Lead the students in typing a few paragraphs.	Any complete system	Illustrate typing	Illustrate typing	Any complete system
	General Objective 3: Understand how to create and Customize tables					
3	3.1 Explain how to create tables. 3.1 Explain how to customize tables	Explain how to create tables in preparing a data base. Explain how to customize tables for specific application.	Any complete system	Prepare data base	Illustrate how to prepare data base.	Any complete system

	General Objective 4 Understand how to create and edit records					
4-5	4.1 Explain how to create records 4.2 Explain how to edit records 4.3 Explain how to view records	Explain how to create records with various forms of information. Explain how to edit existing records. Explain to open record to view.	Any complete system	Create, open and edit records.	Demonstrate how to create, open and edit records.	Computers
	General Objective 5: Understand how to Preview and Print Datasheet					
6-7	5.1 Explain how to Preview datasheet. 5.2 Explain how to Print a datasheet. 5.3 Explain how to Edit and Format tables	Explain how to preview datasheet. Explain the steps in printing a datasheet.	Any complete system	Print data sheet	Demonstrate how to print data sheet	Computers
	General Objective 6 Know the concepts of Query.					
8-9	6.1 Explain the concepts of Query. 6.2 Explain the steps in sending a query to a database.	Explain the meaning and concept of query in ACCESS. Explain the steps in sending a query to a database.	Any complete system	Send a query to a database.	Illustrate sending a query to a database.	

	General Objective 7: Understand the internet history and concepts					
10	7.1 Explain the concept of internets. 7.2 Explain the History of internet operations	Explain the concept of internet operations. Explain the history of internet operations and World Wide Web WWW		Demonstrate how to use Internet		Internet Cyber Complete system.
	General Objective 8: Understand the concept and fundamentals of E-business and E-Commerce					
11-12	8.1 Explain Electronic Transfer of text. 8.2 Explain the concept of E-mail 8.3 Explain how to chat on the net 8.4 Explain the role internet in business. 8.5 Explain how to search the Net. 8.6 Explain the basics in E-business and E-Commerce.	Explain the meaning of electronic transfer of text Explain the workings of E-mail Explain how two or more people can be connected via net and communicate to each other real time. Explain how to search the Net Explain the meaning of electronic business. Explain the basis for E-business. Explain the fundamental of electronic business in general. Explain the uses of database in electronic commerce.	Any complete system	Demonstrate Computer connectivity via net. Demonstrate how to send e-mail.	Demonstrate Computer connectivity via net. Demonstrate how to send e-mail.	Any complete system

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: DATABASE MANAGEMENT I (MS SQL SERVER)

CODE: VCS 224

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students to acquire knowledge and skills in Structured Query Language (SQL) Server.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1.0	Understand Getting Started with MS SQL Server
2.0	Know how to Install SQL Server
3.0	Understand Managing Database with MS SQL Server
4.0	Understand Controlling Server and Database Security

	Theoretical Content			**Practical Content**		
	General Objective 1: Understand Getting Started with SQL Server					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-3	1.1 Explain SQL Components: Services, Editions, System and User databases. 1.2 Explain SQL Essential Tools: Management Studio, Transact-SQL, Surface Area Configuration, Configuration Manager	Explain MS SQL server as a database management system. Explain user login options with password. Explain the start and configure surface Area Manager.	Lecture notes and power point presentation.	Sign in to SQL server as existing user. Start the tools.	Use existing user name to login database server.	PC with installed MS SQL server.
	General Objective 2: Know how to install SQL Server					
4-6	1.1 Explain how to choose installation options 1.2 Explain how to employ multiple instances 1.3 Explain how to upgrade from previous version 1.4 Explain how to manipulate configuration settings 1.5 Explain how to enable network protocols	Explain system's minimum hardware and software configurations. Explain data migration from previous SQL server to current version with minimum impact on users. State network protocols supported by SQL Server e.g. TCP/IP. Explain how to start and shutdown database instance.	Lecture Notes and power point presentations	Establish connection with communication media between client and server.	Guide students to install new SQL server	PC and SQL server installation software. Installation guide.

	General Objective 3: Understand Managing Database with MS SQL Server					
7-9	1.1 Explain Disk structures: Examining storage structures, creating databases and transaction logs 1.2 Explain Space management strategies: Dynamic database growth, reclaiming unused space 1.3 Describe Moving databases: Detaching and attaching databases, using copy database wizard.	Explain database physical and logical storage structure. Explain SQL server automatic space management features. Use database migration wizard to transfer database files between systems	Lecture notes Textbook	Specify locations for database files. Choose appropriate file system for operating systems.	Create a database and PC with installed SQL server. Guide student to attach and detach the database	PC and SQL server installation software. Installation guide.
	General Objective 4: Understand Controlling Server and Database Security					
10-12	1.1 Explain Login Security: Contrasting windows and SQL Server authentications, Authorizing Logins, making login numbers of server roles, enforcing password policy 1.2 Explain relevance of Database security: Designing schemes, adding users, defining new roles, delegating privileges, assigning users to roles 1.3 Explain users permission process.	Explain roles and privilege in user administration and security. Explain how to assign or remove users. Explain different user authentication method e.g. password, biometric or operating system authentication.	Lecture note and power point presentation	Create user with a privilege and assign the user to a role. Remove the user and the database object belonging to the user.	Supervise the students	PC with installed SQL Server.

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER SYSTEM TROUBLESHOOTING II

CODE: VCS 225

DURATION: HOURS/WEEK Lecture :1hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students to have knowledge and skills to begin to repair Hardware & software.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1. Understand Serial, parallel and USB failure symptoms
2. Understand printers failure symptoms problems
3. Understand dial up failure symptoms problems
4. Understand common start-up failure symptoms
5. Understand illegal operational failure symptoms
6. Understand virus protection utility failure symptoms
7. Understand networks failure symptoms
8. Understand external devises failure symptoms

	Theoretical Content			**Practical Content**		
	General Objective: 1. Uderstand Serial, parallel and USB problems					
Week/s	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Explain how to recognise POST error message code as serial, parallel and USB failure. 1.2 Explain the cause of serial, parallel and USB port failure.	Explain how to recognise POST error message code as serial, parallel and USB failure. Explain Serial, parallel and USB failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a serial, parallel and USB problem. Rectify the serial, parallel and USB problem by reinsertion or replacement	**To help student to** : Recognise POST error message code as an indication of a serial, parallel and USB problem. Rectify the serial, parallel and USB problem by reinsertion or replacement	Personal computer loaded with diagnostics packages
	General Objective: 2. To understand printers failure symptoms problems					
2-3	1.1 Explain the cause of printer's failure. 1.2 Describe how to rectify faults in printers.	**To explain:** How to recognise POST error message code as printer's failure. List possible: Hardware faulty: E.g. connection problems. Power fault Software faulty: E.g. driver installation Conflict Printer's failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a printer's problem. Rectify the printers problem by reinsertion or replacement	**To help student to** : Recognise POST error message code as an indication of a printer's problem. Rectify the printers problem by reinsertion or replacement	Personal computer loaded with diagnostics packages

	General Objective: 3. Understand MODEM failure symptoms problems					
4	1.1 Explain the cause of MODEM failure. 1.2 Explain how to rectify MODEM failure.	Explain how to recognise POST error message code as MODEM failure. MODEM failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a MODEM problem. Rectify the MODEM problem by reinsertion or replacement Rectify software problems by re-installation.	**To help student to** : Recognise POST error message code as an indication of a MODEM problem. Rectify the MODEM problem by reinsertion or replacement Investigate a possible hardware faults.	Personal computer loaded with diagnostics packages
	General Objective: 4. Understand common windows start-up failure symptoms					
5-6	1.1 Explain the cause of windows start-up failure. 1.2 List possible software possible: E.g. Missing file, Conflict Windows start-up failure remedy	Explain how to recognise POST error message code as windows start-up failure. List possible software possible: E.g. Missing file. Conflict Windows start-up failure remedy	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a windows start-up problem. Rectify the windows start-up problem by reinsertion or replacement	**To help student to** : Recognise POST error message code as an indication of a windows start-up problem. Rectify the windows start-up problem by reinsertion or replacement	Personal computer loaded with diagnostics packages

	General Objective:5. Understand illegal operational failure symptoms					
7-8	1.1 Explain the cause of illegal operational failure. 1.2 Explain how to recognise POST error message code as illegal operational failure. 1.3 Explain how to rectify fault.	Explain how to recognise POST error message code as illegal operational failure. Illegal operational failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a illegal operational problem. Rectify the illegal operational problem by reinsertion or replacement	**To help student to** : Recognise POST error message code as an indication of a illegal operational problem. Rectify the illegal operational problem by reinsertion or replacement	Personal computer loaded with diagnostics packages
	General Objective: 6. Understand virus protection utility failure symptoms					
9	1.1 Explain the cause of virus protection utility failure. 1.2 Explain **h**ow to recognise POST error message code as virus protection utility failure. 1.3 Explain virus protection utility failure remedy. 1.4 Explain how to rectify fault.	Explain **h**ow to recognise POST error message code as virus protection utility failure. Explain virus protection utility failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a virus protection utility problem. Rectify the virus protection utility problem by reinsertion or replacement	**To help student to** : Recognise POST error message code as an indication of a virus protection utility problem. Rectify the virus protection utility problem by reinsertion or replacement	Personal computer loaded with diagnostics packages

	General Objective: 7. Understand networks failure symptoms					
10	1.1Explain the cause of networks failure. 1.2 Explain how to recognise POST error message code as networks failure. 1.3 Explain Networks failure remedy.	Explain how to recognise POST error message code as networks failure. Explain Networks failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a networks problem. Rectify the networks problem by reinsertion or replacement	**To help student to** : Recognise POST error message code as an indication of a networks problem. Rectify the networks problem by reinsertion or replacement	Personal computer loaded with diagnostics packages
	General Objective:8. To understand external devises failure symptoms					
11-12	1.1Explain the cause of external devises failure. 1.2 Explain how to recognise POST error message code as external devises failure. 1.3 List possible hardware faulty: E.g. flash disk not detected. Scanner failure External DVD not detected. External devises failure remedy.	Explain how to recognise POST error message code as external devises failure. List possible hardware faulty: E.g. flash disk not detected. Scanner failure External DVD not detected. External devises failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	Recognise POST error message code as an indication of a external devises problem. Rectify the external devises problem by reinsertion or replacement	**To help student to** : Recognise POST error message code as an indication of an external devises problem. Rectify the external devises problem by reinsertion or replacement	Personal computer loaded with diagnostics packages

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: WEB DESIGN AND DEVELOPMENT II (PHP)

CODE: VCS 226

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students to acquire knowledge and skills in server-side scripting language using Hypertext Processor (PHP).

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1. Understand the general background knowledge and meaning of PHP.
2. Know the basic syntax of PHP.
3. Understand form and user input.
4. Understand user define and in-built functions in PHP.
5. Know how to keep track of communication between server and client using sessions and cookies.
6. Understand how to handle e-mail.
7. Know how to handle errors and exceptions.
8. Know how to connect to and process data from database server.

Course Specification: Theoretical & Practical Content				**Practical Contents:**		
Week	**Specific Learning Objective**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objectives**	**Teachers Activities**	**Learning Resources**
	General Objective 1.0: Understand the general background knowledge and meaning of PHP					
1	1.1 Explain PHP as server-side scripting language 1.2 Describe why we use PHP 1.3 Describe how to install PHP	Explain server – side scripting language. Explain client – server communication on the Internet.	www.w3 schools.com	Identify a web page with PHP script. That is having PHP extension	Guide students on how to browse a web page containing PHP script.	Internet connection and PC. PHP installation software.
	General Objective 2.0: Know the basic syntax and semantics of PHP					
2-3	2.1 Explain Basic PHP syntax Describe how to insert comments 2.2 Explain variable declarations and initializations. 2.3 Describe PHP operators (arithmetic, logical, comparison and assignment). Conditional statements (if …else, elseif ….., switch statement). 2.4 Describe how to declare and use numeric array, associative array, and multi-dimensional arrays. 2.5 Describe PHP looping (while, do….while, foreach and foreach).	Explain PHP syntax as it relates to a programming language. Explain the building block of PHP with condition testing, looping and variable initialization. Explain when to use numeric associative and multi-dimensional arrays with examples.	Textbook and www.3school.com	Write PHP codes with the condition testing, looping and variable declaration and initialization.	Assist students to identify errors in their scripts and necessary debugging method.	PC with installed PHP engine. Configure IIS Install Apache web server.
	General Objective 3.0: Understand form and user input					
4-5	3.1 Describe how to use $_GET, $_POST, and $_REQUEST variables to collect values from form. 3.2 Explain how to validate user's input at client side.	Explain the difference between action = post and action = get in HTML form. Explain how to use Java script to validate user's input.	Textbooks and Online resources.	Write a simple HTML form with at least two fields. The content of the form should be validated at client side before sending for PHP processing.	Assist student to debug errors in their scripts.	PC with installed PHP software.

	3.3 Explain how to create an upload-file form. 3.4 Explain how to write the upload script define, restriction on upload and save the uploaded file.	Explain how file is uploaded to web server using either HTTP or FTP protocol and how to save the file.				
	General Objective 4.0: Understand user define and in-built functions in PHP					
6-7	4.1 Describe how to declare a user-define function 4.2 Describe how to pass parameters to a function 4.3 Describe how to handle return values 4.4 Describe hot to work with timestamp. 4.5 Explain PHP date() function to format value in specific date format. 4.6 Explain the use, similarities and differences between include() and require() functions in copying file. 4.7 Explain File processing functions such as fopen(), fclose(), feof(), fgetc(), fgets() functions to open a file.	Explain how to declare function and difference between user-define function and built-in functions. Explain how date and time are stored and retrieved.	Textbook and online resources.	Identify user – define function with formal parameters. Change numeric values to specific date format. Display current date on a web page using date( ) function. Store and retrieve data with file processing functions.	Guide students on how to use file processing function and debugging their script.	PC with installed PHP.

	General Objective 5.0: Know how to keep track of communication between server and client using sessions and cookies					
8	5.1 Explain cookies and sessions. 5.2 Create cookies, retrieve and delete cookies. 5.3 Explain how to start PHP session with session_start(), store the session variables with $_SESSION, and destroy the session with session_destroy() or unset().	Explain client – server communication on the Internet using session and cookies. Explain the procedures required to terminate a session.	Online resources and textbook	Write a script that will allow users to communicate with web server at the same time. The script should be able to keep track of individual users state.	Host the script on web server and monitor users state.	PC with installed PHP. Internet or local area connection.
	General Objective 6.0: Understand how to handle e-mail					
9-10	6.1 Explain PHP e-mail handling capabilities. Describe e-mail function, mail(), and its formal paramenters. 6.2 Explain secure e-mail by stopping e-mail injection with input validation. 6.3 Write simple feedback the will acknowledge user's comment.	Explain e-mail as Internet resources that facilitate communication. Explain how e-mail can be automatically sent using PHP when user complete feedback form. Explain input validation to enhance security.	Online resource	Create a simple script that will acknowledge user's comment about a web page.	Assist the students to debug error in their script.	PC with installed PHP engine.
	General Objective 7.0: Know how to handle errors and exceptions					
11	7.1 Explain errors handling types (basic with die() function and custom with error_function()) and error handlers. 7.2 Describe error logging and how to send error by e-mail. 7.3 Explain exception and how to throw or re-throw an	Explain error as a meaning information to user as a server side problem. Explain exception as error arising from user input. Explain implications of errors and exceptions in script execution.	Online resources.	Write a script with deliberate server side error. Write script that can handle user's input using appropriate error handling methods with try { }, catch () { } blocks.	Assist the student with examples on user error handling.	PC with PHP engine.

	exception, including the try{} catch(){} blocks. Describe how to create custom exception.					
	General Objective 8.0: Know how to connect to and process data from database server					
12	8.1 Explain the similarities between PHP and MySQL database. 8.2 Describe how to connect PHP to MySQL with mysql_connect() function and close the connection. 8.3 Explain how to query and manipulate data in MySQL database.	Explain relationships between PHP and My SQL data types. Explain the proper sequence to establish connection with My SQL. Use simple query statements to access, manipulate and update database content through PHP.	Textbook and Online resources	Install My SQL database. Configure My SQL and PHP engine. Demontrate plat form dependency when installing My SQL and PHP engine.	Assist student with My SQL database installation.	My SQL database software PC with PHP engine.

PROGRAMME:	NVC IN COMPUTER SCIENCE
MODULE:	BASIC NETWORKING
CODE:	VCS 227
DURATION:	HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs
UNITS:	3 Units

GOAL: This module is intended to provide the learner with knowledge of computer networking

GENERAL OBJECTIVES: On completion of this course the students should be able to:

1.0 Know the common types of network cables, their characteristics and connectors

2.0 Know basic networking concepts including how a network works

3.0 Understand common technologies available for establishing Internet connectivity and their characteristics

4.0 Understand Concept of Structured Cabling

5.0 Understand Procurement of Plastic trunks (Raceways)

6.0 Understand Wall Breaking and Installation of Outlines

7.0 Understand Planning Position of PCS for ease of Connection

8.0 Know Adding Structured Cabling design during building design and Construction

COURSE SPECIFICATION: Theoretical Contents:				**Practical Contents**:		
	General Objective 1: Know the common types of network cables, their characteristics and connectors			**General Objective**:		
WEEK	**Specific Learning Objective**	**Teachers Activities**	**Learning Resources**	**Specific Learning Objective**	**Teachers Activities**	**Learning Resources**
1	1.1 Explain Cable Types including Coaxial RG6 RG8 RG58 RG59 Plenum/PVC UTP CAT3 CAT5/e CAT6 STP Fiber Single-mode Multi-mode Connector types include: BNC RJ-45 AUI ST/SC IDC/UDC	Explain 1.1	Various types of cables Multimedia Projector	Identify different types of cables	Demonstrate and help to identify cables	Various types of cables Multimedia Projector

	General Objective 2**:** Know basic networking concepts including how a network works					
2	2.1 Explain basic networking concepts including: ▸ Installing and configuring network cards ▸ Addressing ▸ Bandwidth ▸ Status indicators ▸ Protocols: o TCP/IP o IPX/SPX (NWLINK) o Apple Talk o NETBEUI/NETBIOS ▸ Full-duplex, half-duplex ▸ Cabling – Twisted Pair, Coaxial, Fiber Optic, RS-232 ▸ Networking models: o Peer-to-peer o Client/server ▸ Infrared ▸ Wireles	Explain 2.1	Stand alone Computers	Install a simple network of systems using cables	Demonstrate installation	Stand alone computers
	General Objective 3**:** Understand common technologies available for establishing Internet connectivity and their characteristic					
3-4	3.1 Explain the following Technologies : ▸ LAN ▸ DSL ▸ Cable ▸ ISDN ▸ Dial-up ▸ Satellite ▸ Wireless 3.2 Describe Internet connectivity, characteristic and speed	Explain the following Technologies : ▸ LAN ▸ DSL ▸ Cable ▸ ISDN ▸ Dial-up ▸ Satellite ▸ Wireless 3.2 Describe Internet connectivity, characteristic and spee		Demostrate a simple internet connectivity	Supervise activity.	Stand alone computers

	General Objective 4. Understand Concept of Structured Cabling					
5-6	4.1 Explain Concept of Structured Cabling. 4.2 Define structured cabling. 4.3 State Merits of Structured Cabling.	State the Meaning of Structured Cabling. Explain the purpose of Structured Cabling. Highlight its Merits.	Use Cables, Hubs, Switches Routers.	Carryout Structural Cabling.	Should assist students by showing them a practical example.	Cables, Hubs, Switches, Routers.
	General Objective 5**:** Understand Procurement of Plastic trunks (Raceways)					
7-8	5.1 Explain Procurement of plastic trunks. 5.2 Discuss its purpose	Discuss the meaning and purpose of raceways.		Identify types of trunks in terms of size.	Should guide students	
	General Objective 6: Understand Wall Breaking and Installation of Outlines					
9-10	6.1 Explain Concept of Wall Breaking and Installation of Outlines.	Discuss what is meant by Wall Breaking and Installation of Outlines.	Chisel, Hammer, Drillers.	Carryout Wall Breaking and Installation of Outlines	Should take students to a site to Network.	Drillers Hammer Chisel.
	General Objective 7: Understand Planning Position of PCS for ease of Connection					
11	7.1 Explain planning position of PCs for ease of Connection .	Illustrate planning position of PCs for ease of Connection.	Practical hands on.	Demonstrate PCs placement properly for ease of connection.	Should guide students through practicals	Operating systems, NICs, Modems.
	General Objective 8: Know Adding Structural Cabling design during building design and Construction					
12	8.1 Discuss Structural Cabling design during Building design and Construction. 8.2 Identify types of Cabling e.g. UTP, STP, Conxial, Fibre optics and types of connectors.	Identify types of Cabling e.g. UTP, STP, Conxial, Fibre optics and types of connectors.	The various types of Cable.	Illustrate Structured Cabling design practically.	Learn to handle the cables e.g. crimping, splicing etc.	UTP, STP Coax, fibre optic cables RJ US Connectors SNC, FC, N-type connectors.

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: TYPING SKILL III

CODE: VCS 311

DURATION: HOURS/WEEK Lecture: 1 hrs Tutorial: 0 Practical: 3 hrs

UNITS: 3 Units

GOAL: This module is designed to equip the students with the ability to type day-to-day office assignments and also acquire a copying rate of 35 wpm on passages not below 1.3 syllabic intensity with 98% accuracy.

GENERAL OBJECTIVES: On completion of this module the leaner should be able to:

1. Know how to type accurately a ten minute passage at 35 wpm with 98% accuracy.
2. Know how to type advanced manuscripts properly.
3. Understand the correct use of combination signs and characters.
4. Know how to use continuation sheets.
5. Know how to type headings in various arrangements e.g. columnar, main and sub-heading.
6. Know how to type notices of meetings, agenda and Chairman's agenda.
7. Know how to types minutes.
8. Know how to type various reports.
9. Understand the techniques of typing literary work.
10. Understand the procedures for typing statistical work.
11. Understand the procedures for typing technical work.
12. Know how to type accurately at 40 wpm with 1.3 intensity at 98% accuracy and consolidation.

General Objective 1.0: Know how to type accurately a ten minute passage as 35 wam with 98% accuracy.						
Theoretical Content			Practical Content			
WEEK	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1	1.1 Explain how to type accurately a ten minute passage as 35 wam with 98% accuracy.	Explain how to type accurately a ten minute passage as 35 wam with 98% accuracy.	Computer/ Typing packages. Textbooks, stopwatch.	2.1 Produce speed drills for short periods. 2.2 Produce corrective drills. 2.3 Produce timed speed drills of 5-15 minutes duration. 2.4 Produce accurately for 10 minutes a passage of 1.3 S.1 with 98 accuracy	Time students for 10 minutes for the speed/accuracy. Provide relevant exercises for practice. Observe students at work and evaluate.	Computer/ Typing packages. Textbooks, stopwatch.
General Objective 2.0: Know how to type advanced manuscripts properly.						
2	2.1 Explain how to type advanced manuscripts properly. 2.2 Identify and give advance manuscripts containing difficult correction signs.	Explain how to type advanced manuscripts properly. Identify and give advance manuscripts containing difficult correction signs.	Computer Typing packages	3.1 Produce advanced manuscript/ typescripts containing different correction signs. 3.2 Carry out all necessary corrections before removing work the system.	Identify and give advance manuscripts containing difficult correction signs. Observe students at work. Grade student's work.	Computer Typing packages

General Objective 3.0: Understand the correct use of combination signs and characters						
3	3.1 Explain how to type various combination signs e.g. single dagger, double dagger, caret, brace, division sign,asterisk, section signs. 3.2 Explain the various special monetary symbols e.g. ₦ (Naira), £ (pound sign) $ (dollar sign) and others.	Explain how to type various combination signs e.g. single dagger, double dagger, caret, brace, division sign,asterisk, section signs. Explain the various special monetary symbols e.g. ₦ (Naira), £ (pound sign) $ (dollar sign) and others.	Computer Typing packages	4.1 Produce various combination signs. 4.2 Produce various monetary symbols.	Explain how to type various combination signs e.g. single dagger, double dagger, caret, brace, division sign,asterisk, section signs. Explain the various special monetary symbols e.g. ₦ (Naira), £ (pound sign) $ (dollar sign) and others. Provide materials for practice Grade students work.	Computer Typing packages .
General Objective 4.0: Know how to use continuation sheets.						
4	4.1 Explain the use of continuation sheet and catchwords	4.1 Explain the use of continuation sheet and catchwords	Computer Typing packages	5.1 Produce documents containing continuation sheets correctly.	Explain the use of continuation sheet and catchwords (not page number of the next page). Provide materials for practice. Observe students at work and evaluate.	Computer Typing packages

General Objective 5.0: Know how to type headings in various arrangement e.g. columnar, main and sub-heading.						
5	5.1 Explain the necessary calculations for tabular work involving vertical headings, diagonal headings, main and sub-headings.	Explain the necessary calculations for tabular work involving vertical headings, diagonal headings, main and sub-headings.	Computer Typing packages	Type correctly tabular work involving vertical headings, diagonal heading, main and sub-headings.	Explain the necessary calculations for tabular work involving vertical headings, diagonal headings, main and sub-headings. Provide relevant materials for practice. Observe students at work and evaluate.	Computer Typing packages
General Objective 6.0: Know how to type notices of meetings, agenda and Chairman's agenda.						
6	6.1 Explain how notice of meetings are typed. 6.2 Explain how Agenda is typed. 6.3 Explain how Chairman's Agenda is typed.	Explain how notice of meetings are typed. Explain how Agenda is typed. Explain how Chairman's Agenda is typed.	Computer Typing packages	6.1 Type notice of meetings. 6.2 Type Agenda. 6.3 Type Chairman's Agenda	Explain how notice of meetings are typed. Explain how Agenda is typed. Explain how Chairman's Agenda is typed. Provide exercise for practice. Observe students at work.	Computers, Typing packages.

General Objective 7.0: Know how to type minutes of meetings.						
7	7.1 Explain the different styles of rendering minutes of meeting. - Paragraph - Shoulder - Side heading	Explain the different styles of rendering minutes of meeting. - Paragraph - Shoulder - Side heading	Computer Typing packages	7.1 Type minutes of meeting using these styles: 7.2 Paragraph headings. 7.3 Shoulder headings. 7.4 Side headings. 7.5 Produce minutes of the class meeting. 7.6 Type summary of meeting decisions.	Explain the different styles of rendering minutes of meeting. - Paragraph - Shoulder - Side heading Organise a meeting of the class. Provide materials for practice. Provide summary of meeting decisions. Explain how to type them. Provide materials for practice. Observe and grade students' work.	Computer Typing packages
General Objective 8.0: Know how to type various reports.						
8	8.1 Explain the need for and how to type reports.	Explain the need for and how to type reports.	Computer Typing packages	8.1 Type reports.	Explain the need for and how to type reports. Differentiate reports from minutes.	Computer Typing packages

					Provide materials for practice. Observe and grade students' work.	
General Objective 9.0: Understand the techniques of typing literary work.						
9	9.1 Explain how to type stories. 9.2 Explain dropped headings. 9.3 Explain how to type speeches.	Explain how to type stories. Explain dropped headings. Explain how to type speeches.	Computer Typing packages	9.1 Type stories. 9.2 Type plays. 9.3 Type speeches. 9.4 Type poems.	Explain how to type stories. Show the correct way of typing plays. Explain dropped headings. Provide appropriate materials for practice and observe them at work. Explain how to type speeches. Show the influence of rhyme structure in typing poems. Provide appropriate materials for practice and observe students at work.	Computer Typing packages

					Grade student work.	
General Objective 10.0: Understand the procedures for typing statistical works.						
10	10.1 Explain the procedure for typing statistical works. 10.2 Explain the use of, and types of Leader dots.	Explain the procedure for typing statistical works. Explain the use of, and types of Leader dots.	Computer Typing packages	10.1 Type balance sheets. 10.2 Type statement of account.	Explain the procedure for typing statistical works. Explain the use of, and types of Leader dots. Give students work to do in the classroom and observe them at work. Grade students' work.	Computer Typing packages
General Objective 11.0: Understand the procedure for typing technical work.						
11	11.1 Explain the procedure for typing Bills of Quantities and specifications. 11.2 Explain legal terms such as conveyance, draft, contract, deed, will, statement of claim endorsement, engrossment, attestation clause, document under seal, executor, etc.	Explain legal terms such as conveyance, draft, contract, deed, will, statement of claim endorsement, engrossment, attestation clause, document under seal, executor, etc.	Computer Typing packages	11.1 Type specifications. 11.2 Type Bills of Quantities. 11.3 Type wills, contracts, agreements, and other legal documents.	Explain the procedure for typing Bills of Quantities and specifications. Provide appropriate material for practice and observe them at work. Explain legal terms such as conveyance, draft, contract, deed, will, statement of claim, document under seal, executor, endorsement,	Computer Typing packages

	Explain the layout used in typing legal documents of margins, line spacing, pagination, continuation sheets, type of paper, erasure, endorsement, etc.	Explain the layout used in typing legal documents of margins, line spacing, pagination, continuation sheets, type of paper, erasure, endorsement, etc.	Computer Typing packages		attestation clause, engrossment, etc. Explain the layout used in typing legal documents of margins, line spacing, pagination, continuation sheets, type of paper, erasure, endorsement, etc. Give students assignment based on what was learnt and observe them at work. Grade students' work.	Computer Typing packages - ditto -
General Objective 12.0: Know how to type accurately at 40 wam with 1.3 S.1 at 98% accuracy and consolidation.						
12	12.1 Explain how to type accurately at 40 wam with 1.3 S.1 at 98% accuracy and consolidation.		Computer Typing packages	12.1Type speed drills for short period. 12.2Type corrective drills. 12.3 Type accurately from printed materials.	Provide materials for speed drills. Provide passages. Emphasise absence of erasure. Emphasise double line spacing. Select appropriate materials based on	Computer Typing packages Computer

			Computer Typing packages	12.4 Type timed speed drills for timings of 5-15 minutes duration. 12.5 Type accurately for 10 minutes a passage of 1.3 syllabic intensity with 98% accuracy.	work covered. Grade students work.	Typing packages

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: DATABASE DESIGN

CODE: VCS 312

DURATION: HOURS/WEEK Lecture: 2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students understand the principles of DATABASE Design.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1. Know the general concept of database and Database Management (DBM)
2. Know database structure
3. Understand database implementation
4. Know the procedure for setting up simple database
5. Know database operation

	Theoretical Content			**Practical Content**		
	General Objective 1: Know the general concept of Database					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-2	1.1 Define data 1.2 Define data repositories – files 1.3 Explain Database as a collection of related files 1.4 Explain Database Management System (DBMS) 1.5 Describe user interfaces to Database Management Systems 1.6 State the advantages and disadvantages of database Systems	• State the meaning of data • Define data repository files • Explain Database • Explain Database Management System • Explain user interfaces to Database Management Systems • State the advantages and disadvantages of database Systems	Magic board Diagrams Computer system MS Access			
	General Objective 2: Know Database structure					
3-5	2.1 Define relations, domains and data model 2.2 Describe the structure of a database in terms of: Interfile relationships, multiple files and database models 2.3 Illustrate the following database structure: hierarchical, network and relational. 2.4 Define with aid of diagrams	• Demonstrate the following data structure: hierarchical, network and relational • Demonstrate schemes with diagrams • Define with aid of diagrams data elements and records • Define data	Magic board Diagrams Computer system MS Access	Demonstrate the following data structure: hierarchical, network and relational Demonstrate schemes with diagrams	Supervise activity	Complete systems.

	data elements and records 2.5 Define data independence, structure independence and programme independence	independence, structure independence and programme independence				
	General Objective 3: Understand Database Implementation					
6-8	3.1 Explain naming of data elements, information hiding and security, single and multiple applications of data base systems and host language services 3.2 Describe database control	• Explain naming of data elements, information hiding and security, single and multiple applications of data base systems and host language services • Describe database control	Magic board Diagrams Computer system	Demonstrate naming of data elements, information hiding and security, single and multiple applications of data base systems and host language service	Supervise activity	Magic board Diagrams Computer system
	General Objective 4: Know the procedure for setting up simple Database					
9-10	4.1 Describe how to develop a database using any available package (DBMS) 4.2 Describe how to document the system developed in 4.1 above 4.3 Describe the functions of a Database Administrator	Demonstrate how to develop a database using any available package (DBMS) List how to document the system developed in 4.1 above Describe the functions of a Database Administration	Magic board Diagrams Computer system	Demonstrate how to develop a database using any available package (DBMS) Demonstrate how to document the system developed in 4.1 above	Supervise activity	Magic board Diagrams Computer system

	General Objective 5: Know Database operation					
11-12	5.1 Describe query language QBE, SQL, etc. 5.2 Apply the language in 5.1 above on a database to: insert, retrieve, update, etc. 5.3 Carry out maintenance on a database file to specifications	• Explain query language: QBE, SQL, etc. • Apply the language in 5.1 above on a database to: insert, retrieve, update, etc. • Carry out maintenance on a database file to specifications • Explain database and describe the query language: QBE, SQL, etc. • Guide the students to apply query language in database to insert, retrieve, update, etc. • Guide the students to carry out maintenance on a database file	Magic board Diagrams Computer system	Carry out maintenance on a database file to specifications Carry out maintenance on a database file to specifications	Supervise activity	Magic board Diagrams Computer system

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: DATABASE MANAGEMENT II (ORACLE)

CODE: VCS 313

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students to acquire knowledge and skills in Oracle Language.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1.0	Understand how to manage an Oracle Instance
2.0	Know how to Create a Database
3.0	Understand using the Data Dictionary
4.0	Know how to Maintain the Control File

	Theoretical Content			**Practical Content**		
	General Objective 1: Understand how to manage an Oracle Instance					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-3	1.1 Explain the basic requirements for interacting with Oracle Database Files: - Valid user - Space Allocation - Privilege 1.2 Explain the steps involved in creating files in Oracle. 1.3Explain the: - Shutdown normal - Shutdown immediate - Shutdown transaction - Shutdown Abort options - Shutting down an instance. 1.4 Explain monitor threshold and monitor listener in formation.	Explain the basic requirements for interacting with Oracle Database Files: - Valid user - Space Allocation - Privilege Explain the steps involved in creating files in Oracle. Explain the: - Shutdown normal - Shutdown immediate - Shutdown transaction - Shutdown Abort options - Shutting down an instance. Explain monitor threshold and monitor listener in formation.	A Computer system equipped with 10 G Oracle software.	Demonstrate the process and steps involved in: - creating and managing files in oracle. - shutting down an instance. Demonstrate the procedures involved in monitoring threshold and listener information	Observe students created files in oracle and implement file manageme nt activities Oversee students use various options mentioned to shut down an instance.	A Computer system equipped with 10 G Oracle software.
	General Objective 2: Know how to Create a Database					
4-6	1.1 Explain the Procedures involved in launching Database Configuration Assistance automatically to create a Database.	Explain the Procedures involved in launching Database Configuration Assistance automatically to create a Database.	A Computer system equipped with 10G oracle software.	Demonstrate the procedures involved in launching the	Allow student launch the Database Configurati	A Computer system equipped with 10G

	1.2 Explain the use of SQL statements or ISQL *plus in creating a Database manually.	Explain the use of SQL statements or ISQL *plus in creating a Database manually.		Database Configuration assistance automatically Demonstrate the use of SQL statements or ISQL *plus in creating a Database.	on assistance. Allow the students practice the use of SQL statements or ISQL* plus in creating a Database.	oracle software.
	General Objective 3: Understand using the Data Dictionary					
7-9	3.1 Identifying the uses and contents of the data dictionary 3.2 Explain, using the data dictionary , how to retrieve information above the database	Explain the use of Data dictionary as the central source of information for all the objects. Explain the contents of Data dictionary to include: index, views, tables and sequence. Explain the use of Query command in retrieving information from the Database.	A Computer system equipped with 10G Oracle software.	Demonstrate the uses of tables, index sequence and views as objects. Demonstrate the use of Query Command in retrieving information from the Database.	Oversee students work with Database objects such as index, tables, views, sequence, etc.	A Computer system equipped with 10G Oracle software.
	General Objective 4: Know how to Maintain the Control File					
10-12	4.1 Explain the uses of the control file 4.2 List the contents of the control file 4.3 Explain Multiplexing the control file	* Explain the use of the control file in initialization of information. * Explain the contents of control file to include location of other files such	A Computer system equipped with 10G Oracle software.	Demonstrate the use of the control file in initialization of information.	Allow students perform initialization of informati	A Computer system equipped with 10G Oracle

	4.4 Explain how to manage control file with Oracle Managed Files (OMF) 4.5 Describe how to obtain control file information	as Datafile Online Redo log files and Archive log file. * Explain multiplexing the control file as making duplicate copies of control files. * Explain Backing up files and Standardizing naming formats of oracle files. * Explain the process involved in Querying Data dictionary files.	A Computer system equipped with 10G Oracle software.	Demonstrate the steps involved in making duplicate copies of control files. Demonstrate the steps involved in Querying Data dictionary files.	on using control file. Allow students follow the practical steps demonstrated to produce duplicate copies of control files. Allow students Query Data dictionary files.	software.

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: ETHICS AND PRACTICE IN IT

CODE: VCS 314

DURATION: HOURS/WEEK Lecture :1hrs Tutorial: 0 Practical: 2hrs

UNITS: 2 Units

GOAL: This module is designed to enable students to acquire knowledge on Information Technology

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

General Objectives

1. Understand how to search and select appropriate information
2. Know awareness of legal and ethical issues for the IT practitioner
3. Know how to relate professional issues to their own practice
4. Understand and apply the principles of group working
5. Know the quality management process
6. Know how to prepare for the job application process
7. Know how to make a successful presentation

	Theoretical Content			**Practical Content**		
	General Objective 1: Understand how to search and select appropriate information					
Week/s	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1-2	1.1 Compare different types of information 1.2 Describe different sources of information 1.3 Explain the need for validating information and list appropriate criteria	Explain the nature of information, for example, data, information, knowledge, understanding Describe different types and sources of information Describe the search process and different techniques Discuss criteria for assessing information based upon both the context of the author and the needs of the user	White board A variety of information sources for demonstrating search techniques	Search for, retrieve and validate information appropriately in response to a defined need Discuss information retrieval in relation to "Fitness for purpose"	Supervise activities	Internet Examples of information from a variety of sources eg newspaper, commercial website, textbook, academic paper

	General Objective 2: Know how to demonstrate an awareness of legal and ethical issues for the it practitioner					
3	2.1 Explain the need for a legal framework and relate it to moral and ethical ones 2.2 Compare IT-related laws in different countries	Explain morals, ethics and laws Describe the Libyan legal system and highlight laws relating to IT practice Describe IT-related laws in other countries	Whiteboard Examples of IT-related laws from eg other Arabic countries, UK, USA	Discuss the implications for IT practitioners of IT-related laws both in their own country and overseas Discuss the implications of ethical and moral standards for IT practitioners	Supervise activities	Whiteboard Internet Examples of IT-related laws from eg other Arabic countries, UK, USA
	General Objective 3: Know how to relate professional issues to their own practice					
4	3.1 Explain the need for professional standards 3.2 Explain the role of professional bodies	Explain the concepts of a profession and a professional Describe professional bodies using an example such as the British Computer Society Explain a Code of Conduct	Whiteboard Example of a Professional body eg British Computer Society www.bcs.org.uk	Discuss issues of professionalism and relate these to their own practice		

	General Objective 4: Understand and apply the principles of group working					
5-6	4.1 Describe the dynamics of a group and the role of different members 4.2 Describe the stages of group formation	Describe: Group roles eg Belbin Group formation		Assess their own contribution to a group and those of others Discuss the implications of group theories for IT projects		
	General Objective 5: Know how to explain the quality management process					
7-8	5.1Explain the need for quality management within the field of IT 5.2 Explain the need for standards and defined processes by describing examples of good and bad practice 5.3 Explain the need for quality assurance	Explain the meaning of quality in the context of IT products and IT projects eg to specification, on time, within budget Describe different types of system eg business information and safety critical systems Explain the need for a quality program and the three stages of quality management (defined standards	Whiteboard Examples of unsuccessful projects eg European Space Agency	Compare a successful project to a successful product Explain the concept of quality improvement and describe ways of implementing this	Introduce examples of 'successful' and 'unsuccessful' projects Explain the term "Fitness for Purpose" Describe a range of approaches to quality improvement eg ISO9001, SEI, quality circles	Whiteboard Internet Examples

		and processes, quality assurance, quality improvement)				
	General Objective 6: Know how to prepare for the job application process					
9-10	6.1 Describe and compare roles within the IT profession 6.2 Outline the IT job market	Explain the characteristics (including abilities and career paths) of roles within the IT profession Describe the IT job market		Create an effective curriculum vitae Write a covering letter tailored a job vacancy Prepare for an interview Perform a career based self-assessment Discuss their career aspirations	Explain the job application process: advertisement, CV and covering letter, interview and aptitude tests, job offer and acceptance Explain the structure and content of a good CV Explain how to tailor a covering letter to a job specification	Example CVs Sample job advertisements and example covering letters Sample job advertisements for exercise
	General Objective 7: Know how to make a successful presentation					
11-12	7.1 Describe the criteria of a good presentation 7.2 Explain the elements and structure of a good presentation and the role of media in supporting presentations	Demonstrate examples of bad and good presentations Explain the elements and structure of a good presentation and the role of media in supporting presentations		Prepare and make effective presentations		Whiteboard Presentation software Exercise

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER GRAPHICS AND ANIMATION

CODE: VCS 315

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students to have concept of computer graphics and animation.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1.0	Know the basic concept of computer graphics.
2.0	Know the concept of interactive graphics.
3.0	Know the Mathematics for two-dimensional computer graphics.
4.0	Understand the concept of raster graphics.
5.0	Know two-dimensional transformations.
6.0	Know graphics input/output.
7.0	Know available graphics facilities.
8.0	Know graphic packages.
9.0	Know graphic packages

	Theoretical Content			**Practical Content**		
	General Objective 1: Know the basic concept of computer graphics					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Explain the concept of graphics. 1.2 Explain the origin of computer graphics 1.3 Define a picture element: block pixel, and 1.4 Explain the techniques of clipping, geometric transformation and incremental methods.	--Explain the concept of graphics. --Explain the origin of computer graphics --Define a picture element: block pixel, and --Explain the techniques of clipping, geometric transformation and incremental methods.	--A PC loaded with a graphic packages such as , Auto cards and coreldraw and connected to an OHP. --Reference manual on graphic packages .	Explore graphic packages and Understand their characteristics	To assist student explore graphic packages	A PC loaded with a graphic packages in a networked laboratory
	General Objective 2: Know the concept of interactive graphics					
2	2.1 Explain interactive graphics 2.2 Explain the two basic types of graphical interactions; pointing and positioning 2.3 Explain event handling; polling; interrupts and event queue. 2.4 Explain input functions dragging and fixing hit detection and on-line character recognition.	-- Explain interactive graphics --Explain the two basic types of graphical interactions; pointing and positioning --Explain event handling; polling; interrupts and event queue. --Explain input functions dragging and fixing hit detection and on-line character recognition.	--A PC loaded with a graphic *packages such as , Auto cards and corel draw and connected to an OHP.* --Reference manual on graphic packages .	Explore graphic packages and understand their characteristics	To assist student explore graphic packages	A PC loaded with a graphic packages in a networked laboratory

	General Objective 3: Understand the Mathematics for two-dimensional computer graphics					
3	3.1 Explain the two-dimensional Cartesians coordinate system. 3.2 Explain the polar-coordinate system 3.3 Explain vectors 3.4 Explain Matrices 3.5 Explain Functions and transformations.	Explain the two-dimensional Cartesians coordinate system. -- Explain the polar-coordinate system --Explain vectors --Explain Matrices --Explain Functions and transformations.	--A PC loaded with a graphic *packages suchas , Auto cards and coreldraw and connected to an OHP.* --Reference manual on graphic packages .	Write program involving two dimensional cartessian and polar coordinate system	To assist student in writing program involving two dimensiona l cartessian and polar coordinate system	. A PC loaded with a graphic packages in a networked laboratory
	General Objective 4: Understand the concept of raster graphics					
4	4.1 Explain the concept of raster graphic fundamentals 4.2 Describe a raster image 4.3 Explain useful operations for manipulating raster.	-- Explain raster graphic fundamentals -- Generate a raster image -- Describe useful operation for manipulating raster. --Describe how to write rectangle, mask, colour, copy raster, invert mask and invert rectangle and regular polygon.	--A PC loaded with a graphic *packages such as ,* Auto cards and coreldraw and connected to an OHP. --Reference manual on graphic packages .	Write program to produce raster image	To assist student in writing program to produce raster image	A PC loaded with a graphic packages in a networked laboratory
	General Objective 5: Know two-dimensional transformations					
5-6	5.1 ExplainGeometric Coordinate , composite and instance transformation	--Explain Geometric Coordinate , composite and instance transformation	--A PC loaded with a graphic *packages such as,*	Write simple program involving geometric	To assist student in writing simple program	A PC loaded with a graphic packages

			Auto cards and coreldraw and connected to an OHP. --Reference manual on graphic packages .	image .	involving geometri c image .	in a networked laboratory
	General Objective 6: **Know graphics input/output.**					
7-8	6.1 Describe graphics input devices, out put devices, mouse tablets, the light pen, etc. 6.2 Explain three-dimensional input devices: acoustics and mechanical devices. 6.3 Explain graphic out-put devices, plotters visual display units and oscilloscopes	-- Describe graphics input devices, out put devices, mouse tablets, the light pen, etc. --Explain three-dimensional input devices: acoustics and mechanical devices. --Explain graphic out-put devices, plotters visual display units and oscilloscopes	--A PC loaded with a graphic packages such as, Auto cards and coreldraw and connected to an OHP. --Reference manual on graphic packages .	Write simple program involving geometric image.	To assist student in Writing simple program involving geometri c image .	A PC loaded with a graphic packages in a networked laboratory
	General Objective 7: Know available graphics facilities					
9	7.1 Explain block graphics characters and the codes. 7.2Explain the design process of graphics characters suitable for use by a program to give an animation effect. 7.3 Explain the use of graphics commands. 7.4 Explain the graphics facilities available on computer.	--Explain block graphics characters and the codes. --Explain the design process of graphics characters suitable for use by a program to give an animation effect. --Explain the use of graphics commands. --Explain the graphics facilities available on computer.	--A PC loaded with a graphic *packages such as, Auto cards and coreldraw and connected to an OHP.* --Reference manual on graphic packages .	Write programs to display an isosceles triangle, regular hexagon and a circle	To assist student in writing programs to display an isosceles triangle, regular hexagon and a circle	A PC loaded with a graphic packages in a networke d laborator y

	General Objective 8: Know graphic packages					
10	8.1 Define graphic packages. 8.2 List available graphic packages. 8.3 Explain the available graphic packages.	--Describe the meaning of graphic package graphic.	--A PC loaded with a graphic *packages such as, Auto cards and coreldraw and connected to an OHP.* --Reference manual on graphic packages .	Write programs to display an isosceles triangle, regular hexagon and a circle .	To assist student in writing programs to display an isosceles triangle, regular hexagon and a circle	A PC loaded with a graphic packages in a networked laboratory
	General Objective 9: Know two dimensional viewing and clipping					
11-12	9.1 Explain window-to-view port mapping 9.2 Explain point clipping 9.3 Explain line clipping 9.4 Explain polygon clipping 9.5 Explain 2D graphics pipeline.	--Explain window-to-view port mapping --Explain point clipping --Explain line clipping --Explain polygon clipping --Explain 2D graphics pipeline.	--A PC loaded with a graphic *packages such as, Auto cards and coreldraw and connected to an OHP.* --Reference manual on graphic packages .	Write program to produce a 2D graphics pipeline.	To assist student in writing program to produce a 2D graphics pipeline.	A PC loaded with a graphic packages in a networked laboratory

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: OO BASIC PROGRAMMING II

CODE: VCS 316

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students acquire working skills in Basic Programming.

General Objectives: On completion of this course the students should be able to:-

1. Understand how to create classes and functions.
2. Know how to create and manipulate Data Files.
3. Understand Data Management Concepts in OO Basic
4. Know how to design report formats.
5. Understand the Dialog box concepts.

	Theoretical Content		**Practical Content**			
Week/s	**General Objectives 1.0: Understand how to create classes and objects.**					
1	1.1 Explain the constructors and destructors 1.2 Explain information guiding using private, public and protected. 1.3 Explain instances of class variables 1.4 Explain the creation of methods.	The teacher should explain constructor and destructors and explain their role in the utilization of objects. He should explain the instances access and now it is done. Examples should be given by it. The teacher should explain methods and the procedure for creating it. The teacher should explain with a sample program.	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Write programs which uses constructor and destructor, and define instances of class variables?	Assist students on their practical work.	Networked PC's loaded with OOFORTR, and a compiler
Week/s	**General Objectives 2.0: Know how to create and Manipulate Data files.**					
2-3	2.1 Describe the different types of Data files e.g. sequential, random, Binary. 2.2 Explain how to create the file types. 2.3 Explain how to read and write to the file type mentioned above.	The teacher should explain data kills, the sissies and purpose of each type. The teacher should explain demonstrate how to create data file. The teacher should also	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation	Create files and operate on them.	To assist students in their practical work .	Networked PC's loaded with OOFORTR, and a compiler

		explain and write program to demonstrate how to read and write a file. The teacher should explain and give procedural steps for creating, linking a database using codes, data control and data environment. The teacher should demonstrate and explain the importance of SQL in database access.	of lecture notes. Online lecture notes.			Networked PC's loaded with OOFORTR, and a compiler
Week/s	**General Objective 3.0: Understand database management concept in OO BASIC.**					
4-6	3.1 Describe the procedure for creating a Database 3.2 Describe the different ways of accessing a database e.g. codes, data control, and data environment. 3.3 Describe how to perform the following operations: adding, editing, updating, deleting and searching. 3.4 Explain the relevance of structure query language (SQL	The teacher should explain data kills, the The teacher should explain and give procedural steps for creating, linking a database using codes, data control and data environment. The teacher should demonstrate and explain the importance of SQL in database access.	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Create a database and implement different ways of accessing, updating, adding, searching data items using SQL.	To assist students in their practical work	Networked PC's loaded with OOFORTR, and a compiler

Week/s	**General Objective 4.0: Know how to design report format.**					
7-9	4.1 Explain how to design a report format using data report object. 4.2 Describe how to retrieve output using the format in 4.1 above. 4.3 Demonstrate 4.1 above with a sample data.	The teacher should explain and demonstrate with example how to create and use a report format.	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Write report format using Data objects. Retrieve outputs using data objects	Assist students in their practical work	Networked PC's loaded with OOFORTR, and a compiler
Week/s	**General Objective 5.0:** Understand Dialogue Box Concepts					
10-12	5.1 Explain the different Dialogue boxes available e.g. message box, input box file/open dialogue box file/save dialogue Box, File/print Dialogue Box e.t.c.	The should explain and demonstrate with example the available custom control and the use. The teacher should revise the course content. The teacher should complete revision.	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Write dialogue boxes. Write a program to demonstrate the use of 5.1 above.	Assist students in their practical work.	Networked PC's loaded with OOFORTR, and a compiler

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER PACKAGE VII (MS FRONTPAGE)

CODE: VCS 321

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to produce Proficient and Effective Web Designer, Capable of Developing and Maintaining Personal and Small Corporate Websites Using MS FrontPage.

GENERAL OBJECTIVES: After successful completion of the course, the trainee should be able to:

1. Know how to Design and Create a Website
2. Know how to Create, Format and Edit Text and Tables in MS FrontPage Web
3. Know how to Display pictures and images in Different File Formats
4. Know how to Develop and Create Forms for Information Abstraction From Site Visitors
5. Know how to Create a Consistent Look for a Web and Stabilise Web Parameters
6. Know how to Use Frames to Enhance Web Outlook
7. Know how to Publish a Web to an FrontPage Enabled Web Server

COURSE SPECIFICATION: Theoretical Contents				**Practical Contents**		
	General Objective: 1.0 Know how to Design and Create a Website					
WEEK	**Specific Learning Outcome**	**Instructors' Activities**	**Learning Resources**	**Specific Learning Objective**	**Instructors Activities**	**Learning Resources**
1-2	1.1 Explain the uses and functions of MS Fp 1.2 Describe the structure of Fp 1.3 Explain how to install and operate Fp 1.4 Explain the Concept of relative and pre-determined hyperlinks	• Explain the uses and functions of MS Fp • Describe the structure of Fp • Explain how to install and operate Fp • Explain the Concept of relative and predetermined hyperlinks	Desktop PC MS Office Software	1.1. Run the MS Fp Software 1.2. Close the MS Fp Software 1.3. Create a page on page view 1.4. Type data and text on the open page 1.5. Create a paragraph and line breaks 1.6. Insert special characters 1.7. Save a webpage 1.8. Create a hyperlink 1.9. Change the properties of a hyperlink	Supervise activity	Desktop PC MS Office Software
	1.5 Explain the various tools used in Fp 1.6 Explain the Fp views 1.7 Explain basic editing tools	• Explain the various tools used in Fp • Explain the Fp views • Explain basic editing		1.10. Create a new web 1.11. Save and close the new web 1.12. Open an existing web 1.13. Create additional pages 1.14. Print a page 1.15. 1.16. Spell check added content using the checker 1.17. Find and replace	Supervise activity	Desktop PC MS Office Software

				specific text on page 1.18. Find and replace specific text on the entire web 1.19.		
	General Objective: 2.0 Know how to Create, Format and Edit Text and Tables in MS FrontPage Web					
3	2.1 Explain the concept of formatting and text layout in MS Fp 2.2 Explain the tools for creating and formatting tables in Fp 2.3 Explain the concept of using tables as a formatting tool	Describe 2.1- 2.6	DO	Create sections and horizontal lines Changing the look of lines using images and line properties Organise data with headings Create Create a numbered and bullet list and manipulate their functions Create a Nested list within a list Create a new table using insert command and the table command Select and change table elements Select and change cell elements	Supervise activity	DO
	2.4 Explain the process of setting background 2.5 Know how to set page, table and other web properties 2.6 Know the procedures for working with numbered lists			Choose a text format using properties Change properties of selected text Set paragraphs and change its characteristics Indent a Paragragh	Supervise activity	Desktop PC MS Office Software

				Add borders and shade a section of the paragragh		
	General Objective: 3.0 Know how to Display pictures and images in Different File Formats					
4-5	3.1 Explain common picture formats, JPEG, GIF 3.2 Explain the common tools used in inserting and manipulating pictures 3.3 Explain the functions of tools on the picture Toolbar	• Explain common picture formats, JPEG, GIF • Explain the common tools used in inserting and manipulating pictures • Explain the functions of tools on the picture Toolbar	Desktop PC MS Office Software	Insert a picture using the Clip Art, from scanned picture and from a saved file Move and resize a picture Change picture properties Work with the picture toolbar Make an image transparent Save an imbedded image Use a picture as a background Make a picture as a water mark Create a thumbnail Make a thumbnail as a hotspot	Assist students to carry out the activities.	Desktop PC MS Office Software
	General Objective: 4.0 Know how to Develop and Create Forms for Information Abstraction From Site Visitors					
6-7	4.1 Explain the functions of a form in a web 4.2 Explain the functions of the tools for form creation	4.1 Explain the functions of a form in a web 4.2 Explain the functions of the tools for form creation	Desktop PC MS Office Software	Create a simple Create a form from template Create a form using wizard Add and delete fields in a form	Supervise activity	Desktop PC MS Office Software
	4.3 Explain form return values from fields	4.3 Explain form return values from fields	Desktop PC MS Office Software	Choose a form handler Configure a form handler Change from properties		Desktop PC MS Office Software

			Desktop PC MS Office Software	Change field properties in a form Retrieve data from fields in a form		Desktop PC MS Office Software
General Objective: 5.0 Know how to Create a Consistent Look for a Web and Stabilise Web Parameters						
8-9	5.1 Describe the tools for theme and general outlay of web pages in MS Fp 5.2 Explain the concept of wizards and templates in Fp	Describe the tools for theme and general outlay of web pages in MS Fp Explain the concept of wizards and templates in Fp	Desktop PC MS Office Software	Create a web using wizard Create a web using template Add a page from a template Import an existing web Create a sub-web with a different template Apply a theme to a web Enhance web outlook with style sheets Apply a theme to a page Add sound and other multimedia elements to an event on a page Maintain a web	Assist students to carry out the activities.	Desktop PC MS Office Software
	General Objective: 6.0 Know how to Use Frames to Enhance Web Outlook					
10	6.1 Explain the use of frames in web design 6.2 Explain the effects of frames in a web browser	Explain the use of frames in web design Explain the effects of frames in a web browser	Desktop PC MS Office Software	Divide a page with frames Create a frames page Edit pages in frames Modify frames properties Change frames page properties Create a frame within a frame Design and create a no-frames web Use a frame as page text out lay	Assist students to carry out the activities. Supervise activity	Desktop PC MS Office Software

	General Objective: 7.0 Know how to Publish a Web to an FrontPage Enabled Web Server					
11-12	7.1 Explain the protocols used for file transfer on the net 7.2 Explain the processes required to publish a web to a web server 7.3 Explain the concept of web security	Explain the protocols used for file transfer on the net Explain the processes required to publish a web to a web server Explain the concept of web security	Desktop PC MS Office Software	Prepare a web for publishing Recalculate hyperlinks Back up a web Publish a web to a web server with Fp server extensions Publish a web to a web server without Fp server extensions Assign permissions to web Rename a web Move a web Download and upload a web Delete a web on a server	Assist students to carry out the activities. Supervise activity	Desktop PC MS Office Software

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: OPERATING SYSTEMS

CODE: VCS 322

DURATION: HOURS/WEEK Lecture: 2 hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students master the Internal Workings of a computer system

GENERAL OBJECTIVES: On completion of this module the leaner should be able to:

1.0	Know the different types of operating systems.
2.0	Know the structure, functions, and philosophy of operating systems.
3.0	Understand interposes communication.
4.0	Know various scheduling techniques.
5.0	Understand interrupt and masking traps.
6.0	Know the different operation system commands.

General Objective 1.0: Know the different types of operating systems						
Theoretical Content				Practical Content		
WEEK	Specific Learning Outcome	Teacher's Activities	Resources	Specific Learning Outcome	Teacher's Activities	Resources
1-2	1.1 Describe operating system (0S) 2.1 Explain the importance of OS, using real life examples 2.3 Classify OS into batch, real time, time-sharing and networking. 1.4 List some examples of OS 1.5 List some OS, on Micro and mainframe Computers 1.6 Describe the concept of mono programming multiprogramming processing. 1.7 Give example of OS having feature listed above	Describe operating system (0S) Explain the importance of OS, using real life examples Classify OS into batch, real time, time-sharing and networking. List some examples of OS List some OS, on Micro and mainframe Computers Describe the concept of mono programming multiprogramming processing. Give example of OS having feature listed above	PC's with different Operating system such as WINDOW XP, WINDOW NT, UNIX versions. Manual on the operating system listed above Projectors.	Manipulate different types of operating systems	Guide students using different operating systems	PC's with varying operating systems

General Objective 2.0: Know the structure, functions, and philosophy of operating systems						
3-4	2.1 Discuss the resource management function of OS 2.2 Discuss the characteristics and features of OS. 2.4 Discuss the design philosophy of OS with the advantages	State and Explain the function of OS in relation to memory management, management and interrupt handling, information management. Explain the characteristic of OS: concurrency, sharing, non-reliable, etc features of OS: efficiency; reliabilities, and size the attributes of monolithic Explain the layers system Attributes of a layers Concept of value machines	PC's with different Operating system such as WINDOW XP, WINDOW NT, UNIX versions. Manual on the operating system listed above Projectors.	Show understanding of the design of operating systems.	To assist students to Carry out operating system design.	PC's with different Operating system such as WINDOW XP, WINDOW NT, UNIX versions. Manual on the operating system listed above Projectors.

	General Objective 3.0: Understand interposes communication					
5-6	3.1 Discuss the interprocess communication techniques.	Describe • A process • The process states • The process table • Inter process communication • Process creation and process terminations • Watt signal, deadlock	PC's with different Operating system such as WINDOW XP, WINDOW NT, UNIX versions. Manual on the operating system listed above Projectors.	Identify the processes involved in real life problems such as making a cup of tea.	To provide the students with identifiable processes involved in real life problems	PC with multimedia resources.
	General Objective 4.0: Know various scheduling techniques.					
7-8	4.1 Explain various process/processor scheduling techniques and highlight their relative advantages and the disadvantages. 4.2 Explain facilities utilization. 4.3 Distinguish between pages and segment.	Describe LIFO, FIFO, round robin priority, SJN, SRJN, etc Explain traffic density Explain facilities utilization. Distinguish between pages and segment.	PC's with different Operating system such as WINDOW XP, WINDOW NT, UNIX versions. Manual on the operating system listed above Projectors.	Develop schedules with operating system.	Demonstrate how schedules can be developed with operating system. Allow students to develop schedules.	Networked PCs.

	General Objective 5.0: Understand interrupt and masking traps.					
9-10	5.1 Explain the meaning and effect of interrupt and masking traps. 5.2 Explain levels of interrupt 5.3 State the use of masking in relation to interrupt	Define interrupt vector Describe the use of interrupt vector Describe traps Differentiate between traps and interrupt Differentiate between S/O interrupt timers, Hardware error and programming interrupt	PC's with different Operating system such as WINDOW XP, WINDOW NT, UNIX versions. Manual on the operating system listed above Projectors.	Identify interrupt and masking traps.	Demonstrate using relevant examples concept of interrupt and masking traps.	PC's with different Operating system such as WINDOW XP, WINDOW NT, UNIX versions. Manual on the operating system listed above Projectors.
	General Objective 6.0: Know the different operation system commands..					
11-12	6.1 Discuss the system commands for carrying out number of operating in the computer in the OS environment.. 6.2 Explain system commands eg. MS-DOS, etc.	State the system commands of MS-DOS, WINDOWS, UMX WINDOW NT, PC-DOS UNIX Versions,(e.g. LINUS).	PC's with different Operating system such as WINDOW XP, WINDOW NT, UNIX versions. Manual on the operating system listed above Projectors.	Apply the commands in appropriate OS.	Assist students to apply the commands in a chosen OS environment.	PC's with different Operating system such

PROGRAMME:	NVC IN COMPUTER SCIENCE
MODULE:	MANAGEMENT INFORMATION SYSTEM
CODE:	VCS 323
DURATION:	HOURS/WEEK: Lecture :2hrs Tutorial: 0 Practical: 2hrs
UNITS:	2 Units

GOAL: This module is designed to introduce students to management information systems.

GENERAL OBJECTIVES: On completion of this module the students should be able to:

1. Know different systems.
2. Understand systems theory.
3. Understand the concept of management information.
4. Know the features of management information systems (MIS)
5. Understand the concept of transaction processing.
6. Understand the concept of office automation.
7. Understand the different applications of MIS.
8. Understand the principles of decision making
9. Know the development cycle of an MIS
10. Understand the principles of project management.
11. Understand total systems.

	Theoretical Content			**Practical Content**		
	General Objective 1: Know different systems.					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1Explain a system and its characteristics. 1.2 Describe the taxonomy of systems; deterministic, probabilities, static, dynamic etc. 1.3 Explain organization and business education as make up of systems or subsystems	Define a system State the characteristics of a system. Explain the taxonomy of a system: deterministic, probabilistic, static, dynamic etc. Explain organizations, business, education, etc as made up of systems or subsystems	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.
	General Objective 2 : Understand systems theory.					
2	2.1 Explain how to close and open loop systems. 2.2 Explain feedback control n a system 2.3 Explain a system model 2.4 Explain how to represent a system	Distinguish between closed and open loop systems. Explain feed back control in system. Define a system model List types of models Represent systems as models.	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.

	General Objective 3 : Understand the concept of management information.					
3	3.1 Explain management and it's functions	Define management List the functions of management	A flip chart. OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.
	3.2 Explain information needs of management levels. 3.3 Explain attributes of information	Explain the information needs of management levels. Explain and give attributes of information	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.

	General Objective 4 : Know the features of management information systems (MIS)					
4	4.1 Explain an information system and it's characteristics. 4.2 Explain management information system. 4.3 Appreciate the importance of MIS to business organizations. 4.4 Recognise features of information systems	Define information system. Explain the characteristics of an information system. Define management information system. Explain the importance of MIS to business organization. Explain the features of an information system.	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages
Week/s	**General Objective 5:** Understand the concept of transaction processing.					
5	5.1 Explain the concept of data and information 5.2 Explain data capture 5.3 Explain verification and validation 5.4 Explain data processing stages 5.5 Explain the concept of a database management system (DBMS), including insertion , delete and update operations.	Explain concept of data and information. Explain data processing stages. Explain the concepts of data capture, verification and validation. Explain concepts of a database management system (DBMS) Explain insertion, deletion and update operations	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.

Week/s	**General Objective 6:** Understand the concept of office automation.					
6	6.1 Explain office automation and it's components, e-mail, voice mail, fax machine, teleconferencing 6.2 Explain telecommuting 6.3 Explain the importance of office automation (OA) to an organization	Define office automation. Explain components of office aAutomation i.e. e-mail, voice-mail fax machine, teleconferencing, Explain telecommuting. Explain the importance of office automation (O.A.) to an organization.	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developin g a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages
Week/s	**General Objective 7:** Understand the different applications of MIS.					
7	7.1 Explain various types of information systems and their objectives.	List the various types of information system. Explain the objectives of	*A flip*	Develop a simple MIS	To assist student in developin	OHP connected to PC.

	7.2 Recognise the elements required for any information system 7.3 Explain reports required for any types of information system	each type of information system Explain the elements required for any information system. Explain the nature of reports required for each type of information system.	*chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.		g a simple MIS	Networked PC laboratory, with internet access loaded with MIS packages.
	7.4 Explain sources of data for each type of information system 7.5 Explain the information needs, strategic technical and operational advantages of MIS	Identify sources of data for each type of information system. Identify information needs: strategic, technical, and operational. Identify some advantages of MIS	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	To be able to develop a simple MIS	To assist student in developin g a simple MIS	OHP connected to PC. Networke d PC laboratory, with internet access loaded with MIS packages.

Week/s	**General Objective 8:** Understand the principles of decision making					
8	8.1 Explain the stages in decision making 8.2 Explain various approaches to decision making 8.3 Explain application of some decision making techniques	Explain decision making. Teacher to represent this diagrammatically. Teacher to explain the approaches to decision making. Teacher to give students a case study on decision making techniques	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages
Week/s	**General Objective 9:** Know the development cycle of an MIS					
9	9.1 Explain the need for information system development	Explain the need for information system development	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.

	9.2 Explain the phases and importance in the development cycle of MIS	Identify the phases in the development cycle of MIS State the importance of each phase Describe each of the phases of the development cycle of an MIS.	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.
Week/s	**General Objective 10:** Understand the principles of project management.					
10	10.1 Explain project management and its objectives. 10.2 Explain some tools used in project management and their application	Define project management Explain the objectives of project management. Identify tools to be used in project management. Apply the tools	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.
Week/s	**General Objective 11:** Understand total systems.					
11-12	11.1 Explain the objectives of a total	State the objectives of a total system	*A flip*	To be able to	To assist	OHP connected to PC.

	system. 11.2 Explain rationalization of information flows, timing and accuracy of destination of output.	Explain rationalizing information flows, timing and accuracy of destination of output.	*chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	develop a simple MIS	student in developing a simple MIS	Networked PC laboratory, with internet access loaded with MIS packages.
	11.3 Explain the effect of time lag on inputs 11.4 Explain the effect of deviating from standards.	Explain the effect of time lag on inputs. Explain the effect of deviating from standards. Develop an MIS.	*A flip chart.* OHP connected to PC. Power point presentation of Lecture notes. On line lecture notes. White board.	Develop a simple MIS	To assist student in developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: WEB DESIGN AND DEVELOPMENT III (JAVA SCRIPT)

CODE: VCS 324

DURATION: HOURS/WEEK Lecture :2hrs Tutorial:0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students acquire working skills in JavaScript

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1. Understand the Processes to get Started with JavaScript
2. Understand the Arithmetic and Logical Operations
3. Understand The Processes of Looping in JavaScript
4. Understand the String and Array methods
5. Understand Objects, methods and properties in JavaScript
6. Know the Hierarchy of Browser Objects
7. Understand how to use the form objects
8. Know how to work with image maps
9. Know the hidden Files and Cookies
10. Understand Style Sheets in JavaScript

	Theoretical Content			**Practical Content**		
	General Objective 1: Understand how to start working with JavaScript					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 Explain how to get started 1.2 Explain the types of variables 1.3 Explain array variables 1.4 Explain how to convert data types	Explain how to get started with JavaScript. Explain the types of variables in JavaScript. Explain the meaning of Array. Explain the usefulness of arrays in Java. Explain the conversion of one data type to another	Any complete system Java Software Java Compiler	Demonstrate how to get started with Java script	Supervise activity	Any complete system Java Software
	General Objective 2: Understand the Arithmetic and Logical Operations					
2	2.1 Explain the arithmetic operators 2.2 Explain the logical and comparison operators 2.3 Explain the assignment operators 2.4 Explain the Ternary operator 2.5 Explain Operator Precedence 2.6 Explain Assignment Statements 2.7 Explain an IF statement 2.8 Explain Switch Statements 2.9 Explain Function Call Statement 2.10 Explain Try, Catch, and Throw Statements	Explain the arithmetic operators (symbols) Explain the logical and comparison operators (symbols). Illustrate the symbol(s) which assigns Values to a character or stings data. Explain Ternary operators Explain the order of	Any complete system Java Software Java Compiler	Illustrate the symbol(s) which assigns Values to a character or stings data. Demonstrate activities 2.1 – 2.10	Supervise activity	Any complete system Java Software Java Compiler

		operations for an operation involving more than one operator. Explain an Assignment Statement. Explain an IF statement Differentiate an assignment Statement from an IF statement. Explain the Switch Statement. Explain Function Call Statement Explain when it is required. Explain each of Try statement, Catch statement, Throw statement.	Any complete system Java Software Java Compiler			Any complete system Java Software Java Compiler
	General Objective 3: Understand The Processes of Looping in JavaScript					
3	3.1 Explain the concept of looping in JavaScript 3.2 Explain the "FOR" loop 3.3 Explain the "WHILE" loop 3.4 Explain the "DO WHILE" loop 3.5 Explain the Break and Continue statements	Explain the meaning of loop Illustrate the "FOR loop" with an example. Illustrate the "WHILE loop" Explain the "DO WHILE" loop. Explain Break statements Explain Continue statements. Explain the different features of the loops	Any complete system Java Software Java Compiler	Execute Looping in a simple programme.	Supervise activity	Any complete system Java Software Java Compiler

	General Objective 4: Understand the String and Array methods					
4	4.1 Explain String method 4.2 Explain Array method	Explain Java statements using Sting methods Explain the array method	Any complete system Java Software Java Compiler	Create an array method	Supervise activity	Any complete system Java Software Java Compiler
	General Objective 5: Understand Objects, methods and properties in JavaScript					
5	5.1 Explain the basic objects in Java 5.2 Explain Boolean Objects 5.3 Explain Data objects. 5.4 Explain Global objects 5.5 Explain Math object 5.6 Explain Number object 5.7 Explain Color constants	Explain basic objects in JavaScript Explain the Boolean Objects in JavaScript. Explain Data Objects Explain objects that are global Explain Math Objects. Illustrate Number object. Illustrate the color constants in Java.	Any complete system Java Software Java Compiler	Illustrate Number object. Illustrate the color constants in Java.	Supervise activity	Any complete system Java Software Java Compiler

	General Objective 6: Know the Hierarchy of Browser Object					
6	6.1 Explain the following objects: Window Object, Document object, History object, Navigator object. 6.2 Explain their Hierarchy	Explain each of the following objects: Window objects, Document objects, History object, and Navigator object Illustrate the Hierarchy of the objects	Any complete system Java Software Java Compiler	Illustrate the Hierarchy of the objects	Supervise activity	Any complete system Java Software Java Compiler
	General Objective 7: Understand how to use the form objects					
7	7.1 Explain how to use the objects 7.2 Explain the Buttons, Checkbox, Radio buttons, and text fields	Explain how to use the form object Explain the buttons, Checkbox, Radio buttons and text fields.	Any complete system Java Software Java Compiler	Show how to use the form object	Supervise activity	Any complete system Java Software Java Compiler
	General Objective 8: Know how to work with image maps					
8	8.1 Explain how to work with image maps. 8.2 Explain how to create simple animation	Illustrate how to work with image maps. Illustrate how to create animation	Any complete system Java Software Java Compiler	Illustrate how to work with image maps. Illustrate how to create animation	Supervise activity	Any complete system Java Software Java Compiler

	General Objective 9: Know the hidden Files and Cookies					
9-10	9.1 Explain how to use Cookies	Explain the meaning of Cookies. Explain how to use cookies	Any complete system Java Software Java Compiler	Illustrate the use of Cookies	Supervise activity	Any complete system Java Software Java Compiler
	General Objective 10: Understand Style Sheets in JavaScript					
11-12	10.1 Explain Style Sheets 10.2 Explain how to import an External Style Sheet. 10.3 Explain the tag <SPAN> 10.4 Explain how to position HTML contents 10.5 Explain the <LAYER> tag	Explain Style Sheets Illustrate how to import an External Style Sheet. Explain the use of the tag <SPAN>. Illustrate how to position Hypertext Markup Language content. Explain the <LAYER> tag.	Any complete system Java Software Java Compiler	Illustrate how to import an External Style Sheet. Illustrate how to position Hypertext Markup Language content.	Supervise activity	Any complete system Java Software Java Compiler

PROGRAMME: NVC IN COMPUTER SCIENCE

MODULE: COMPUTER SYSTEMS MANAGEMENT

CODE: VCS 325

DURATION: HOURS/WEEK Lecture :2hrs Tutorial: 0 Practical: 2hrs

UNITS: 3 Units

GOAL: This module is designed to enable students to enable students acquire knowledge in computer systems management.

GENERAL OBJECTIVES: On completion of this module the students should be able to:-

1. Understand the planning of a new installation
2. Know the preparation and evaluation of proposals
3. Understand personnel management of computer system
4. Know data processing standards
5. Know performance evaluation of computer staff
6. Know computer equipment
7. Know site preparation for computer installation
8. Know system auditing.

	Theoretical Content			**Practical Content**		
	General Objective 1: Understand the planning of a new installation					
Week	**Specific Learning Outcomes**	Teacher's activities	Resources	Specific Learning Outcomes	Teacher's activities	Resources
1	1.1 List general computer room requirements 1.2 Describe accessibility to the computer room and other rooms associated to it. 1.3 Identify all ancillary equipment and their space allocation 1.4 Explain the importance of air-conditioning and communication facilities in the computer room 1.5 Explain the importance of auxiliary power supply, fire prevention equipment, and dehumidifying equipment in a computer room.	• Outline the necessary requirements for a computer room • Explain the need for good accessibility to computer room • List the ancillary equipment and the space allocation for such equipment • Discuss the importance of air-conditioning and effective communication facilities for a computer room • Explain the importance of stand-by power supply, fire prevention equipment, and dehumidifying equipment in a computer room.	• Layout sketch of a computer room • Items of fire fighting equipment • Safety posters	Design a plan of a new installation	Supervise activity	Computer system Various Operating systems and application packages
	General Objective 2: Know the preparation and evaluation of proposals					
2	2.1 Define a feasibility study 2.2 Explain factors affecting management decisions to	• Explain feasibility study	Previous projects of feasibility study	Evaluate sample proposals	- do -	Computer system

	install a computer system 2.3 Describe proposal specifications 2.4 Compare different proposals using weighted ranking, evaluation of scores and cost analysis	• State the factors that could affect management decisions to install a computer system • Explain proposed specification and compare different proposals using various criteria				Various Operating systems and application packages
	General Objective 3: Understand Personnel Management of Computer system					
3-4	3.1 Describe the organizational structure of a typical data processing department using an organogram 3.2 Explain th functions of the following within the D.P. organization: (a) Data Processing Manager (b) Data Administrator (c) Systems Analyst/Designer (d) Systems Engineer (e) Maintenance Programmer (f) System Programmer (g) Application Programmer (h) Operations Manager (i) Data Operator (j) Data Entry Staff (k) Data Library Staff. 3.3 Describe line and staff relationship with a D.P. Department 3.4 Explain general safety and security procedures in computer room	• Show and explain an organogram of a typical data processing department • Describe thed functions of the various D.P. functionaries listed in general objective 3.2 • Outline line and staff relationship within a D.P. department • Explain the need for safety and security in a computer	A typical organogram Computer system Various Operating systems and application packages	Draw an organogram of a typical data processing department	- do -	Computer system Various Operating systems and application packages

	General Objective 4: Know Data Processing Standards					
5	4.1 Explain Data Processing Standards 4.2 List various types of D.P. standards 4.3 Explain in-house standards and their uses	• Describe data processing standards • List various types of D.P. standards and their uses	Computer system Various Operating systems and application packages			Computer system Various Operating systems and application packages
	General Objective 5: Know Performance evaluation of Computer Staff					
6-7	5.1 Describe performance analysis 5.2 Describe programming efficiency 5.3 Describe production levels of a computer	• Explain: (i) Performance analysis (ii) Programme efficiency (iii) Production level of a computer	Computer system Various Operating systems and application packages			Computer system Various Operating systems and application packages
	General Objective 6: Know Computer Equipment situation					
8-9	6.1 List all equipment available in D.P. environment **6.2** Explain the functions of the equipment in 6.1 above in respect of special applications **6.3** Describe methods of security of computer equipment **6.4** Describe types of computer maintenance arrangement and compare their cost	• Outline the necessary equipment available in D.P. environment • Explain the functions of the equipment • Describe methods of security of computer equipment • Explain types of computer maintenance arrangement and compare their cost	Computer system Various Operating systems and application packages			Computer system Various Operating systems and application packages

	General Objective 7: Know Site Preparations for Computer Installation					
10	7.1 Explain site preparation 7.2 Design: (a) False flooring (b) False roofing 7.3 Explain pre-installation arrangement and internal partitioning	• Explain the process of site preparation • Design: False flooring and False roofing • Describe the process of internal partitioning	Computer system Various Operating systems and application packages	Show site preparation Design: (a) False flooring (b) False roofing, pre-installation arrangement and internal partitioning	Supervise activity	Computer system Various Operating systems and application packages
	General Objective 8: Know Systems Auditing					
11-12	8.1 Name and describe types of systems auditing 8.2 List and explain systems auditing elements 8.3 State the advantages of internal checks 8.4 Describe methods of reporting internal checks 8.5 Describe methods of presenting system auditing report	• Enumerate and describe types of systems auditing • Outline and explain systems auditing elements • State the advantages of internal checks and how to report internal checks • Describe methods of presenting systems auditing reports	Computer system Various Operating systems and application packages	Carryout auditing of a sample report.	Guide students to Carryout auditing of a sample report.	Computer system Various Operating systems and application packages

SOFTWARE REQUIREMENT

S/No.	Item	Specification	Quantity
1.	Operating Systems (OS)	Windows (XP, Vista, NT Server)	All Systems
2.	Operating Systems (OS)	Linux	All Systems
3.	Application Packages	MS Office suite - Corel Draw (latest version) - Auto CAD - Mavis Beacon - Adobe Photoshop - Macro Media suite (Dream Wearer, Flash, Fireworks, etc.) - Project Manager.	All Systems
4.	Software Development tools	VB Net PHP	All systems
5.	Database Management System	ORACLE 105 My SQL server	All systems
6.	Web Server	Apache web server	All systems
7.	Antivirus	AVG, Norton, MacAfee, (Latest Version) (Original Version), Any	To be installed in each system

ELECTRICAL/ELECTRONICS

S/No.	Item	Specification	Quantity
1.	Electrical parts from Main supply		20 – 40
2.	Network Cabling Requirements	Hubs, RJ45, Switches, Plugs	- do -
3.	Routers		1
4.	Stabilizers	1000VA	20
5.	Extensions with Surge protector		10 – 15
6.	Stand-by Generating Set	15 – 30KVA	1
7.	Air conditioning unit	2hp	4 - 6
8.	Multimedia Projectors	1500/2000 Lumens	5
9.	Projector Stand		1
10.	Infra Red touch		1
11.	Joystick		1
12.	Web Cam & Head phone		1, 1

HARDWARE REQUIREMENT.

S/No.	Item	Specification	Quantity
1.	Computer System	- 512 MB RAM 1 GB - 80 Gigs H/D - P IV Main board (min of 2.4 GHz) - DVD Writer and other Drives - Monitor (preferably LCD) (17") - Speakers - P.M. LapTop	20 – 40
2.	Printers	LaserJet, Desk Jet (Hp 1320/P2015), HP 1020/1018, HPDJ 6480, HP 6540, etc.	1 – 3
3.	Scanners	(Flat bed)	1 – 3
4.	Computer Maintenance tool box	Tools Box (long Screw drivers, star pin, cables.)	1
5.	Digital Camera	Sony, Hp, MP4i	1
6.	Internet Connectivity	(Wireless, VSAT (KU/C-Band) (1.2m,/.8m, 2.4m), (2w/5w) or as appropriate	
7.	Switch (for Networking)	24 ports.	2 Nos.
8.	UPS	600/650VA/600/650VA + AVR	20 – 40
9.	Modem		1

OTHER ADMINISTRATIVE/TECHNICAL REQUIREMENTS

S/No.	Item	Quantity
1.	Fire extinguishers	3 large ones or 5 medium ones
2.	Dust Covers	40
4.	Computer tables and chairs	40
5.	CD ROM/DVD ROM/Flash Discs/Floppy/Zip (100/250 mbytes)	Lots
6.	External USB Hard drives (20 or 30 Gig HDD)	1no.
7.	Screen Shield (15"/17")	1no.
8.	Network Printers (HP4 100/5100/5110 Network Printer)	1no.
9.	Photocopies (Sharp/Canon/Zerox	1no.
10.	Binding Machines	1no.
11.	Laminating Machines	1no.
12.	Cutting Machines	1no.
13.	Binding Accessories	1no.
14.	Toners/Ink Cartridges for LaserJet and DeskJet Printers	
15.	Toners and Developers for photocopying machines	
16.	A4 Reams of Papers	2 Cartons
17.	Spiral Binders	Lots
18.	A4 Card	One (1) Carton
19.	Scraps (Motherboards, Processors, Fans, Power pack, RAMS, Cables, RJ45 Cables, Hard disc/Floppy drives, DVD/CD drives, Zip drives, IDE Cables, Screws/screw drivers, Meters, Testers, USB Chords, USB hubs, Routers, Switches, Mask, Modems, Race ways, Cards {TV/FM) video, Ethernet, USB, Sound, VGA, Toner, Keyboards, Mouse, Casing, Monitors, Soldering Iron and Lead, Lab manuals/Handouts, Drillers, cripping tools.	

20.	Masking tapes	5no.
21.	System Blowers	1no.
22.	Refrigerator	5no
23.	Stapling machines	1no.
24.	Scale Rules	1no.
25.	Television	1no.
26.	Video machine	1no.
27.	VHS and/OR VCD/DVD Player	1no.

TEAM LIST

S/No.	Name	Address
1.	Onah Hilary	Dept. of Maths & Computer Science, Kaduna Polytechnic, Kaduna.
2.	Ganiyu Shefiu O.	Legacy Computer Institute, Kaduna.
3.	Adeyemo Omowunmi O.	University of Ibadan, Computer Science Department, Ibadan.
4.	Engr. Promise Ogbu	Khemsafe Computers & Communication Ltd., Kaduna.
5.	Davies, Lawrence B.	Dept. of Maths/Stat/Computer Science, Kaduna Polytechnic, Kaduna.
6.	Engr. Dr. Nuru A Yakubu,OON	Executive Secretary, NBTE Kaduna
7.	Dr. M S Abubakar	Director (Programmes) NBTE, Kaduna
8.	O. E. Okafo	HOD Agric. & Science, N.B.T.E., Kaduna
9.	Mal. Lawan Abdulkarim	Ag. HOD Technical Collges Division, NBTE, Kaduna
10.	Engr. A D K Muhammad	D O VEI/IEI, NBTE Kaduna
11.	Dr. Rufai Ibrahim	N.B.T.E., Kaduna.
12.	Ogbonna Fidelis	N.B.T.E., Kaduna
13.	Zaynab A. B. Musa	N.B.T.E., Kaduna