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la science et la culture

Computer Science

National Diploma (ND)

Curriculum and Course Specifications

NATIONAL BOARD FOR TECHNICAL EDUCATION
Federal Republic of Nigeria

UNESCO – Nigeria Project

2004

Computer Science - National Diploma (ND)

Curriculum and Course Specifications

November 2004

NATIONAL BOARD FOR TECHNICAL EDUCATION

Produced by the National Board for Technical Education (NBTE)
Plot B, Bida Road, P.M.B. 2239, Kaduna Nigeria.

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GENERAL INFORMATION

1.0 Programme Goal

The National Diploma programme is designed to produce computer personnel capable of applying the use of computer in most areas of data analysis.

1.1 Objective of the programme

Diplomats of this programme should be able to:-

- Solve simple hardware problems
- Use various programming languages:

  • Visual Basic
  • OO Fortan
  • OO Cobol, and
  • Java

- Know the Operation of Computer systems
- Use Computer packages
- Maintain hardware

1.2 Higher National Diploma

Programme Goal

This syllabus is designed to produce technically competent graduates to meet National middle-level manpower needs in Computer Science.

1.3 Objective of the programme

A product of this programme should be able to:

- Install and manage a Computer system.
- Design and run efficient programmes in a wide spectrum of fields, and in various languages.
- Advise on the installation and management of Computer facilities.
- Detect technical faults in a Computer installation.
- Carry out routine (preventive) maintenance of Computer facilities.

2.0 Entry Requirements

2.1 National Diploma

The entry requirements into National Diploma Computer Science programme are as follows:-

a) Four credit level passes in GCE "O" level or Senior Secondary School Certificate (SSCE) at not more than two sittings

The four subjects must include mathematics, Physics, English language and any other subject.

b) Four credit passes in an NBTE recognized preliminary National Diploma course offered in a Polytechnic or similar post secondary technical institution. The credit passes must include mathematics, physics, English language and any other subject

c) A pass in Computer Foundation Examination (CFE) of Computer Professionals Registration Council of Nigeria (CPN). The student must be prima fascia qualified as in (1) above.

2.2 Higher National Diploma

The minimum entry requirement into the Higher National Diploma in Computer Science is as follows:-

a) The National Diploma in Computer Science obtained from an accredited programme, with at least the lower credit pass or

b) The Nigerian certificate in Education with major in Computer Education, at not more than the merit level pass.

c) CPE I of CPN with at least the lower Credit.

In addition to (a), (b) and (c) above the candidate must have acquired not less than one year post ND/NCE/PCE I cognate work experience.

In exceptional cases, ND diplomats with a pass (CGPA of 2.0-2.49) in the ND examination with two or more years of cognate experience in the specific field may be considered for admission into the HND programme.

3.0 Curriculum

3.1 The curriculum of all ND and HND programmes consists of four main components. These are:-

I. General studies/education
II. Foundation courses
III. Professional courses
IV. Supervised Industrial work experience scheme (SIWES).

3.2 The General Education component shall include course in

English Language
Communication
Mathematics
Citizenship (the Nigerian Constitution), Sociology
Entrepreneurship

3.3 The General Education component shall account for not more than 15% of total contact hours for the programme.

3.4 **Foundation Courses** include courses in Mathematics, and Statistics etc. The number of hours will vary with the programmes and may account for about 10 -15% of the total contact hours.

3.5 **Professional Courses** are courses, which give the student the theory and practical skills he needs to practice his field of calling at the technical/technologists level.

3.6 **Student Industrial Work Experience Scheme (SIWES)** shall be taken during the long vacation following the end of the second semester of the first year. See details of SIWES at paragraph 8.0.

4.0 Curriculum structure

4.1 ND programmes

The structure of the programme courses of four semesters of classroom, laboratory and workshop activities in the college - and a period (3-4 months) of supervised industrial work experience scheme (SIWES). Each semester shall have 17 weeks duration made up as follows:-

15 contact weeks of teaching, i.e. recitation, practical exercises, quizzes, test, etc; and

2 weeks for examinations and registration. SIWES shall take place at the end of the second semester of the first year.

4.2 HND programme

The structure of the programme is similar to that of the ND save that the SIWES at the end of the first year is not compulsory.

5.0 Accreditation

Each programme offered either at the ND or HND level shall be accredited by the NBTE before the diplomats can be awarded either of the two diploma certificates. Details about the process of accredit ting a programme for the award of the ND or HND are available from the Executive Secretary, National Board for Technical Education, P. M. B. 2239, Kaduna, Nigeria.

6.0 Conditions for the award of the ND/HND

Institutions offering accredited programmes will award the National Diploma to candidates who successfully completed the programme after passing prescribed coursework, examinations, diploma project and the supervised industrial work experience. Such candidates should have completed a minimum of between 72 and 80 semester credit units depending on the programme.

Diplomas shall be classified as follows:-

Distinction - GPA of 3.50 and above
Upper Credit - GPA of 3.00 - 3.49
Lower Credit - GPA of 2.50 - 2.99
Pass - GPA of 2.00 - 2.49

7.0 Guidance notes for Teachers Teaching the programme

7.1 The new curriculum is drawn in unit courses. This is in keeping with the provisions of the National Policy on Education which stress the need to introduce the semester credit units which will enable a student who so wish to transfer the units already completed in an institution of similar standard from which he is transferring.

7.2 In designing the units, the principle of the modular system by product has been adopted; thus making each of the professional modules, when completed provides the student with technician operative skills, which can be used for employment purposes.

7.3 As the success of the credit unit system depends on the articulation of programmes between the institutions and industry, the curriculum content has been written in behavioural objectives, so that it is clear to all the expected performance of the student who successfully completed some of the courses or the diplomats of the programme. There is a slight departure in the presentation of the performance based curriculum which requires the conditions under which the performance are expected to be carried out and the

criteria for the acceptable levels of performance. It is a deliberate attempt to further involve the staff of the department teaching the programme to write their own curriculum stating the conditions existing in their institution under which the performance can take place and to follow that with the criteria for determining an acceptable level of performance. The Academic Board of the institution may vet departmental submission on the final curriculum. Our aim is to continue to see to it that a solid internal evaluation system exists in each institution for ensuring minimum standard and quality of education in the programmes offered throughout the polytechnic system.

7.4 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 practice in the ratio of about 40:60.

8.0 Guidelines on SIWES programme

8.1 For the smooth operation of the SIWES, the following guidelines shall apply:

Responsibility for placement of Students

a. Institutions offering the ND programme shall arrange to place the students in industry. By April 30 of each year, six copies of the master list showing where each student has been placed shall be submitted to the Executive Secretary, NBTE which shall, in turn, authenticate the list and forward it to the industrial Training Fund, Jos

b. The Placement officers should discuss and agree with industries on the following:

I. A task inventory of what the students should be expected to experience during the period of attachment. It may be wise to adopt the one already approved for each field.

II. The industry-based supervisor of the students during the period, likewise the institution based supervisor.

III. The evaluation of the student during the period. It should be noted that the final grading of the student during the period of attachment should be weighted more on the evaluation by his industry-based supervisor.

8.2 Evaluation of Students during the SIWES

In the evaluation of the student, cognizance should be taken of the following items:

a) Punctuality
b) Attendance
c) General attitude to work
d) Respect for authority
e) Interest in the field/technical area
f) Technical competence as a potential technician in his field.

8.3 Grading of SIWES

To ensure uniformity of grading scales, the institution should ensure that the uniform grading of students' work which has been agreed to by all polytechnics is adopted.

8.4 The Institution based Supervisor

The institution-based supervisor should initial the log book during each visit. This will enable him to check and determine to what extent the objectives of the scheme are being met and to assist students having any problems regarding the specific given to them by their industry-based supervisor.

8.5 Frequency of visit

Institution should ensure that students placed on attachment are visited within one month of their placement. Other visits shall be arranged so that:

I. There is another visit six weeks after the first visit; and
II. A final visit in the last month of the attachment.

8.6 Stipend for Students in SIWES

The rate of stipend payable shall be determined from time to time by the Federal Government after due consultation with the Federal Ministry of Education, the Industrial Training Fund and the NBTE.

8.7 SIWES As a component of the Curriculum

The completion of SIWES is important in the final determination of whether the student is successful in the programme or not. Failure in the SIWES is an indication that the student has not shown sufficient interest in the field or has no potential to become a skilled technician in his field. The SIWES should be graded on a fail or pass basis. Where a student has satisfied all other requirements but failed SIWES, he may only be allowed to repeat another four months SIWES at his own expense.

National Board for Technical Education,
Kaduna,
2004

CURRICULUM TABLE

COMPUTER SCIENCE NATIONAL DIPLOMA

YEAR I SEMESTER 1

Course Code	Course Title	L	P	CHW	CH	Prerequisite
COM 101	Introduction to computing	2	2	4	60	None
COM 112	Introduction to Digital Electronics	2	2	4	60	None
COM 113	Introduction to Programming	2	2	4	60	None
STA 111	Descriptive Statistics I	1	2	3	45	None
STA 112	Elementary Probability Theory	2	1	3	45	None
MTH 111	Logic and Linear Algebra	1	1	2	30	None
MTH 112	Functions and Geometry	2	1	3	45	None
OTM 112	Technical English I	2	2	4	30	None
GNS 127	Citizenship Education I	2	0	2	30	None
		16	13	29	405	

YEAR I SEMESTER 2

Course Code	Course Title	L	P	CHW	CH	Prerequisite
COM 121	Scientific Programming Language using OO Java.	2	4	6	90	COM 101,113
COM 122	Introduction to the internet	2	2	4	60	COM 101
COM 123	Computer application packages I	2	4	6	90	COM 101
COM 124	Data structure and Algorithms	3	1	4	60	COM 113
COM 125	Introduction to Systems Analysis	2	1	3	45	None
COM 126	PC Upgrade & Maintenance	1	5	6	75	None
GNS 128	Citizenship Education II	2	0	2	30	GNS 127
		14	17	31	465	

YEAR II SEMESTER 1

Course Code	Course Title	L	P	CHW	CH	Prerequisite
COM 211	Computer Programming using OO Basic	2	3	5	75	COM 113
COM 212	Introduction to systems Programming	2	3	5	75	COM 101
COM 213	Commercial Programming Language using OOCOBOL	2	3	5	90	COM 113
COM 214	File Organization and Management	2	1	3	45	COM 101
COM 215	Computer Packages II	2	4	6	90	COM 123
COM 216	Computer Systems Troubleshooting I	1	4	5	75	None
OTM 217	Technical English II	2	1	3	45	OTM 101
		13	19	32	480	

YEAR II SEMESTER 2

Course Code	Course Title	L	P	CHW	CH	Prerequisite
COM 221	Computer Programming using OO FORTRAN	2	4	6	90	COM 113, COM 101
COM 222	Seminar on Computer and Society	2	-	2	30	None
COM 223	Basic Hardware Maintenance	2	3	5	75	COM 112
COM 224	Management Information system	2	2	4	45	COM 101, 103
COM 225	Web Technology	2	4	6	90	COM 122
COM 226	Computer Systems Troubleshooting II	1	4	5	75	COM 216
COM 229	Project		4	4	60	COM 123
STA 226	Small Business Start Up	2	1	2	30	None
		13	22	35	480	

YEAR I SEMESTER I

Course: Introduction to Computers

Programme: Statistics (National Diploma)			
Course: Introduction to Computers	**Course Code: COM 101**	**Total Hours:**	**60**
Year: 1 Semester: 1	**Pre-requisite:**	**Theoretical:** **Practical:**	**2 hours /week** **2 hours /week**

Goal: This course is designed to enable students to acquire a basic knowledge of computers

General Objectives: On completion of this course the diplomat, should be able to:

1. Understand the history, classification and impact of computers.
2. Know the concept of computer hardware
3. Know the concept of computer software.
4. Understand computer data processing systems.

5 Know the procedures for computer and data preparation method.

6. Understand security and safety procedures within a computer environment.
7. Understand the concept of a computer network
8. Understand the use of the internet.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1 (COM 101): Understand the history, classification and impact of computers.					
1	1.1 Define the computer 1.2 Describe the development of computers, in particular abacas, Pascal, Babbage, Hollerith and ENIAC. 1.3 Classify computers according to generations from 1st - 5th generation (any subsequent generation)	Define computer Trace the history of computer. Classify the computer according to generations	White Board. PC loaded with Power point and connected to OHP	Be able to classify computer systems.	Guide students to classify computer systems	Networked PCs loaded with software packages.
2	1.4 Distinguish between analogue, digital, and hybrid computers 1.5 Explains the social implication of computers on society in particular privacies and quality of life. 1.6 List the benefits of computers to the society.	Distinguish between types and classes of computers. Highlight the implications of computers to the society. Outline the benefit of computer to the society.	White Board. PC loaded with Power point and connected to OHP	Be able to classify computer systems.	Guide students to classify computer systems	Networked PCs loaded with software packages.
	General Objective 2 (COM 101): Know the concept of computer hardware					
3	2.1 Describe computer hardware configuration. 2.2 List some input and output units 2.3 Describe the function of the out unit.	Discuss the meaning of hardware. Discuss the various components and functions of various hardware units. Discuss computer software programming languages and differentiate between the levels.	White Board. PC loaded with Power point and connected to OHP	Be able to Identify the various components of a computer system	Guide the students on how to identify the various components of a computer system	A DEMO PC showing its components

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
4	2.4 Describe the function of C.P.U. 2.5 List some auxiliary Units. 2.6 Describe the function of the auxiliary memory 2.7 Define bits, byte, nibble, and word and storage size.	Discuss the various components and functions of various hardware units. Discuss computer software programming languages and differentiate between the levels.	White Board. PC loaded with Power point and connected to OHP	Be able to Identify the various components of a computer system	Guide the students on how to identify the various components of a computer system	A DEMO PC showing its components
	General Objective 3 (COM 101): Know the concept of computer software.					
5	3.1 Explain software and its various types 3.2 Distinguish between the low - level and high - level languages. 3.3 Explain source and object programmes.	Discuss software and its various types. Explain computer packages and its various types.	White Board. PC loaded with Power point and connected to OHP	Be able to load computer packages on computer system	Demonstrate how to load various computer packages on computer systems	Networked PCs loaded with different computer packages
6	3.4 Define a translator. 3.5 Explain types of translators: assembler, compiler, and interpreter. 3.6 Explain the use of package programs.	Discuss software and its various types. Explain computer packages and its various types.	White Board. PC loaded with Power point and connected to OHP	Be able to load computer packages on computer system	Demonstrate how to load various computer packages on computer systems	Networked PCs loaded with different computer packages
	General Objective 4 (COM 101): Understand computer data processing systems.					
7	4.1 Explain different processing modes.	Explain offline and online concepts Define batch processing, real time, time sharing and distributed processing Differentiate between batch processing, real time processing, time-sharing and distributed processing system.	White Board. PC loaded with Power point and connected to OHP	Be able to recognize life problems requiring the application of the various modes	Guide the students on how to identify real life problems requiring the various data processing techniques	Networked PCs loaded with different computer packages

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 5 (COM 101): Know the procedures for computer and data preparation method.					
8	5.1 Be able to explain how to operate a computer system	Discuss the principles and procedures of operating the computer system, the fix up, start up and shut-down systems	White Board. PC loaded with Power point and connected to OHP Diskettes	Be able to boot and shut down computer system Format diskettes	Guide the students on how to operate the computer. Show different storage media to students	Networked PCs and storage media such as diskette.
9	5.2 Understand the initialization and formatting of storage media.	Discuss initialization and formatting of storage devices such as disks and diskettes	White Board. PC loaded with Power point and connected to OHP Diskettes	Be able to boot and shut down computer system Format diskettes	Guide the students on how to operate the computer. Show different storage media to students	Networked PCs and storage media such as diskette.
	General Objective 6 (COM 101): Understand security and safety procedures within a computer environment.					
10	6.1 Understand data control techniques, operating procedure of a computer installation, safety regulation in computer installation, method of preventing hazards such as fire, flooding and sabotage	Explain data control techniques. Describe standard operating procedures of a computer installation. Explain the need for computer room security. Explain computer system auditing Explain methods of preventing hazards fire, flooding sabotage etc.	White Board PC loaded with relevant software packages and connected to OHP	Be able to formulate passwords.	Guide students on how to formulate simple password that they could easily remember	Networked PCs and storage media such as diskette.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
11	6.2 Understand security methods in computer installation and the need for users passwords	Describe file security methods in computer installations. Explain the need for file security in computer installation. Explain the user passwords and user name.	White Board PC loaded with relevant software packages and connected to OHP	Be able to formulate passwords.	Guide students on how to formulate simple password that they could easily remember	Networked PCs and storage media such as diskette.
	General Objective 7 (COM 101): Understand the concept of a computer network					
12	7.1 Define and explain network, 7.2 Describe different types of network organization such as star, ring and bus.	Define computer network. Explain different types of network organization such as star, ring, bus etc.	White Board PC loaded with power point and connected to OHP	Be able to identify various computer topologies Find out different organizations using the different topologies.	Guide the students on how to identify various network topologies.	Networked PCs and storage media such as diskette.
13	7.3 Explain LAN and WAN.	Describe different types of network: LAN, WAN	White Board PC loaded with power point and connected to OHP	Be able to identify various computer topologies Find out different organizations using the different topologies.	Guide the students on how to identify various network topologies.	Networked PCs and storage media such as diskette.
	General Objective 8 (COM 101): Understand the use of the internet					
14	8.1 Define internet and describe its resources 8.2 Explain the processes involved in searching the internet for materials.	Define internet Describe resources of internet Explain the processes involved in browsing and	White Board. PC loaded with power point and internet browser and connected to OHP	Be able to Search for materials on the internet.	Guide students on how to search for materials on the internet.	Networked PCs connected to the internet.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
		searching the internet. Explain the meaning of ISP.				
15	8.3 Explain the concept of E-mail	Explain the concept of e-mail address. Describe the processes of acquiring an e-mail address. Describe the process of sending and receiving an e-mail.	White Board. PC loaded with power point and internet browser and connected to OHP	Compose and send E-mail.	Demonstrate how to compose and send E-mail.	Networked PCs connected to the internet.

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test %; Practical %; Projects %; Examination %

Type of Assessment	Purpose and Nature of Assessment (COM 101)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 2 progress tests for feed back.	20
Practical	At least 5 home works to be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Introduction to Digital Electronics

Department/ Programme: Computer Science (ND)			
Course: Introduction To Digital Electronics	**Course Code: com 112**	**Contact Hours:**	**4 hours/week**
Year: 1 Semester: I	**Pre-requisite:**	**Theoretical:** **Practical:**	**2 hours/week** **2 hours /week**

General Objectives:

On completion of this course, the diplomats should be able to

1.0 Understand number system, codes and code conversion.
2.0 Know the fundamental of Boolean Algebra
3.0 Know the implementation of the addition operation in the computer.
4.0 Understand small -Scale Integrated Circuit
5.0 Understand the concept and methodology of sequential circuit design.
6.0 Understand counter and Data transfer.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1.0: Understand number system, codes and code conversion.					
1-3	**Ability to:** 1.1 Describe the binary, octal, decimal and hexadecimal number system. 1.2 Convert from one number system to another e.g. decimal to binary. 1.3 Define a code. 1.4 Explain the conversion from one code to another. 1.5 Describe and explain a code. 1.6 Describe the BCD code, excess-three code and 2+421 codes. 1.7 Describe the conversion from one code to another e.g. from BCD to excess-three code. 1.8 Describe the seven-segment display code.	The teacher should: - Explain flowcharts and show how flowchart can help in solving problems. - Describe the code, BCD was excess three code and 2x421 codes. - Describe conversion from one code to another. - Describe the seven-segment. - Display code.	PC connected to an OHP projector. Power point presentation of lecture notes. Online lecture notes. White board.	Ability to develop formulas using Excel spread sheet to convert Binary numbers, into other number systems. Convert from one code to another.	Assist student in their practical work.	Networked PC lab, with MS office professional.
	General Objective 2.0: Know the fundamental of Boolean Algebra					
4 -7	2.1 Sate the Boolean postulates: the commutative law, associative law, Distributive law, identify law, Negation Law, Redundancy law, and De Morgan's theorem. 2.2 Construct a truth table for up to 4 variables. 2.3 Form logic expression from statements of conditions. 2.4 Minimize a logic expression algebraically. 2.5 Explain a karnaugh map (K.Map) 2.6 Constructa.K -Map for 2,3,4 variable. 2.7 Minimize a logic expression using a k-map	2.1 State, explain and relate the Boolean postulate request the student to list examples of Boolean pastorate's application. 2.2 Design a truth table for up to 4 variables. 2.3 Design logic expression from statements of condition. 2.4 Using the stated Boolean postulate explain the steps in minimizing a logic expression algebraically, there after, demonstrate the action. 2.6 Define and discuss the karnaugh map. 2.8 Progressively design a	PC connected to an OHP projector. Power point presentation of lecture notes. Online lecture notes. White board.	Ability to design and implement Boolean logical equations.	Assist student in their practical work	Networked PC lab, with MS office professional Logic Simulator packages such as Electronic work Bench, or Digital work.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
		karnaugh map for 2 variable, 3 and 4 variables and explain each step. 2.9 Use the principles in K-Map and minimize logic expression.				
	General Objective 3.0: Know the implementation of the addition operation in the computer.					
8	To understand 3.1 Design of an adder hardware.	To explain: The design of Half Adder. The design of Full Adder. The serial adder The parallel adder	PC connected to an OHP projector. Power point presentation of lecture notes. Online lecture notes. White board.	Implement various adder hardware. (Half and Full adder)	Assist student in their practical work	Networked PC lab, with MS office professional Logic Simulator packages such as Electronic work Bench, or Digital work.
	General Objective 4.0: Understand small -Scale Integrated Circuit					
9-11	**Ability to:** 4.1 List the various terminologies used to characteristics integrated circuits e.g. fan-out, fan -in threshold, heat dissipation, noise margin etc. 4.1 Explain pin connections/arrangement of ICS. 4.2 Explain the technology of TTC. 4.3 Explain all the characteristics of DTL, ECL technologies. 4.4 Explain pulse and pulse shaping.	The teacher should: Explain the various terminologies used to characterize integrated circuits. Describe some pin arrangement of ICS (Dual in-line, straight-line and circular) and apply same to solve given problem. Draw, explain and construct electronic circuits using DTL. Explain the Limitation of DTL gates. Explain and demonstrate the applications of the up and	PC connected to an OHP projector. Power point presentation of lecture notes. Online lecture notes. White board.	To note the characteristics of various logical gates. Technological advances in manufacturing gates.	Assist student in their practical work	Networked PC lab, with MS office professional Logic Simulator packages such as Electronic work Bench, or Digital work.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
		down-followers. Draw and construct the electronic circuits of logic expressions using DTL. Draw and explain the structure of TTL, ECL, EEL and then construct the electronic circuit.				
	General Objective 5.0: Understand the concept and methodology of sequential circuit design.					
12	**To understand:** 5.1 The design and operations of various bi-stables. 5.2 Digital pulse and methods of pulse shaping	The teacher to: - Explain the design of operations of R.S., D-Type, J-K, …… - Explain the digital pulse and shaping.	PC connected to an OHP projector. Power point presentation of lecture notes. Online lecture notes. White board.	To implement Bi-stable circuits	Assist student in their practical work	Networked PC lab, with MS office professional Logic Simulator packages such as Electronic work Bench, or Digital work.
	General Objective 6.0: Understand counter and Data transfer.					
13-15	**Ability to:** 6.1 Describe the operations of the basic binary ripple counter. 6.2 Describe the operation of the modules counter. 6.3 Describe a shift and transfer of data through registers.	The teach should: Describe the operation of the basic binary ripple counter. Describe the operation of the count down counter. Describe and explain the operation of the modules counter using as example Mod-6 counters. Define and explain a shift, a shift-right and a shift- round register. Describe the parallel transfer of data through registers. Describe the parallel transfer of data through registers.	PC connected to an OHP projector. Power point presentation of lecture notes. Online lecture notes. White board.	Ability to design: Counter circuits. Register circuits	Assist student in their practical work	Networked PC lab, with MS office professional Logic Simulator packages such as Electronic work Bench, or Digital work.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
		Describe a serial transfer of data through registers. Describe the serial-parallel transfer operations.				

Assessment: Give details of assignments to be used: Coursework/ Assignments 10 %; Course test 10 %; Practical 20 %; Projects %; Examination 60 %

Type of Assessment	**Purpose and Nature of Assessment (COM 112)**	**Weighting (%)**
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 1 progress test for feed back.	10
Practical / Projects	To be assessed by the teacher	20
Course work/ assignment	To be assessed by the teacher	10
Total		100

Recommended Textbooks & References:

Course: Introduction to Computer Programming

Department/ Programme: ND COMPUTER SCIENCE			
Course: INTRODUCTION TO COMPUTER PROGRAMMING	**Course Code: COM 113**	**Contact Hours:**	**60**
Year: 1 Semester: 1	**Pre-requisite:**	**Theoretical:** **Practical:**	**2 hours/week** **2 hours /week**

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

1.0 Understand features of a good program.
2.0 To understand the concept of Algorithms and flowcharting.
3.0 Understand the principles of designing algorithms for common programming problem.
4.0 Understand General modular program design principles.
5.0 Understand the procedure n solving programming problems.
6.0 Understand the various levels of programming language.
7.0 Understand the concept of debugging and maintain program.
8.0 To understand good programming practices.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: understand features of a good program.					
1	Be able to: • Define a program • Explain features of good program (Accuracy, maintenance, efficiency, reliability, etc).	• Define and explain program with concrete illustration. • Explain in details the various feature of a good program.	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal and connected to OHP.	To be able to view some programming languages in computer	To assist student view some programming languages in computer	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal in a networked laboratory
	General Objective 2: Understand the concept of Algorithms and flowcharting					
2-4	Be able to: • Define algorithm on a general • basic. • Explain features of an algorithms (e.g. please, effective, finite) • Describe the methods of algorithm representation of English language, flowchart, pseudo code, decision table, data flow diagram (DFO) etc. • Describe main ANSI flowcharts as describe algorithms. • Draw flowcharts to implement some simple programming tasks	• Describe the concept of algorithm with its features. • Give concrete examples algorithms. • Teach the various methods of oppressing algorithm with examples.	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal and connected to OHP.	To be able to draw flowcharts for simple programming problems.	To assist students in drawing flowcharts for simple programming problems.	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal in a networked laboratory

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3: Understand the principles of designing algorithms for common programming problem					
5-6	Be able to: • Design algorithm for problems involving. • Strictly sequence control structure • Selection control structure • Iteration control structure	• Show the Structure and how develop simple programming problem involving each of basic control structure. • Give class Exercise, assignments to strict to practice on. • Correct the algorithm developed by the students.	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal and connected to OHP.	To be able to write simple programs using different control structure	To assist student in writing simple programs using different control structure	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal in a networked laboratory
	General Objective 4: Understand General modular program design principles.					
7-8	Be able to: • Explain modular programming concept. • Explain top-down design technique. • Illustrate program design with program structure charts, hierarchical Network, Hierarchical. • Demonstrate each of the 4.1 - 43 above.	• Discuss the concept and advantage of modular programming • Discuss and illustrate with like programs e.g. payroll, student records, etc. • Top-down design principles.	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal and connected to OHP.	To be able to design a program using top-down technique	To assist student to design a program using top-down technique	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal in a networked laboratory
	General Objective 5: Understand the procedure in solving a programming problems					
9	Be able to: • Identify the problem and confirm it solvable. • Design algorithm for the chosen method of solution with flowcharts or pseudo codes. • Code the algorithm by using a suitable programming language. • Test run the program on the computer.	• Discuss the Stages involved developing program. • Demonstrate the stages above with real life program possible.	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal and connected to OHP.	To be able to code a simple algorithm using any suitable language.	To assist student in coding a simple algorithm using any suitable language.	. PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal in a networked laboratory

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 6: 0 Understand the various levels of programming languages					
10-11	Be able to: • Explain machine language, low-level language and High level languages • Give examples of the languages stated above. • Explain the distinguishing features of languages in 6.1. • Distinguish between system commends and program statements.	• Discuss the feature of machine language, low level language, and high level language. High light the advantages and disadvantage of level of programming layout	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal and connected to OHP.	To be able to code a very simple high level language and translate it to assembly language.	To assist student code a very simple high level language and translate it to assembly language.	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal in a networked laboratory
	General Objective 70 Understand the concept of debugging and maintaining program:					
12	Be able to: • Define debugging. • Identify sources of bugs in a program • Explain syntax, run-time and logical errors. • Identify techniques of locating bugs in a program • Explain program maintenance. • Distinguish between debugging and maintaining a program	• Discuss various methods of debugging, aids. • High light classes • Differentiate between debugging and maintenance. • Discuss sources of bugs in program	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal and connected to OHP.	To be able to create a simple bug in a simple program and correct it	T assist student create a simple bug in a simple program and correct it	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal in a networked laboratory
	General Objective 8: To understand good programming practices					
13-14	Be able to: • Employ structured approach to both flowcharting and program development. • Employ program documents technique HIPS, data flow diagram, pseudo-cal. • Explain graphic user interface, GUI. • Define interactive processing.	• Discuss structured approach to flowcharting and programming..	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal and connected to OHP.	To be able to write simple structured program	To assist student write simple structured program	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal in a networked laboratory

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 9: Understand the concept of object oriented programming.					
15	Ability to understand: • The concept of OO programming. • the features of OO programming. • the concept of properties, events, objects and classes.	- Explain object oriented (00) program. - State the features of OOP - Explain the concept of properties - Know the obstacles to internet growth in Nigeria. - Discuss writes, methods, events, objects and classes. - List various objects oriented programming languages - State The advantages of OOP	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal and connected to OHP.	To be able to identify properties, events, objects and class in a running OOP	To assist students identify properties, events, objects and class in a running OOP	PC loaded with traditional languages such as Basic, Cobol, Fortran etc and OO languages Such as VB, OO-COBOL, OO-Pascal in a networked laboratory

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test 20 %; Practical %; Project 20s %; Examination 60 %

Type of Assessment	Purpose and Nature of Assessment (COM 113)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 1 progress test for feed back.	20
Practical / Projects	To be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Descriptive Statistics I

Programme: Statistics (National Diploma)			
Course: Descriptive statistics I	**Course Code: STA 111**	**Contact Hours:**	**45**
Year: 1 Semester: 1	**Pre-requisite:**	**Theoretical:** **Practical:**	**1 hour /week** **2 hours /week**

Goal: This course is designed to enable students to acquire a basic knowledge of descriptive statistics.

General Objectives: On completion of this course the diplomate, should be able to:

1. Understand the nature of statistical data, their types and uses
2. Understand the procedures for collection of statistical data.
3. Understand the difference between total coverage and partial coverage in data collection
4. Understand the methods of data compilation
5. Understand the methods of data presentation

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1 (STA 111): Understand the nature of statistical data, their types and uses					
1	1.1 Define Statistics 1.2 Identify various sources of statistical data 1.3 State important uses of statistics	Explain the nature of statistics Introduce various sources and discuss how they are used (e.g. social, economic, health, biological, demographic and industrial)	Books of recorded statistics Internet	Locate sources of statistical data Identify sources for specific needs	Encourage investigating sources Encourage use of Internet	Books of recorded statistics Internet Text books
2	1.4 State uses of statistical data 1.5 Explain quantitative data 1.6 Identify various scales of measurement	Explain uses of data Explain nature of quantitative data Discuss various scales (e.g. nominal, interval, ratio and ordinal).	Books of recorded statistics Internet	Decide on use of data found Determine scale of measurement of data found Comment on effectiveness	Encourage investigating sources Encourage use of Internet	Books of recorded statistics Internet Textbooks
	General Objective 2 (STA 111): Understand the procedures for collection of statistical data					
3	2.1 Describe basic sampling techniques: 2.2 Distinguish between the following methods of data collection	Discuss simple random sampling, Discuss systematic sampling Discuss stratified sampling Discuss quota sampling.	Textbooks Lecture notes	Determine the concept of random sampling using simple data	Discuss simple random sampling,	Textbooks Lecture
4	2.3 Design questionnaires and formats for data collection 2.4 Identify the problems and types of errors that arise in data collection.	Explain and discuss the process of carrying out field work to collect data.	Textbooks	Identify types of errors in data collection	Encourage students to carry out field work to collect data.	Textbooks
5	2.5 Collect data on various sources listed in 1.2 above. 2.6 Collect primary and secondary data	Explain and discuss the process of carrying out field work to collect data.	Textbooks	Identify types of errors in data collection	Encourage students to carry out field work to collect data	Textbooks

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
6	2.7 Collect primary and secondary data	Explain and discuss the process of carrying out field work to collect data.	Textbooks Field trip Random number table	Classify data into primary/secondary	Encourage students to carry out field work to collect data	Textbooks
	General Objective 3 (STA 111): Understand the difference between total coverage and partial coverage in data collection					
7	3.1 Distinguish between census and sampling surveys. 3.2 Explain the meaning and purpose of pilot enquires. 3.3 Identify the advantages and disadvantages of sampling.	Explain and discuss the process of undertaking a statistical sample	Field trip	Use examples to illustrate theoretical contents	Encourage students to collect statistical sample	Field trip
8	3.4 Distinguish between probability and non-probability methods 3.5 Explain the various probability-sampling methods	Explain and discuss the concepts covered	Field trip	Use examples to illustrate theoretical contents	Encourage students to collect statistical sample	Field trip
9	3.6 Explain the various non-probability sampling method purpose, judgement and quota) 3.7 Explain the use of post enumeration surveys. 3.8 Collect data applying the sampling methods in 3.5 above	Explain and discuss the concepts covered	Random number table	Use examples to illustrate theoretical contents	Encourage students to collect statistical sample	Random number table
	General Objective 4 (STA 111): Understand methods of data compilation					
10	4.1 Identify the different categories of collected data 4.2 Classify the data into the various categories	Explain and discuss the concepts covered	Statistical kits	Show ability to categorise various data collected	Explain and supervise student exercises and assess student work	Statistical kits

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
11	4.3 Verify the sorted data 4.4 Identify the different data storage methods	Explain and discuss the concepts covered	Statistical kits	Use examples to illustrate theoretical contents	Explain and supervise student exercises and assess student work	Statistical kits
12	4.5 Compile of discrete and continuous data	Explain and discuss the concepts covered	Textbooks	Use examples to illustrate theoretical contents	Explain and supervise student exercises and assess student work	Textbooks
	General Objective 5 (STA 111): Understand the methods of data presentation					
13	5.1 Identify the various types of statistical table (frequency and contingency tables, simple informative tables, table for reference, complex tables) 5.2 Explain various methods of data presentation (tabular, graphical, pictorial, text etc)	Explain and discuss the concepts covered	Textbooks Statistical tables	Demonstrate, using examples, various methods of data presentation	Explain and supervise student exercises and assess student work	Textbooks Statistical tables
14	5.3 Construct scatter diagrams frequency tables, and graphs. 5.4 Explain merits and demerits of chart/diagrams above.	Explain and discuss the concepts covered	Statistical tables	Demonstrate by examples, charts and tables	Explain and supervise student exercises and assess student work	Statistical tables
15	5.5 Present life data	Explain and discuss the concepts covered	Drawing materials	Demonstrate by examples, charts and tables	Explain and supervise student exercises and assess student work	Drawing materials

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test %; Practical %; Projects %; Examination %

Type of Assessment	Purpose and Nature of Assessment (STA 111)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	50
Test	At least 1 progress test for feed back.	10
Practical	At least 10 home works to be assessed by the teacher	40
Total		100

Recommended Textbooks & References:

Course: Elementary Probability Theory

Programme: Statistics (National Diploma)			
Course: Elementary Probability Theory	**Course Code: STA 112**	**Total Hours:**	**3**
Year: 1 Semester: 1	**Pre-requisite:**	**Theoretical:** **Practical:**	**2 hours /week** **1 hours /week**

Goal: This course is designed to introduce the student to the basic concepts of set theory and the theory of probability.

General Objectives: On completion of this course, the diplomate will be able to:

1. Understand the concept of set and set operations
2. Understand mapping, functions and relations
3. Understand the concept of permutations and combinations as used in probability
4. Understand the concept of a sample space
5. Understand the basic concepts of probability

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1 (STA 112): Understand the concept of set and set operations					
1	1.1 Define a set with set notation '{ }' and examples 1.2 Define a set, a subset, and use set notations such as 'A'. 1.3 Define elements of a set with notation 'a' 1.4 Define a subset of a set-using the notation '⊂' '⊃'.	Explain and discuss examples to illustrate sets, subsets, and notations for sets and subsets.	Textbooks and lecture notes.	Generate sets of data and classify them as sets, subsets; using appropriate notations for sets and subsets.	Explain and supervise exercises and assess students' work	Dice, coloured bulbs, etc to generate data. Then lecture note.
2	1.5 Write sets using the two different methods:- the set builder method and the roaster method 1.6 Define the null set with set notation 'φ' 1.7 Define the universal set with notation 'U'	Explain and discuss examples to illustrate sets, subsets, and notations for sets and subsets.	Textbooks and lecture notes.	Generate sets of data and classify them as sets, subsets; using appropriate notations for sets and subsets.	Explain and supervise exercises and asses students' work	Dice, coloured bulbs, etc to generate data. Then note books.
3	1.8 Define basic set operations such as union '∩', intersection '∪', complement, etc 1.9 State the laws of algebra of set 1.10 Illustrate the set operations using Venn diagrams 1.11 Prove some simple set identities	Explain and discuss examples to illustrate basic set operations and set identities.	Venn Diagrams	Demonstrate knowledge of set operations	Explain and supervise exercises and asses students' work	Textbooks Lecture notes.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 2 (STA 112): Understand mapping, functions and relations					
4	2.1 Define mapping and illustrate with examples 2.2 Define a function and illustrate with examples	Explain and discuss examples to illustrate mapping and functions	Textbooks Lecture notes.	Demonstrate the theoretical content of mapping and functions	Supervise and assess exercises on the topic	Textbooks Lecture notes.
5	2.3 Distinguish between mapping and function. 2.4 Define relation and illustrate with examples	Explain and discuss examples to illustrate mapping and functions; and relations	Textbooks Lecture notes.	Demonstrate the theoretical content of mapping and functions; and relations.	Supervise and assess exercises on the topic	Textbooks Lecture notes.
6	2.5 Distinguish between function and relation.	Explain and discuss examples to illustrate functions and relations	Textbooks Lecture notes.	Demonstrate the theoretical content of functions and relations	Supervise and assess exercises on the topic	Textbooks Lecture notes.
	General Objective 3 (STA 112): Understand the concept of permutations and combinations as used in probability					
7	3.1 Review permutations and combinations from the aspects of arrangement and selection 3.2 Distinguish between arrangements and selections	Explain and discuss examples to illustrate permutation and combination	Textbooks Lecture notes.	Demonstrate the theoretical content of permutation and combination	Supervise and assess exercises on the topic	Textbooks Lecture notes.
8	3.3 Undertake simple experiments involving permutations and combinations	Explain and discuss practical applications of the topic	Life data Textbooks Lecture notes.	Demonstrate the practical content of the topic	Supervise and assess exercises on the topic	Life data Textbooks Lecture notes.
	General Objective 4 (STA 112): Understand the concept of a sample space.					
9	4.1 Define a statistical experiment 4.2 Define a sample space and sample point. 4.3 Construct sample spaces using simple experiments such as the tossing of a coin, rolling of a die, etc.	Explain and discuss simple experiments	Textbooks Lecture notes. Statistical kits	Formulate and perform simple experiments	Supervise and assess simple experiments	Textbooks Lecture notes. Statistical kits

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
10	4.4 Define an event and illustrate with examples 4.5 Distinguish between simple and compound events 4.6 Define mutually exclusive events and illustrate with examples e.g. tossing a coin.	Explain and discuss events and combination of events.	Textbooks Lecture notes. Statistical kits	Generate events from the simple experiments undertaken in the previous week	Supervise and assess the content of the topic	Textbooks Lecture notes. Statistical kits
11	4.7 Define independent events and illustrate with examples e.g. tossing two coins 4.8 Distinguish between mutually exclusive and independent event. 4.9 Define exclusive events and illustrate with examples.	Explain and illustrate operations on events.	Textbooks Lecture notes. Statistical kits	Use events in combined expt. of tossing a coin and throwing a die to illustrate topics covered	Supervise and assess the content of the topic	Textbooks Lecture notes. Statistical kits
	General Objective 5 (STA 112): Understand the basic concept of probability					
12	5.1 Explain the Axiomatic approach 5.2 Explain the relative frequency approach 5.3 Define the probability of an event 5.4 Define probability as a function of the sample space	Explain and illustrate probability using various approaches.	Textbooks Lecture notes. Statistical kits	Demonstrate the derivation of probabilities by simple experiment	Explain and supervise exercises and assess student work	Textbooks Lecture notes. Statistical kits

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
13	5.5 Calculate the probability of an event 5.6 State the properties of probabilities of events 5.7 State and apply the addition laws of probability 5.8 State and apply to multiplication law of probability.	Explain and illustrate properties of probability.	Textbooks Lecture notes. Statistical kits	Demonstrate the derivation of probabilities by simple experiment	Explain and supervise exercises and assess student work	Textbooks Lecture notes. Statistical kits
14	5.9 Define conditional probability (including the use of tree diagram) and illustrate with examples 5.10 State the Bayes' theorem (rule)	Explain and illustrate conditional probability using various approaches.	Textbooks Lecture notes. Statistical kits	Demonstrate the derivation of conditional probabilities by simple experiments	Explain and Supervise exercises and assess student work	Textbooks Lecture notes. Statistical kits
15	5.11 Evaluate conditional probabilities using the Bayes' formula	Explain and illustrate conditional probability using various approaches.	Textbooks Lecture notes. Statistical kits	Demonstrate the derivation of conditional probabilities by simple experiments	Explain and Supervise exercises and assess student work	Textbooks Lecture notes. Statistical kits

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test %; Practical %; Projects %; Examination %

Type of Assessment	Purpose and Nature of Assessment (STA 112)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 2 progress tests for feed back.	20
Practical	At least 5 home works to be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Theory and Problems of Probability, H. L. Lipschutz

An Introduction to Contemporary Statistics, H. L. Koopmans.

Course: Logic and Linear Algebra

Programme: Statistics (National Diploma)			
Course: Logic and Linear Algebra	**Course Code: MTH 111**	**Contact Hours:**	**30**
Year: 1 Semester: 1	**Pre-requisite:**	**Theoretical:** **Practical:**	**1 hour /week** **1 hour /week**

Goal: This course is designed to provide the student with basic knowledge of logic linear algebra

General Objectives: On completion of this course, the diplomat will be able to:

1. Understand the concept of logic and abstract thinking.
2. Understand the concept of permutations and combinations
3. Undertake binomial expansion of algebraic expressions.
4. Understand the algebraic operations of matrixes and determinants

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1 (MTH 111): Understand the concept of logic and abstract thinking.					
1	1.1 Define the essential connectives, negation, conjunction, disjunction, implication and bi-implication. 1.2 Illustrate the essential connectives define in 1.1 above 1.3 Describe grouping and parenthesis in logic 1.4 Explain Truth tables. 1.5 Define tautology.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
2	1.6 Illustrate types of tautology. 1.7 Define universal quantifier and existential quantifier	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
3	1.8 Translate sentences into symbolic form using quantifiers. e.g. "some freshmen are intelligent" can be stated as "for some x,x is a freshman and x is intelligent" can be translated in symbols as (ix) (f x &ix) 1.9 Define the scope of a quantifier. eg R=Gauss was a contemporary of Napoleon S=Napoleon was a contemporary of Julius Caesar (Thus P, Q and R are true, and S is false Then find the truth value of sentences: (a) (P and Q) = R (b) (P - Q) (c) PAND Q = R - S 1.10 Define bond and "free" variables	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
4	1.11 Define term and formula. 1.12 Explain the validity of formulae	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 2 (MTH 111): Understand the concept of permutations and combinations					
5	2.1 Define permutation's and Combination 2.2 Give illustrative examples of each of 2.1 above 2.3 State and prove the fundamental principle of permutations. 2.4 Give illustrative examples of the fundamental principles of permutations. 2.5 Establish the formula $nPr = \frac{n!}{(n-r)!}$	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
6	2.6 Prove that nPr= (n-r+1) *nP_{r-1} 2.7 Solve problems of permutations with restrictions on some of the objects 2.8 Solve problems of permutations in which the objects may be repeated. 2.9 Describe circular permutations. 2.10 Solve problems of permutations of N identical objects.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
7	2.11 Establish the formula $nCr = \frac{n!}{r!(n-r)!}$ 2.12 State and prove the theorem nCr-1+ $^{n}Cr = ^{n+1}Cr$ 2.14 Explain problems of combinations with restrictions on some of the objects. 2.15 Solve problems of combination of "n" different objects taken any number of it at a time.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3 (MTH 111): Undertake the binomial expansion of algebraic expressions.					
8	3.1 Explain with illustrative examples the method of mathematical induction. 3.2 State and prove binomial theorem for positive integral index.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
9	3.3 Describe, with examples, the properties of binomial expansion.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
10	3.4 State the binomial theorem for a rational number. 3.5 State the properties of binomial coefficients	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
11	3.6 Apply binomial expansion in approximations (simple examples only).	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
	General Objective 4 (MTH 111): Understand the algebraic operations of matrixes and determinants					
12	4.1 Define Matrix 4.2 Define the special matrixes of zero matrixes e.g. zero matrix, identity matrix, square matrix, and triangular matrix, symmetric matrix.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
13	4.3 State examples for each of the matrixes in 4.2 above 4.4 State the laws of addition and multiplication of matrixes. 4.5 Illustrate the commutative, associative and distributive nature of the laws stated in 4.4 above. 4.6 Define the transpose of a matrix. 4.7 Determine a determine the minors and cofactors 2 by 2 and 3 by 3 matrixes	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
14	4.7 Define the minors and cofactors of a determinant. 4.8 Explain the method of evaluating determinants.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
15	4.9 State and prove the theorem "two rows or two columns of a matrix are identical, then the value of its determinant is zero". 4.11 State and prove the theorem "if two rows or two columns of a matrix are interchanged, the sign of the Value of its determinant is changed	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test %; Practical %; Projects %; Examination %

Type of Assessment	Purpose and Nature of Assessment (MTH 111)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 2 progress tests for feed back.	20
Practical	At least 5 homeworks to be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Functions and Geometry

Programme: Statistics (National Diploma)			
Course: Functions & geometry	**Course Code: MTH 112**	**Contact Hours:**	**3 hours/week**
Year: 1 Semester: 1	**Pre-requisite:**	**Theoretical:** **Practical:**	**2 hours /week** **1 hour /week**

Goal: This course is designed to enable the student to understand basic concepts of functions and geometry

General Objectives: On completion of this course, students will be able to:

1. Understand the concept of function and relations
2. Understand some special properties of functions
3. Understand the algebra of functions
4. Understand the fundamental elements of trigonometry
5. Understand analytic geometry of a straight line
6. Understand the concept of symmetry and their application to comic sections

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1 (MTH 112): Understand the concept of function and relations					
1	1.1 Form a Cartesian product of two sets X and Y. 1.2 Identify a relation from a set X into a set Y. 1.3 Determine the domain and range of a given function.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
2	1.4 Define a function from the set X into the set Y 1.5 Distinguish between various types of functions; the polynomial; exponential and logarithmic functions etc.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
	General Objective 2 (MTH 112): Understand some special properties of functions					
3	2.1 Distinguish between even and odd functions. 2.2 Identify 1 to 1 onto functions using appropriate examples.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
4	2.3 Form a composite function. 2.4 Determine the inverse of a function when it exists	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
	General Objective 3 (MTH 112): Understand the algebra of functions					
5	3.1 Form the sum, difference product and quotient of two functions	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
6	3.2 Determine the domain of the sum, difference, product and quotient of two functions	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 4 (MTH 112): Understand the fundamental elements of trigonometry					
7	4.1 Define the various trigonometric functions; sine; cosine, tangent; etc. 4.2 Define a radian and convert from radian to degrees and vice versa. 4.3 Derive trigonometric identities.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
8	4.4 State and prove the addition formulae 4.5 Resolve a typical trigonometric equation. 4.6 Resolve a typical trigonometric equation, using the formulae relating to half angles and double angles	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
9	4.7 Draw the graphs of the various trigometric functions 4.8 Express Acos ax + Bsin ax in the form Hsin (ax+B) as a sine wave 4.9 Identify phase shift amplitude and period	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
	General Objective 5 (MTH 112): Understand the analytic geometry of a straight line					
10	5.1 State the distance formula 5.2 Determine the slope of a straight line.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
11	5.3 State the equation of a straight line in various forms. 5.4 State the properties of parallel lines and perpendicular lines.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Learning Outcomes**	**Teacher's activities**	**Resources**
12	5.5 Determine the distance from a point to a line	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
	General Objective 6 (MTH 112): Understand the concept of symmetry and their applications to conic sections					
13	6.1 Define reflection and symmetry and illustrate with examples. 6.2 State the general equation of each conic section; circle, parabola and ellipse.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
14	6.3 Translate and rotate axes. 6.4 Solve problems relating to conic sections e.g. find centre, foci, axies of symmetry, vertices eccentricity etc.	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes
15	6.5 Draw graph each of the conic sections	Explain and discuss the concepts covered	Textbooks Lecture Notes	Demonstrate understanding of the concepts covered by solving examples	Explain and supervise student exercises and assess student work	Textbooks Lecture Notes

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test %; Practical %; Projects %; Examination %

Type of Assessment	Purpose and Nature of Assessment (MTH 112)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 2 progress tests for feed back.	20
Practical	At least 5 homeworks to be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Technical English I

PROGRAMME: ND Office Technology and Management			
Course: Technical English I	**Code: OTM 112 (GNS 101-102)**	**Credit Hours:**	**4 hours**
Semester: 1	**Pre-requisite O/L Credit in English**	**Theoretical:** **Practical:**	**2 hours/week - 50%** **2 hours/week - 50%**

Course main Aim/Goal: This course is designed to enable the student acquire the necessary language and communication skills which will enable him/her to use the English Language in a business environment and to know the techniques of correspondence**.**

General Objectives:

1.0 Develop appropriate study skills in English Language.
2.0 Know the nature of language and the basic rules of grammar.
3.0 Appreciate literary works in English.
4.0 Understand the concept of communication.
5.0 Know how to make oral and written presentations.
6.0 Know the rules of comprehension and interpretation.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's Activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's Activities**	**Resources**
	General Objective 1.0: Develop appropriate study skills using English Language.					
1	1.1 Understand the principles of good note taking and making techniques in English.	Explain the necessity for acquiring good note-making/making techniques in English.	-Flip charts -Felt pen -Textbooks -Workbooks -Close-circuit TV	Demonstrate good note-taking skill in English.	Provide assignments on note taking.	-Flip charts -Felt pen -Textbooks -Workbooks
	1.2 Understand method of note taking/making English.	Show methods of note-taking/making in English.	Model notes	List methods of note-taking/making in English.	Provide sources of information on note-taking/making.	-Library -Internet
2	1.3 Identify sources of library information.	Expose students to sources of library information in English.	Library Dictionary, reference books, etc	Classify sources of library information.	Refer students to sources of library information.	Sections of Library -Internet
	1.4 Identify information in the sources listed in 1.3.	Discuss with students how to locate the sources listed in 1.3.	As in 1.3	Locate information in the coerces listed in 1.3.	Guide students in locating the sources listed in 1.3.	As in 1.3
	1.5 Identify good reading habits in English.	Discuss the principles of good reading habits.	Class handouts	-Apply good reading habits	Set tasks and supervise activities	-Newspapers -Textbooks -Magazine - Selected Novels
	General Objective 2.0: Know the nature of language and the basic rules of grammar.					
3	2.1 List the characteristics of language.	Explain the concept of language Textbooks	Textbooks			
	2.2 Appreciate the four language skills - speaking listening, writing, & reading.	Discuss the four language skills.	Handouts	Role playing in the four language skills.	Supervise the students' activities.	Audio tapes Radio Video recorder Cd-rom
4	2.3 Understand the functions of language.	Explain the functions of language.	As in 2.2 above.	Discuss the functions in groups.	As in 2.2 above.	As in 2.2 above.
	2.4 List the uses of English Language in Nigeria.	Explain the uses of English Language in Nigeria eg as the language of Research, government, business, etc.	Resource persons from government, business, research, etc	Role playing as researchers, government officials, business, etc.	Evaluate students' activities.	
	2.5 Understand grammar and parts of speech.	Explain grammar and parts of speech.	Handouts			

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's Activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's Activities**	**Resources**
5	2.6 Understand the use of part of speech in sentences.	Analyse the use of parts of speech in sentences.	Demonstration tapes.	Work on the assigned exercises.	Provide exercise as parts of speech.	Textbooks Workbooks and related materials.
	2.7 Identify common errors in the use of parts of speech.	Explain what constitute errors in the use of parts of speech.	Class handouts Examples	Correct common errors in the use of parts of speech.	Provide passages containing common errors in parts of speech.	Passages, Extracts Speech's
6	2.8 Understand correct synthetic arrangement and punctuation marks.	Demonstrate to students correct synthetics arrangement and punctuation marks.	Handouts Examples	Construct sentences with correct syntactic arrangement and punctuation.	Set activities and provide feedback	As in 2.7 above.
	2.9 Appreciate idioms, figures of speech, and offices.	Explain idioms, figures of speech and affixes.	As in 2.7 above.	Construct sentences to illustrate idioms, figures of speech and affixes.	Set activities and provide feedback	As in 2.7 above.
	General Objective 3.0 Appreciate literacy works in English.					
7	Understand the meaning and stages of development of literature.	Define and trace the development of literature.	Literary materials. Handouts			
	Classify the literary game.	Different between the literacy genres.	Classical and modern literary works.	Analyse the characteristics of different literacy genres.	Supervise the students activity.	Class handouts Selected literary examples
8	Appreciate the terminology and functions of literature.	Explain the terminology and functions of literature such prose and fiction in terms of eg plot, setting, characterisation, etc.	As in 5.2 above	Differentiate among the following - fiction, prose, plot, setting characterisation etc.	Evaluate students activity.	Role playing of the characters.
	General Objective 4.0: Understand the concept of communication.					
9	Define and outline the process of communication.	Define and analyse the process of communication.	Textbooks, Charts, etc.			
	List the purpose of communication.	Analyse the purposes of communication	As in 4.1 above.			

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's Activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's Activities**	**Resources**
	Differentiate between communication and language.	Explain the relationship between communication and language.	As in 4.1 above.	Identify barriers to effective communication at various levels.	Evaluate students work.	Handouts
10	Appreciate the impact of interference on communication at various levels.	Explain the impact of interference on communication at various levels eg phonological, syntactic, etc.	Telephone receivers, Radio Television, etc.	Group discussion	Module the students discussion. Role plays	
	Appreciate code mixing, code switching, and dissonance in communication.	Explain code mixing code switching and dissonance in communication.	Class handouts Graphic examples			
	General Objective 5.0: Know to make oral and written presentations.					
11	5.1 List the organs and functions of speech.	Label and describe the functions of the organs of speech.	Class handouts	a. Label organs of speech. b. Classify functions of organs of speech.	Guide the students.	Handouts Oral and written speeches.
	5.2 List the phonemes of English.	Explain the phonemes of English.	Handouts	Produce correctly each of the phonemes enumerated by the teacher.	Guide the students.	
12	5.3 Appreciate the different sound contrast as demonstrated by the teacher.	Distinguish between the different sound contrasts in the consonantal and vowel systems of English Language through correct pronunciation.	Sound tracts eg video, audio, etc	Pronounce the different sound contrasts in English Language.	Evaluate students work.	
	5.4 Note the principles of effective speaking.	Explain principles of effective speaking viz, correct use of stress, rhythm, and intonation pattern.	Handouts	Give short speeches eg welcome address, stories, vote of thanks, etc.	Illustrate techniques of effective speaking.	
13	5.5 List the various types of correspondence.	Explain and illustrate the various types of correspondence, eg letter, memo, notices, etc.	Models of formal and informal letters, memo, notices, etc.	Write formal and informal letters, memos and notices.	Evaluate students' work.	

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's Activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's Activities**	**Resources**
	General Objective 6.0: Know the rules of comprehension and interpretation.					
14	6.1 Recognise the idea in a given passage as distinct from details.	Explain the concept of main idea and differentiate it from details.	Selected passages from relevant texts.	a. Identify main idea in a given passage. b. Distinguish between main idea and details.	Group work. Guide students in their work.	Selected passages handouts
15	6.2 Note the use of main idea in anticipating details.	Explain the use of main idea in anticipating specific details.	As in 6.1 above.	Predict specific details from main idea.	Evaluate students work.	
	6.3 Appreciate the use of context dues in comprehension.	Explain how to use contest dues such as definitions, restatements, and examples to aid comprehension.	As in 6.2 above	Draw conclusions from available information.	Guide and evaluate students work.	

ASSESSMENT CRITERIA			
Coursework 30%	**Course test %**	**Practical 30%**	**Other** (Examination/project/portfolio) **60%**

YEAR I SEMESTER II

Course: Introduction to Scientific Programming Language Using OO-Java

LANGUAGE

Department/ Programme: Computer Science			
Course: INTRODUCTION TO SCIENTIFIC PROGRAMMING LANGUAGE USING OO-JAVA	**Course Code: COM 121**	**Credit Hours:**	**6 hours/week**
Year: 1 Semester: 11	**Pre-requisite: COM 101**	**Theoretical:** **Practical:**	**2 hours/week** **4 hours /week**
General Objectives: On completion of this course, the diplomat should be able to: 1.0 Know Java programming Basics. 2.0 Know the use of Numerical data in Java. 3.0 Understand insatiable classes. 4.0 Understand processing input with applet. 5.0 Use selection statements. 6.0 Use Conditional Statements. 7.0 Understand characters and string. 8.0 Understand Array Processing in Java. 9.0 Understand Event driven programs. 10.0 Understand inheritance and Polymorphism			

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: Know Java programming Basics					
1-2	Be able to: • Identify the basic components of Java programs. • Distinguish two types of Java constructs Application and applets. • Differentiate between object declaration and object creation. • Describe the process of creating and running Java programs. • Apply main window and message Box classes. • Apply graphic classes.	• Show basic components of Java programs. • Compile and Run Java programs	PC Loaded with OO-JAVA Compiler, Power point package and connected to an OHP	To be able to identify different components o java and compilation of a java program	To assist student identify different components o java and compilation of a java program	PC in a networked laboratory Loaded with OO-JAVA Compiler, and Power point package and connected to Internet
	General Objective 2: Know the use of Numerical data in Java					
3-4	Be able to: • Select proper type of numerical data. • Educate arithmetic expressions using precedence rules. • Describe how memory allocation works for objects and primitive data value. • Write programs that input/output data using input and Box and out box. • Apply the incremental development technique in writing programs. • Describe how integer and real numbers are represented in memory.	• Give the • general format of Arithmetic expression. • Explain • operators precedence rules. • Evaluate • simple and complicates arithmetic expression. • Give • programming assignments	PC Loaded with OO-JAVA Compiler, Power point package and connected to an OHP	To be able to write simple java program to evaluate arithmetic expression.	To assist student to write simple java program to evaluate arithmetic expression.	PC in a networked laboratory Loaded with OO-JAVA Compiler, and Power point package and connected to Internet.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3: 0 Understand Insatiable classes					
5	Be able to: • Define a insatiable class with multiple methods and a constructor. • Differentiate between local and instance variables • Define and classes value-returning method. • Distinguish between private and public data. • Describe parameter passing in method definitions	• Using program segments, illustrate the differences between local and instance methods. • Write programs using constructor. • Explain parameter passing.	PC Loaded with OO-JAVA Compiler, Power point package and connected to an OHP	To be able to write simple java program to show different variable and passing of parameter	To assist student to write simple java program to show different variable and passing of parameter	PC in a networked laboratory Loaded with OO-JAVA Compiler, and Power point package and connected to Internet
	General Objective 4: Understand Processing input with applet					
6	Be able to: • Define applet with multiple methods. • Incorporate a simple event handling routine to as applet to process input. • Construct input processing applets.. • Convert string data to numerical data. • Apply the reserved word "This"	• Write an • applet. • Give • samples of data conversion i.e string to numeric. • Use this • is a program segment'.	PC Loaded with OO-JAVA Compiler, Power point package and connected to an OHP	To be able to write and run applets and string to numeric conversion program.	To assist student write and run applets and string to numeric conversion program.	PC in a networked laboratory Loaded with OO-JAVA Compiler, and Power point package and connected to Internet
	General Objective 5: Use Conditional statements					
7	Be able to: • Implement the IF statement. • Apply switch statement • Write Boolean expressions using relational and Boolean	• Give • different formats of IF statements. • Write • programs containing IF statement.	PC Loaded with OO-JAVA Compiler, Power point package and connected to an	To be able to write and run simple java program using IF and Nest-IF Conditional statement.	To be able to write and run simple java program using IF and Nest-IF Condition-al statement.	PC in a networked laboratory Loaded with OO-JAVA Compiler, and Power point package and

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	operations. • Nest IF statements correctly. • Apply list Box and color class.		OHP			connected to Internet
	General Objective 6: Use selection statements					
8-9	Be able to: • Apply while statement. • Apply DO-while statement • Apply for statement • Apply Next LOOP statement • Apply the repose Box class • Format output data using format class • Write simple recursive methods.	• Give the • format of all the statements. • Write • sample program containing all the statements • Write • sample format statement.	PC Loaded with OO-JAVA Compiler, Power point package and connected to an OHP	To be able to write and run simple java program using DO-WHILE and NEXT -LOOP statement.	To assist student write and run simple java program using DO-WHILE and NEXT -LOOP statement.	PC in a networked laboratory Loaded with OO-JAVA Compiler, and Power point package and connected to Internet
	General Objective 7: 0 Understand characters and string					
10	Be able to: • Describe and manipulate character data type. • Differentiate between string and string buffer classes • Distinguish between the primitive and reference data types. • Differentiate between equality and equivalence testing for string objects. • Show how objects passed to methods and returns from method.	• Illustrate • string manipulation in Java. • Write • sample programs to teach parameter passing mechanism.	PC Loaded with OO-JAVA Compiler, Power point package and connected to an OHP	To be able to write a simple java program for string manipulation	To assist student write simple java program for string manipulation	PC in a networked laboratory Loaded with OO-JAVA Compiler, and Power point package and connected to Internet

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objectives: 8. Understand Array Processing in Java.					
11-12	Be able to: • Manipulate a collection of data values using array. • Declare and use array of primitive data type. • Declare and use array of objects. • Implement 2- dimensional array as an array of arrays. • Manipulate objects using vectors. • Input array of strings using multi Input Box. • Define methods that accept array as parameters and methods that return array. • Apply self-reference pointers in methods.	• Give the general format of Arrays. • Format of arrays. • -Write Array statement. • - Write program regent to Illustrate multi input Box manipulation, and pointers in methods.	PC Loaded with OO-JAVA Compiler, Power point package and connected to an OHP	To be able to write a simple java program involving array handling	To assist student write simple java program involving array handling	PC in a networked laboratory Loaded with OO-JAVA Compiler, and Power point package and connected to Internet
	General Objectives 9: Understand Event driven programs					
13	Be able to: • Place buttons on a Frame. • Handle events • Place text field objects on a Frame • Write menus • Handle mouse events • Handle other GUI events.	• -Illustrate events driven programming with examples • -Ask students to run the examples • -Give programming exercise on event driven programs.	PC Loaded with OO-JAVA Compiler, Power point package and connected to an OHP	To be able to write a simple java event driven program	To assist students to write a simple java event driven program	PC in a networked laboratory Loaded with OO-JAVA Compiler, and Power point package and connected to Internet
	General Objectives: 10 Understand inheritance and Polymorphism					
14-15	Be able to: • Define classes, inheritance and polymorphism • Define classes with	• Use skeletal program • codes to Illustrate topics covered. • Give programming • assignment to cover	PC Loaded with OO-JAVA Compiler, Power point	To be able to write simple java program involving inheritance and polymorph -ism		PC in a networked laboratory Loaded with OO-JAVA Compiler,

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	inheritance. • Apply classes effectively with polymorphism. • State the rules of inheritance and accessibility. • Apply inheritance variables. • Explain how constructors of a class are affected by inheritance • Create instances of abstract super classes and write abstract methods. • Write programs involving inheritance and polymorphism. • Questions and answer session. • Defense of programming project.	topics. • Questions and Answer • sessions.	package and connected to an OHP			and Power point package and connected to Internet

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test 20 %; Practical %; Projects 20 %; Examination 60 %

Type of Assessment	Purpose and Nature of Assessment (COM 121)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 1 progress test for feed back.	20
Practical / Projects	To be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Introduction to Internet

Department/ Programme: COMPUTER SCIENCE - (ND)			
Course: INTRODUCTION TO INTERNET	**Course Code: COM 122**	**Credit Hours:**	**4 hours/week**
Year: One Semester: Two	**Pre-requisite:**	**Theoretical:** **Practical:**	**2 hours/week** **2 hours /week**

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

1.0 Explain 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		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: explain the concept of Internet					
1-2	Be able to: • Define Internet • Narrate History of Internet • Distinguish between internet and intranet • 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	Be able to 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.					
3-5	Be able to: • Introduce simple computer Network techniques • Classify computer network by geographical coverage. • List some major networks. • Highlight the benefits of Internet	Discuss computer networks such as APPANET, NUFNET AND MILNET Classifications of computer network. Distinguish between APPANET, NUFNET and MILNET The economics, social, political, educational and cultural benefits of Internet.	Ditto	Be able to Get 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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3: 0 Know various services on the internet					
6-8	Be able to: List and explain Internet Services Understand the meaning of cyber-café 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 Cybercafé operations. Personnel requirements of a Cybercafé eg. server/network administrator. Security devices in a cybercafé	White Board PC loaded with Power point and connected to OHP	Be able to use the various services available on the Internet.	Demonstrate how to use the various Internet services. Take the students to a cyber café	.
	General Objective 4: 0 Understand internet connectivity					
9-13	Be able to: State Basic Hardware requirements for Internet connectivity • Define a MODEM and state its functions • Explain the basic concept of wireless transmission. • Enumerate the steps required to connect to the	List and explain the basic hardware required for Internet connectivity. Discuss MODEM and its functions Explain the data transfer rate of various modem. 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	White Board. PC loaded with PowerPoint and connected to the Internet OHP Different types of MODEM	Be able to Identify different types of Modem's Connect to the Internet Identify VSAT, Radio and Dial-up links.	Show different types of Modem's to students Demonstrate how to connect to the Internet Take students to different cyber café that use VSAT, Radio and Dial-up to connect to the Internet.	Networked PC's connected to the Internet.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	Internet. • Describe various network protocol	to the internet. Explain network protocol. Give examples of network protocol State advantages of TCP/IP for Internet connectivity.				
	General Objective 5: Know obstacles to internet growth in Nigeria					
14 - 15	Be able to: • Explain obstacles to Internet growth in Nigeria. • Describe Internet Service Provider (ISP) concept. • Understand 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 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.	White Board PC loaded with PowerPoint and connected to Internet OHP A popular ISP	Be able to 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

Assessment: Give details of assignments to be used: Coursework/ Assignments 20%; Course test 10%; Practical 10%; Examination 60%

Type of Assessment	Purpose and Nature of Assessment (COM 122)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 1 progress test for feed back.	10
Practical	To be assessed by the teacher	10
Assignment	To be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Computer Packages I

Programme: Statistics (National Diploma)			
Course: Computer Packages I	**Course Code: COM 123**	**Contact Hours:**	**6 hours/week**
Year: 1 Semester: 2	**Pre-requisite:**	**Theoretical:** **Practical:**	**2 hours /week** **4 hours /week**

Goal: This course is designed to introduce the student to basic computer packages.

General Objectives: On completion of this course, the diplomate will be able to:

1. Know the existing application packages.
2. Understand word processing packages.
3. Know electronic spread sheets.
4. Know the fundamentals of accounting packages.
5. Understand presentation packages.
6. Know how to use education, medical and other packages.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1 (COM 123): Know the existing application packages.					
1	1.1 Understand the difference between systems software, program generators and application packages.	Explain the difference between systems software, program generators and application packages	White board PC Loaded with different packages and connected to an OHP	To be able to view different software packages and know their features	To assist student view different software packages and know their features	White board PC in a networked laboratory loaded with different packages and connected to internet.
2	1.2 Identify the modes of package acquisition 1.3 State the criteria for package acceptability	Identify the modes of package acquisition State the criteria for package acceptability	White board PC Loaded with different packages and connected to an OHP	To be able to view different software packages and know their features	To assist student view different software packages and know their features	White board PC in a networked laboratory loaded with different packages and connected to internet.
	General Objective 2 (COM 123): Understand word processing packages.					
3	2.1 Understand a word processing package	Explain meaning of a word processor State the advantages and use of word processors. Explain the features of the main, help and other menus.	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different assignments in word processing as may be determined by the lecturer.	Assist student carry out different assignments in word processing	White board PC in a networked laboratory loaded with different packages and connected to internet.
4	2.1 (continued) Understand a word processing package	Identify functions of word processors in other professional packages like in desk top publishing (Core/draw, PageMaker, etc) Explain use of document and non-document text processing including mail merging.	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different assignments in word processing as may be determined by the lecturer.	Assist student carry out different assignments in word processing	White board PC in a networked laboratory loaded with different packages and connected to internet.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
5	2.1 (continued) Understand a word processing package	Explain the import of graphics and the creation of drawing objects, Explain sharing of data with other users	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different assignments in word processing as may be determined by the lecturer.	Assist student carry out different assignments in word processing	White board PC in a networked laboratory loaded with different packages and connected to internet.
	General Objective 3 (COM 123): Know electronic spread sheets.					
6	3.1 Understand the concept of a spread sheet. 3.2 Understand the use of a spread sheet in a forecasting project, financial analysis, production scheduling and control and other forms of modelling. 3.5	List the types of existing spread sheets. Introduce spread sheet concepts. Explain the use of spread sheet in a forecasting project, financial analysis, production scheduling and control and other forms of modelling.	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different assignments in spreadsheets as may be determined by the lecturer.	Assist student carry out different assignments in spreadsheets	White board PC in a networked laboratory loaded with different packages and connected to internet.
7	3.3 Understand the use of spread sheet to carry out general statistical functions using cell references in a spreadsheet.	Explain carrying out general statistical functions using cell references in a spreadsheet.	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different assignments in spreadsheets as may be determined by the lecturer.	Assist student carry out different assignments in spreadsheets	White board PC in a networked laboratory loaded with different packages and connected to internet.
8	3.4 Understand the use of a spread sheet to perform specific accounting functions and highlight data security requirements on spread sheet data. 3.5 Transfer information and	Explain performing specific accounting functions using spread sheets and highlight data security requirements on spread sheet data. Explain formatting worksheets	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different assignments in spreadsheets as may be determined by the lecturer.	Assist student carry out different assignments in spreadsheets	White board PC in a networked laboratory loaded with different packages and connected to

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	graphics between applications.	and working with formulas. Explain transfer of information and graphics between applications.				internet.
	General Objective 4 (COM 123): Know the fundamentals of accounting packages.					
9	4.1 Understand areas in accounting and financial management prone to using accounting packages. 4.2 Understand existing accounting packages highlighting facilities that make each package unique (Peach tree, DacEasy, Sage, Quick brooks.	Explain accounting and financial management Identify areas in accounting to using accounting packages. Describe an overview of the various types of available existing accounting packages highlighting facilities that make each package Explain payroll, job costing, invoicing and order processing.	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different assignments in accounting and payroll as may be determined by the lecturer.	Assist student carry out different assignments in accounting and payroll	White board PC in a networked laboratory loaded with different packages and connected to internet.
10	4.3 Understand the following accounting system: general ledger system, accounts receivable, accounts payable, 4.4 Understand payroll, job costing, invoicing and order processing.	Explain accounting and financial management Identify areas in accounting to using accounting packages. Describe an overview of the various types of available existing accounting packages highlighting facilities that make each package Explain payroll, job costing, invoicing and order processing.	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different assignments in accounting and payroll as may be determined by the lecturer.	Assist student carry out different assignments in accounting and payroll	White board PC in a networked laboratory loaded with different packages and connected to internet.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 5 (COM 123): Understand presentation packages.					
11	5.1 Understand the functions of a presentation package using power point to illustrate.	Explain the functions of a presentation package using power point. Explain types of presentation	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different presentation assignments as may be determined by the lecturer.	Assist student carry out different presentation assignments	White board PC in a networked laboratory loaded with different packages and connected to internet.
12	5.2 Understand types of presentation presentations on strategies, sales promotion, training, marketing plan, company meetings using the auto content wizard and templates.	Create presentations on strategies, sales promotion, training, marketing plan, company meetings using the auto content wizard and templates.	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different presentation assignments as may be determined by the lecturer.	Assist student carry out different presentation assignments	White board PC in a networked laboratory loaded with different packages and connected to internet.
13	5.3 Understand the use of slides to illustrate different views presentations.	Use slides to illustrate different views presentations.	White board PC Loaded with different packages and connected to an OHP	Show ability to carry out different presentation assignments as may be determined by the lecturer.	Assist student carry out different presentation assignments	White board PC in a networked laboratory loaded with different packages and connected to internet.
	General Objective 6 (COM 123): Know how to use education, medical and other packages.					
14	6.1 Undertake a general overview of educational, medical and other packages	Explain an overview of educational, medical and other packages	White board PC Loaded with different packages and connected to an OHP	Carry out an assignment using a medical package	Assist student to carry out an assignment using a medical package	White board PC in a networked laboratory loaded with different packages and connected to internet
15	6.1 (continued) Undertake a general overview of educational, medical and other packages	Explain an overview of educational, medical and other packages	White board PC Loaded with different packages and connected to an OHP	Carry out an assignment using a medical package	Assist student to carry out an assignment using a medical package	White board PC in a networked laboratory loaded with different packages and connected to internet

Assessment: Give details of assignments to be used: Coursework/ Assignments 10 %; Course test 10 %; Practical 20 %; Projects %; Examination 60 %

Type of Assessment	Purpose and Nature of Assessment (COM 123)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 1 progress test for feed back.	10
Practical	To be assessed by the teacher	20
Assignment	To be assessed by the teacher	10
Total		100

Recommended Textbooks & References:

Course: Data Structure and Algorithms

Department/ Programme: COMPUTER SCIENCE (ND)			
Course: DATA STRUCTURE AND ALGORITHMS	**Course Code COM 124**	**Contact hours:**	**4 hours/ week**
Year: One Semester: Two	**Pre-requisite:**	**Theoretical:** **Practical:**	**3 hours/week** **1 hours /week**

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

1.0 Understand concepts of data structure and tools for studying.
1.0 Know tools for studying data: symbols, relations and graph.
2.0 Know sets relations and string structure.
3.0 Know data life cycle data representation, properties of ordered and occupancy.
4.0 Know the properties of order and linear list.
5.0 Know simple linked lists.
6.0 Know non-linear structures.
7.0 Understand different sorting and searching techniques

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: Understand concepts of data structure and tools for studying.					
1	Be able to: • Define data structure • Define data attributes; name, value range, data types. • Define units for identify data character, fields, sub fields, records, files.	Discuss concept of data structure Explain data attributes, name value range and data types Explain concepts of character, fields, sub field, records and files	White Board. PC loaded with PowerPoint and connected to an OHP	Be able to use Data attributes, fields, sub fields, records and files.	Demonstrate using relevant examples Concepts of attributes, name, value range and data types. Concept of character, fields, sub field, records and files.	Networked PC's loaded with relevant software
	General Objective 2: Know tools for studying data: symbols, relations, and graph.					
2-3	Be able to: • Define symbols, relations and graph. • Explain the symbols for expressing relations among data. • Position relation cell contents, record location, transfer key. • Order relation; record rank, cell rank. • State properties of graph: routes, edge, sequences, directed and non-directed. • Describe operations such as precede, less than points to, move to, search, change, entry.	Explain the meaning of data structure. Discuss symbols, relations and graph Discuss the symbols for expressing relations among data, position relation cell contents, record location, and transfer key. Explain the properties of graph: routes, edge, sequences, directed and non-directed. Describe operations such as precede, less than points to, move to, search, change, entry.	White Board. PC loaded with PowerPoint and connected to OHP	Be able to use symbols, relations and graph.	Demonstrate using relevant examples on how to use symbols, relations and graph	Networked PC's loaded with relevant software.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3: Know sets Relations and string structure.					
4	Be able to: • Define sets and relation • Define the elements of set, subsets, super sets, Universal set and null set. • Describe set operations • Define relations. • Explain equivalence relation. • Explain composite relation	Discuss Sets and relations Concepts of subsets, super set, Universal set and null set. Develop simple programs to carry out the operation.	Ditto	Be able to write simple programs to carry out set operations	Demonstrate giving real life example. Guide the students on how to develop simple programs to carry out set operations.	Ditto
	General Objective 4: 0 Know string structure					
5	Be able to: • Define string • Explain representation: character, string length and string values. • Carry out basic operation on string assignment, sub string selection, insertion, sub string retrieval. Deletion concatenation and replacement. • Carry out set representation. • Describe storage mapping techniques for string variables.	Discuss String and its basic operations Set representation Storage mapping techniques for string variables.	Ditto	Be able to solve problems requiring the application of sting length, assignment, selection, insertion	Introduce some problems and solve them with the students	DItto
	General Objective 4: Know data life cycle data representation, properties of ordered and Occupancy					
6	Be able to: • Explain the term occupancy leans, empty, loose. • Distinguish and define birth, death and change of data. • Define a sequential list, • Explain the differences between fixed and variable length fields. • Implement fixed and variable fields.	Explain Different life cycle of data Discuss sequential list Record length outlining the fixed and variable length.	Ditto	Be able to use variable fixed length record	Demonstrate concept of fixed and variable length using appropriate examples.	Ditto

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 5: Know the properties of ordered and linear list					
7	Be able to: • Define ordered and linear list. • Explain operations that can be performed on an ordered list: append, search (including delete, sort, selection and exchange, merge, including multiway merge and balance merge.)	Define ordered and linear list. Discuss various operations that can be performed on ordered list.	Ditto	Be able to Carry out ordered list operations	Demonstrate using appropriate examples concept of ordered and linear lists. Demonstrate how to perform ordered list operations	Ditto
	General Objective 6: Know simple linked lists.					
8-9	Be able to: • Describe different types of linked list array, double linked list, queues, stock, dequeues, trees. • Explain the use of pointers. • Describe storage mapping for linked lists.	Define linked list and compare it with linear list. Explain types of linked list. Discuss different types of trees. Discuss the use of pointers	Ditto	Be able to apply linked list.	Demonstrate the push and pop operation possibly with diagram. Carry out operations on linked listse.g push and pop on stacks and all operations on over list	Ditto
	General Objective 7: Know non - linear structures.					
10-12	Be able to: • Define a tree • State properties of tree • Describe different types of tree. (General tree, binary tree) • Explain binary tree representation. Define graph, its types and properties	Discuss tree and its properties Explain binary tree representation Define graph State properties of graph: routes, queued and non-directed Describe different types of graphs: circle, loops, etc. Describe operations such as proceeds, less than etc.	Ditto	Be able to write simple program to implement trees write simple program to implement graphs	Demonstrate how to write simple program to illustrate trees Demonstrate how to write simple program to illustrate graphs	Ditto

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 8: Understand different sorting and searching techniques					
13-15	Be able to Define sorting and explain the various sorting techniques	Be able to: Define sorting Explain Comparison based sorting Explain bubble sorting algorithm Explain selection sorting algorithm Explain insertion sorting algorithm Explain linear and binary search algorithm	Ditto	Be able to implement different sorting techniques in program	Guide students on how to write programs to implement different sorting techniques Guide students on how to Perform different sorting and searching techniques Apply sorting algorithm to sort an array of objects.	Ditto

Assessment: Give details of assignments to be used: Coursework/ Assignments 20%; Course test 10%; Practical 10%; Examination 60%

Type of Assessment	Purpose and Nature of Assessment (COM 124)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 1 progress test for feed back.	10
Practical / Projects	To be assessed by the teacher	10
Assignment	To be set and assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Introduction to Systems Analysis and Design

Department/ Programme: COMPUTER SCIENCE (ND)			
Course: INTRODUCTION TO SYSTEMS ANALYSIS AND DESIGN	**Course Code: COM 125**	**Credit Hours:**	**45**
Year: Two Semester: One	**Pre-requisite: None**	**Theoretical:** **Practical:**	**2 hours/week** **1 hours /week**

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

1.0 Understand the system concepts.
2.0 Understand the stages of system analysis.
3.0 Understand the process of feasibility study it's objectives and major factors
4.0 Know the basic guide lines for writing a feasibility study report.
5.0 Understand systems implementation process.
6.0 Understand Systems Design.
7.0 Understand Data Base Design.
8.0 Understand input Design and output design.
9.0 Understand output design
10.0 Understand system implementation
11.0 Understand systems evaluation process.
12.0 Understand systems maintenance process.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: 0 Understand the system concepts.					
1	To understand: The definition of a system and its basic features. To Recognize manual and automated systems. To distinguish between manual and automated systems.	To Explain: System and its basic features. System classifications: automated, manual, To distinguish between manual and automated system. To list examples of manual and automated systems.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Recognize basic features of a system. To note differences between manual and automated system.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 2: Know the stages of system analysis					
2	**To understand:** Systems analysis and logical stages of systems development. The systems development process, planning, control and coordination	To explain: The logical stages of systems The development, initiation and preliminary survey, feasibility. The Study, investigation, analysis, design, programming, implementation, evaluation and maintenance. To explain: The system development process, planning, control and coordination.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Analyze a system. Plan, coordinate and develop a system.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3: Understand the process of feasibility study.					
3	To understand: Feasibility study, its objectives, and major factors.	• Explain feasibility study • Explain the major factors to be considered in feasibility study • Determine the objectives of the user of a feasibility study.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Set objectives and consider major factors of a system.	To assist students in their practical work.	. Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 4: Know the basic guide lines for writing a feasibility study report					
4	To understand: Features of feasibility study report. Concept of Data flow diagram. Analysis specification.	To describe: The main features of a feasibility study report. To explain: The concept of Data flow Diagram (DFD) techniques To write: analysis specification	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Perform feasibility studies Provide data flow diagram Provide system specifications.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 5: 0 Understand systems implementation process					
5	To understand: Fact finding techniques Ideal system selection Resources requirements of a system	To explain: Fact finding techniques. To select a system for development.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Do fact finding for a system. Select an ideal system for a given set of requirements.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 6: Understand systems Design					
6	To understand: • System design • System specification • Program specification • System documentation	To explain: systems design system specification To List the tools used for systems specification To Explain program specification. To list the tools used for program specification. To explain: Systems documentation (input, output, processing, access mode, etc) and standard.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Design a system according to a set system specification and to provide documentation for it.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package.
	General Objective 7: Understand Data Base Design					
7	To understand: Database design The similarities and differences between conventional and database files The design of the structures of a database file	To explain: Data Base concept. The similarities and differences between conventional files and data base files. The goals and pre-requisites for a Data Base design To show: The design and structure of a simple Data Base file.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Design a data base. To distinguish between different data base files. To design a structured data base file.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 8: Understand Input and output design					
8	To understand: • Input to a system • Methods used for data capture	To explain: The input to a system The methods used for data capture and input The current trend in automatic Data collection technology. The Prototyping and design of computer inputs	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes. Samples OMR/OCR forms, smart cads, magnetic, tapes, diskettes, and ruled papers.	Ability to: Implement data capture in a system.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
9	To understand: Current trends in automatic data collection technology. The concept of prototyping and design of computer inputs	To explain: The trends in automatic data collection Prototyping concept and its implementation.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	To implement: Automatic data capture. Ability to prototype a system.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 9: Understand Output Design					
10	To understand: The principles and guidelines The different types of outputs.	To explain: The principles and guidelines for out put design. To describe: The different types of output The output media and formats The prototyping and design of computer output	P.C. with different output devices, such as printers, plotters, and CRT display terminals	Ability to: Handel data outputs and understand its significance.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
11	To understand: The output media and formats. The concept of prototyping and design of computer output.	To explain: Different output formats The process of system prototyping.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Prototype system output. Implement different output design for different media.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package
	General Objective 10: Understand System implementation					
12	To understand; System implementation	To explain: systems implementation How to generate test data To explain: The need for data bank program installation system software installation.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Implement a system based on a set of specifications.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
13	To understand: The process of hardware and software installation. The methods used in system testing	To explain: System installation both hardware and software. How to test a system and perform fault diagnosis.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Perform hardware and software system installation. Perform testing.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 11: Understand Systems evaluation process					
14	To understand: The methods used in system evaluating, amendments and cost analysis.	To Define: system evaluation To explain: The need for system evaluation The program amendment request. System amendment To design: Amendment request form. To explain: performance variation systems cost components system cost analysis	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Perform system evaluation and cost analysis.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 12: Understand Systems Maintenance process					
15	To understand: The concepts of systems maintenance and standards.	To define systems maintenance To describe: The need for systems maintenance To state: Systems standard To explain: Users role in systems maintenance	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Maintain systems and standards.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.

Assessment: Give details of assignments to be used: Coursework/ Assignments 40 %; Course test 10 %; Practical 20 %; Examination 30 %

Recommended Textbooks & References:

Course: PC Upgrade and Maintenance

Department/ Program: ND Computer Science			
Course: PC Upgrade & Maintenance	**Course Code: COM 126**	**Contact Hours:**	**6 hours/week**
Year: One Semester: Two	**Pre-requisite:**	**Theoretical:** **Practical:**	**1 hours/week** **5 hours /week**
General Objectives: The course provides the knowledge and skills to begin PC Upgrade & Maintenance:- 1. To understand the concept of upgrading and maintenance for PC. 2. To understand the limitation of a PC and scope for upgrading. 3. To understand technical specifications for PC upgrading.			

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective: To understand the concept of upgrading and maintenance for PC					
1	To understand: The need for PC maintenance.	To provide: An introduction in PC maintenance. To explain: Typical hazards threatening the normal operation of PC. e.g. static electricity, power fluctuation, power surge, dusty environment, excessive ambiance temperature, viruses …….. The need for computer backups	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability to: 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 tools
2	To understand: The need for PC upgrade.	To explain: Technological changes in computer hardware. User demand for a higher processing power. The emergence of complicated software package.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability to: Assess the require computing power for a new application software.	To provide advice on student assessment of new required computing power.	Access to a variety of computer components Internet access to obtain the latest information on hardware and software upgrade.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective: To understand the limitation of a PC and scope for upgrading					
3	To understand: The process of hardware upgrading. How to choose hardware components for upgrading.	To explain: How to open the case of a PC. How to make a list of components to upgrade. How to get prepared for a component change (obtaining the required hardware/software tools and components). How to check and verify the specifications of new components against the new requirements.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability 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.	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.
	General Objective: To understand technical specifications for PC upgrading					
4	To understand: How to replace the computer case.	To explain: How to choose a suitable case which meets specifics requirements. How to dismantle the old computer. 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	The ability to: 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.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
5	To understand: How to replace the computer case.	To explain: How to choose a suitable case which meets specifics requirements. How to dismantle the old computer. 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	The ability to: 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.
6	To understand: How to replace the computer power supply.	To explain: How to choose a suitable power supply which meets specifics requirements. How to dismantle the old power supply computer. How to assemble the new power supply.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability to: 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.
7	To understand: How to replace the computer mainboard.	To explain: How to choose a suitable mainboard which meets specifics requirements. How to dismantle the old mainboard computer. How to assemble the new mainboard.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability to: 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.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
8	To understand: How to replace the computer CPU.	To explain: How to choose a suitable CPU which meets specifics requirements. How to dismantle the CPU. How to assemble the new CPU.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability to: 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.
9-10	To understand: How to replace the computer mass storage.	To explain: How to choose a suitable mass storage which meets specifics requirements. How to dismantle the mass storage. How to assemble the new mass storage.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability to: 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.
11	To understand: How to replace the computer display unit.	To explain: How to choose a suitable display unit which meets specifics requirements. How to dismantle the display unit. How to assemble the new display unit.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability to: 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.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
12-13	To understand: How to replace the computer add-on cards.	To explain: How to choose a suitable add-on cards which meets specifics requirements. How to dismantle the old add-on cards. 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	The ability to: 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.
14	To understand: How to replace the computer keyboard and mouse.	To explain: How to choose a suitable keyboard and mouse which meets specifics requirements. How to dismantle the old keyboard and mouse. 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	The ability to: 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.
15	To understand: How to replace the computer modems.	To explain: How to choose a suitable modems which meets specifics requirements. How to dismantle the old modems. How to assemble the new modems	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability to: 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.

Assessment: Give details of assignments to be used: Coursework/ Assignments 0%; Course test 20%; Practical lab activities 50%; Projects 0%; Examination 30%

Recommended Textbooks & References:

Course: Introduction to Systems Analysis and Design

Department/ Programme: COMPUTER SCIENCE (ND)			
Course: INTRODUCTION TO SYSTEMS ANALYSIS AND DESIGN	**Course Code COM 216**	**Credit Hours:**	**45**
Year: Two Semester: One	**Pre-requisite: None**	**Theoretical:** **Practical:**	**2 hours/week** **1 hours /week**

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

1.0 Understand the system concepts.
2.0 Understand the stages of system analysis.
3.0 Understand the process of feasibility study it's objectives and major factors
4.0 Know the basic guide lines for writing a feasibility study report.
5.0 Understand systems implementation process.
6.0 Understand Systems Design.
7.0 Understand Data Base Design.
8.0 Understand input Design and output design.
9.0 Understand output design
10.0 Understand system implementation
11.0 Understand systems evaluation process.
12.0 Understand systems maintenance process.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: 0 Understand the system concepts.					
1	To understand: The definition of a system and its basic features. To Recognize manual and automated systems. To distinguish between manual and automated systems.	To Explain: System and its basic features. System classifications: automated, manual, To distinguish between manual and automated system. To list examples of manual and automated systems.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Recognize basic features of a system. To note differences between manual and automated system.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 2: Know the stages of system analysis					
2	**To understand:** Systems analysis and logical stages of systems development. The systems development process, planning, control and coordination	To explain: The logical stages of systems The development, initiation and preliminary survey, feasibility. The Study, investigation, analysis, design, programming, implementation, evaluation and maintenance. To explain: The system development process, planning, control and coordination.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Analyze a system. Plan, coordinate and develop a system.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3: Understand the process of feasibility study.					
3	To understand: Feasibility study, its objectives, and major factors.	• Explain feasibility study • Explain the major factors to be considered in feasibility study • Determine the objectives of the user of a feasibility study.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Set objectives and consider major factors of a system.	To assist students in their practical work.	. Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 4: Know the basic guide lines for writing a feasibility study report					
4	To understand: Features of feasibility study report. Concept of Data flow diagram. Analysis specification.	To describe: The main features of a feasibility study report. To explain: The concept of Data flow Diagram (DFD) techniques To write: analysis specification	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Perform feasibility studies Provide data flow diagram Provide system specifications.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 5: 0 Understand systems implementation process					
5	To understand: Fact finding techniques Ideal system selection Resources requirements of a system	To explain: Fact finding techniques. To select a system for development.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Do fact finding for a system. Select an ideal system for a given set of requirements.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 6: Understand systems Design					
6	To understand: • System design • System specification • Program specification • System documentation	To explain: systems design system specification To List the tools used for systems specification To Explain program specification. To list the tools used for program specification. To explain: Systems documentation (input, output, processing, access mode, etc) and standard.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Design a system according to a set system specification and to provide documentation for it.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package.
	General Objective 7: Understand Data Base Design					
7	To understand: Database design The similarities and differences between conventional and database files The design of the structures of a database file	To explain: Data Base concept. The similarities and differences between conventional files and data base files. The goals and pre-requisites for a Data Base design To show: The design and structure of a simple Data Base file.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Design a data base. To distinguish between different data base files. To design a structured data base file.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 8: Understand Input and output design					
8	To understand: • Input to a system • Methods used for data capture	To explain: The input to a system The methods used for data capture and input The current trend in automatic Data collection technology. The Prototyping and design of computer inputs	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes. Samples OMR/OCR forms, smart cads, magnetic, tapes, diskettes, and ruled papers.	Ability to: Implement data capture in a system.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
9	To understand: Current trends in automatic data collection technology. The concept of prototyping and design of computer inputs	To explain: The trends in automatic data collection Prototyping concept and its implementation.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	To implement: Automatic data capture. Ability to prototype a system.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 9: Understand Output Design					
10	To understand: The principles and guidelines The different types of outputs.	To explain: The principles and guidelines for out put design. To describe: The different types of output The output media and formats The prototyping and design of computer output	P.C. with different output devices, such as printers, plotters, and CRT display terminals	Ability to: Handel data outputs and understand its significance.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
11	To understand: The output media and formats. The concept of prototyping and design of computer output.	To explain: Different output formats The process of system prototyping.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Prototype system output. Implement different output design for different media.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any other appropriate system analysis package
	General Objective 10: Understand System implementation					
12	To understand; System implementation	To explain: systems implementation How to generate test data To explain: The need for data bank program installation system software installation.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Implement a system based on a set of specifications.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
13	To understand: The process of hardware and software installation. The methods used in system testing	To explain: System installation both hardware and software. How to test a system and perform fault diagnosis.	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Perform hardware and software system installation. Perform testing.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 11: Understand Systems evaluation process					
14	To understand: The methods used in system evaluating, amendments and cost analysis.	To Define: system evaluation To explain: The need for system evaluation The program amendment request. System amendment To design: Amendment request form. To explain: performance variation systems cost components system cost analysis	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Perform system evaluation and cost analysis.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.
	General Objective 12: Understand Systems Maintenance process					
15	To understand: The concepts of systems maintenance and standards.	To define systems maintenance To describe: The need for systems maintenance To state: Systems standard To explain: Users role in systems maintenance	Pc connected to an OHP Power Point Presentation of lecture notes. Online lecture notes.	Ability to: Maintain systems and standards.	To assist students in their practical work.	Networked PC lab Internet connection SSADM package, Or any appropriate system analysis package.

Assessment: Give details of assignments to be used: Coursework/ Assignments 40 %; Course test 10 %; Practical 20 %; Examination 30 %

Recommended Textbooks & References:

YEAR II SEMESTER I

Course: Computer Programming Using OOBASIC

Department/ Programme: Computer Science (ND)			
Course: Computer Programming Using OOBASIC	**Course Code: COM 211**	**Credit Hours:**	**5 hrs/week**
Year: II Semester: I	**Pre-requisite: Com 113**	**Theoretical:** **Practical:**	**1 hour/week** **4 hours /week**

General Objectives:

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.
7.0 Understand how to create classes and functions.
8.0 Know how to create and manipulate Data Files.
9.0 Understand Data Management Concepts in OO Basic
10.0 Know how to design report formats.
11.0 Understand the Dialog box concepts.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1.0: Understand the integrated Development Environment.					
1	Be able to describe: • The Integrated Development Environment (IDE) • Project window • Toolbox • Form layout window • Properties window • 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.	Be able to 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
	General Objective 2.0: Understand the visual basic programming concept.					
2 - 3	Be able to discuss: Visual programming Event-Driving Programming. VB character set Data types Data type conversion The various types of variables The rules for forming variable names. Declaration of variables Storing and retrieving data in a variable..	Be able to discuss: Visual programming Event-Driving Programming. VB character set Data types Data type conversion The various types of variables The rules for forming variable names. Declaration of variables Storing and retrieving data in a variable.	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Be able to 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 names. Write simple program to store and retrieve data	Networked PC's loaded with OOFORTR, and a compiler

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3.0: Understand Statements, Operators, Expressions and object variables.					
4 - 5	Be able to discuss: Visual Basic Statements, Operators, Expressions, and Object variables Object variable declaration Scope of variable 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.	Be able to use operators, object data types and scope of variables 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 operators, object data type and scope of variable	Networked PC's loaded with OOFORTR, and a compiler
	General Objective 4.0: Know control statements in OOP					
7	Be able to discuss: 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.	Be able to: 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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 5.0: Know the use of procedure and functions					
8	Be able to 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. 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.	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. 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.	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	Be able to: Write program using the various variable declaration and different types of constants. Implement functions 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
	General Objective 6.0: Understand the use of Arrays and structures.					
9	**Ability to:** 5.1 Explain array declaration and subscript range. 5.2 Explain multiple array declaration. 5.3 Explain static, global and dynamic array declaration. 5.4 Explain static and dynamic allocations.	The teacher explain array and when they are required in a program. He should demonstrate the multiple arrays using a practical problem. He should illustrate and explain with example static and dynamic array declaration. The teacher should give a practical test to use student.	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	To be able to 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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objectives 7.0: Understand how to create classes and objects.					
10	7.1 Explain the constructors and destructors 7.2 Explain information guiding using private, public and protected. 7.3 Explain instances of class variables 7.4 Explain the creation of methods. 7.5 Demonstrate 7.1 - 9.4 above with a sample program.	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.	To 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
	General Objectives 8.0: Know how to create and Manipulate Data files.					
11	Ability 8.1 Describe the different types of Data files e.g. sequential, random, Binary. 8.2 Explain how to create the file types. 8.3 Explain how to read and write to the file type mentioned above. 8.4 Demonstrate 8.1 - 8.3 above with a sample.	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 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	PC loaded with Visual BASIC, compiler and connected to OHP Power Point Presentation of lecture notes. Online lecture notes.	To be able to: Create files and operate on them.	To assist students in their practical work.	Networked PC's loaded with OOFORTR, and a compiler

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
		data environment. The teacher should demonstrate and explain the importance of SQL in database access.				
	General Objective 9.0: Understand database management concept in OO BASIC.					
13	**Ability to:** 9.1 Explain Database 9.2 Describe the procedure for creating a Database 9.3 Describe the different ways of accessing a database e.g. codes, data control, and data environment. 9.4 Describe how to perform the following operations: adding, editing, updating, deleting and searching. 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.	To be able to: 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
	General Objective 10.0: Know how to design report format.					
14	**Ability to:** 10.1 Explain how to design a report format using data report object. 10.2 Describe how to retrieve output using the format in 10.1 above. 10.3 Demonstrate 10.1 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.	To be able to: 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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 11.0: Understand Dialogue Box Concepts					
15	**Ability to:** 11.1 State 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. 11.2 Write a program to demonstrate the use of 13.1 above. Revision	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.	To be able to: Write dialogue boxes	Assist students in their practical work.	Networked PC's loaded with OOFORTR, and a compiler

Assessment: Give details of assignments to be used: Coursework/ Assignments 20 %; Course test %; Practical 20 %; Projects 20 %; Examination 40 %

Type of Assessment	Purpose and Nature of Assessment (COM 215)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	40
Practical	Set and assessed by teacher	20
Projects	To be assessed by the teacher	20
Assignment	Set by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Introduction to Systems Programming

Department/ Programme: Computer Science (ND)			
Course: Introduction To Systems Programming	**Course Code: COM 212**	**Contact Hours:**	**5 hrs/week**
Year: II Semester: I	**Pre-requisite: COM 101**	**Theoretical:** **Practical:**	**2 hours/week** **3 hours /week**

General Objectives:

On completion of this course the student should be able to:

1.0 To understand the general concepts of systems programming.
2.0 Understand Assembler and Assembly Processes
3.0 Understand the compilation process
4.0 Understand the use of utilities and libraries.
5.0 Understand the functions of Operating System
6.0 Understand I/O device handlers.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1.0: To understand the general concepts of systems programming.					
1-3	Ability to understand: The concept of system programming The differences between systems programs and application programs. The differences between Assembler and operating systems. The meaning and work of 1-pass and 2-pass assembler.	To: - Define systems programming. - Define Application Programming - Differentiate between systems programs and application programs. - List examples of systems and application programs - Define Assembler r and operating systems. - Define the work of 1-pass assembler. - Define the work of 2-pass assembler.	A flip chart. OHP connected to a personal computer loaded with assembler and application programs	To be able to view a source assembly language and application programs in the computers	To assist students to view a source assembly language and application programs in the computers	Personal computers loaded with assembler and application programs in a networked laboratory connected to internet
	General Objective 2.0: Understand Assembler and Assembly Processes					
4-6	Ability to understand: The general format of an Assembly program statement. The purpose of each field of assembly language statement. The meaning of symbolic operations.	To: - Describe the general format of an Assembly (language program statement. (Label, opcode, Address, correct) - Explain the purpose of each field of assembly language statement. - List some examples and uses of operation code - List examples of symbolic operations.	A flip chart. OHP connected to a personal computer loaded with assembler and application program	To be able to write a simple assembly language program using the general format.	To assist students in writing simple assembly language program using the general format.	Personal computers loaded with assembler and application programs in a networked laboratory connected to internet

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3.0: Understand the compilation process.					
7	**Ability to understand:** The meaning of translation compilation and interpretation. The stages of translation. .	**To:** - Define translation: Compilation and interpretation. - Describe multi-pass and single-pass compilation. - Explain the load and go process. - Explain interpretation - Differentiate between interpretation and compilation - Define tokens and delimiters - Describe the scanning process - Explain sentence recognition - Describe types of tables generated in the process of compilation e.g inter table, symbol table, etc. - Explain code generation and code optimization. - Describe error Handling	A flip chart. OHP connected to a personal computer loaded with assembler and application program	To be able to write and compile a simple assembly language program and handle the errors	To assist the students in writing and compiling a simple assembly language program and handle the errors	Personal computers loaded with assembler and application programs in a networked laboratory connected to internet
	General Objective 4.0: Understand the use of utilities and libraries.					
8-9	Ability to understand: The meaning and uses of utilities and libraries. The relationship between utilities and libraries	TO: - Explain utilities - List example of utilities - List uses of simple utilities - Describe libraries - List examples and uses of libraries - Relate utilities to library - Implement Library and utilities programs.	A flip chart. OHP connected to a personal computer loaded with assembler and application program	To be able to write and compile simple libraries and utilities assembly language program.	To be able to write and compile simple libraries and utilities assembly language program.	Personal computers loaded with assembler and application programs in a networked laboratory connected to internet

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 5.0: Understand the functions of Operating System.					
10 -12	Ability to understand: The historical development of operating systems. The importance and uses of operating System. Batch processing, multiprogramming; multiprocessing, time-sharing. Batch, real-time, time sharing and network operating system The system commands of MS-DOS, Unix, Windows operating systems.	To: ..Outline the historical development of operating systems. - Describe operating systems - Explain importance and uses of operating System. - List examples of operating on micro and main frame. - Explain batch processing, multiprogramming; multiprocessing, time-sharing. - List example of batch, real-time, time sharing and network operating system - State the system commands of MS- DOS Unix, Windows operating system	A flip chart. OHP connected to a personal computer loaded with assembler and application program	To be able to run program in different operating system such as unix and windows	To assist students to run program in different operating system such as unix and windows	Personal computers loaded with assembler and application programs in a networked laboratory connected to internet
	General Objective 6.0: Understand I/O device handlers.					
13 -15	**Ability to understand:** The process of handling 1/0 The concept of interrupts s and traps. Interrupt handling process. The operation of pooling The CPU activity in interrupt mode and pooling and the CPU status.	To: - Explain the process of handling 1/0 - Explain the concept of interrupts and traps. - Explain interrupt handling process. - Explain the operation of pooling - Explain the CPU activity in interrupt mode and pooling and note the CPU status.	A flip chart. OHP connected to a personal computer loaded with assembler and application program	To be able to write and run a simple interrupt program using assembly language	To assist student to write and run a simple interrupt program using assembly language	Personal computers loaded with assembler and application programs in a networked laboratory connected to internet

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test 20 %; Practical 20 %; Projects %; Examination 60 %

Type of Assessment	Purpose and Nature of Assessment (COM 212)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 2 progress tests for feed back.	20
Practical	At least 5 home works to be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Commercial Programming Using OOCOBOL

Department/ Programme: COMPUTER SCIENCE (ND)			
Course: Commercial Programming Using OOCOBOL	**Course Code: COM 213**	**Credit Hours:**	**6 hours/week**
Year: TWO Semester: ONE	**Pre-requisite: COM 113**	**Theoretical:** **Practical:**	**2 hours/week** **4 hours /week**

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

1.0 Understand the concept of OOCOBOL
2.0 Understand the word types and Abstract data types in OOCOBOL
3.0 Describe the Divisions of OOCOBOL Program
4.0 Understand the Identification and Environment Divisions Entries
5.0 Understand the Data Division entries
6.0 Understand OOCOBOL statements and the coding of the Procedure Division
7.0 Understand Sequential file processing
8.0 Understand Indexed file processing
9.0 Understand concepts of subprogram
10.0 Know classes and objects in OOCOBOL

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: Understand the concept of OOCOBOL					
1	Be able to discuss The object oriented concept The benefits of object oriented approach..	Discuss: Object orientation The benefits of object oriented over traditional approach	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to provide relevant examples of object orientation	Illustrate object orientation using relevant examples.	Networked PC's loaded with OOCOBOL compiler.
	General Objective 2: 0 Understand the word types and Abstract data types in OOCOBOL					
2	Be able to discuss: OOCOBOL character set, reserved words and Data types.	Discuss: OOCOBOL character set. OOCOBOL reserved words	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to recognize and use different types of reserved words in statements	Guide students to recognize the different types of OOCOBOL reserved words. Demonstrate how to use OOCOBOL reserved words in statements	Networked PC's loaded with OOCOBOL compiler.
	General Objective 3: Describe the Divisions of OOCOBOL Program					
3	Be able to discuss the various Divisions available in OOCOBOL	Discuss: The various divisions of OOCOBOL and the order in which they are coded The sections and paragraphs of the divisions.	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to _rganize the divisions along with their sections and paragraphs.	Guide students on how to organize the divisions, sections and paragraph	Networked PC's loaded with OOCOBOL compiler.
	General Objective 4: Understand the Identification and Environment Divisions Entries					
4	Be able to discuss the structure of the Identification and Environment divisions.	Discuss the structure of Identification and Environment Divisions stating clearly the sections and paragraphs contained in them	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to code Identification and Environment Divisions	Guide students on how to code Identification and Environment Divisions	Networked PC's loaded with OOCOBOL compiler.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 5: Understand the Data Division entries					
5	Be able to explain the structures of the Data Division	Discuss the overall structure of the Data division Explain the file, working-storage, screen and linkage sections Explain the picture, and value clauses	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to code Data Division for a sample problem.	Demonstrate the coding of the Data division using sample problem.	Networked PC's loaded with OOCOBOL compiler.
	General Objective 6: Understand OOCOBOL statements and the coding of the Procedure Division					
6-7	Be able to explain: • The various COBOL statements and their classification: • The various opening modes available in COBOL	Explain: The various statements used in COBOL. The Imperative, Conditional and compiler directing statements The various opening modes available. That is, e Input, Output, Extend and I-O.	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to: List and classify COBOL statements into Imperative, Conditional and Compiler directing. Code sample Procedure Division for a problem.	List the various statements available in COBOL Classify COBOL statements into Imperative, Conditional and Compiler directing. Demonstrate the use of the statements listed above. Guide students on how to code a Procedure Division for a sample problem that do not require file definitions and a sample problem that requires file definition Guide students on how to code a complete Cobol program.	Networked PC's loaded with OOCOBOL compiler.
	General Objective 7: Understand Sequential file processing					
8-9	Be able to explain: • File processing concepts. • Record update in sequential file processing.	Explain the use of file-Processing class Discuss record update in sequential File processing	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to perform Sequential file update.	Demonstrate how sequential file update is performed.	Networked PC's loaded with OOCOBOL compiler.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 8: Understand Indexed File Processing					
10-11	To understand: The key concepts in Indexed File Processing	Explain key concept in Indexed file processing.	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to code sample program that uses indexed files.	Demonstrate the use of indexed file in OO-COBOL Guide students on how to code sample program that uses file indexed.	Networked PC's loaded with OOCOBOL compiler.
	General Objective 9: Understand concepts of subprogram					
12-13	Be able to explain: • The uses of subprogram. • The concept of local and global data. • The implementation of subprogram.	Discuss subprograms, local and global data Explain the concept of a program calling a subprogram	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to code subprogram, calling program and a complete COBOL program that calls a subprogram	Guide students on how to code subprogram, calling program and a complete COBOL program that calls a subprogram	Networked PC's loaded with OOCOBOL compiler.
	General Objective 10: Know classes and objects in OOCOBOL					
14-15	Be able to explain: • The concepts of classes, objects, polymorphism, Inheritance and Encapsulation. • The concepts of class user, class builder, Dialect directive, programme name, program driver.	Discuss classes, objects, Polymorphism, Inheritance and Encapsulation. Explain class user and class Builder, Dialect Directive, program names, program driver	PC loaded with OOCOBOL compiler; Power Point and connected to OHP	Be able to build class, objects, polymorphism, inheritance and encapsulation.	Use relevant examples to demonstrate concept of classes, objects, polymorphism, inheritance and encapsulation. Guide students on how to build classes, objects, polymorphism and Inheritance in OOCOBOL	Networked PC's loaded with OOCOBOL compiler.

Assessment:

Type of Assessment	Purpose and Nature of Assessment (COM213)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	40
Test	At least 2 progress tests for feed back.	30
Practical	At least 5 home works to be assessed by the teacher	30
Total		100

Recommended Textbooks & References:

Course: File Organisation and Management

Department/ Programme: Computer Science (ND)			
Course: File Organisation and Management	**Course Code: COM 214**	**Credit Hours:**	**3 Hours/week**
Year: II Semester: I	**Pre-requisite: COM 101**	**Theoretical:** **Practical:**	**2 hours/week** **1 hours /week**

General Objectives:

On completion of this course the student should be able to:

1.0 Know simple file organization concept
2.0 Understand the concept of file operations
3.0 Understand the basic storage devices and media
4.0 Understand different file access methods and the buffering techniques.
5.0 Understand file organizational structure and processing.
6.0 Know the process of file updating, protection and security.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: Know simple file organisation concept					
1-3	Ability to understand: The concept of in computing The concept of record, field, character, byte and bits in relation to a file The seek, read, write, fetch, insert, delete and update operations Qualitatively file system performance in terms of fetch, insert, update and reorganization.	To: - Identify a file in computing - Relate record, field, character, byte and bits to a file - Explain blocks of data - Describe seek, read, write, fetch, insert, delete and update operations - Explain qualitatively file system performance in terms of fetch, insert, update and re-organization	A flip chart, A white board, OHP connected to PC loaded with appropriate software. A PC with most input and output devices that can be opened for demonstration.	To be able to write a simple program that creates and updates records of a file.	To assist students write a simple program that create and updates records of a file	OHP connected to PC loaded with appropriate software in a networked laboratory. A PC with most input and output devices that can be opened for demonstration.
	General Objective 2.0: Understand the concept of file operations					
4-6	**Ability to understand:** Different methods of file organisation in computer system (heap……) File design alternatives The different file operations; storage, retrieval, add delete, update and maintenance. Activity ratio and hit rate. Different types of files: Master file, Transaction file, Reference file, etc. The concept of master file, transaction file and activity file.	To: - Describe different methods of file organisation in computer system (heap……) - Evaluate the file design alternatives. - State illustrative examples of the application of the different design alternatives. - Explain the different file operations; storage, retrieval, add delete, update and maintenance. - Define posting. - Define activity ratio and hit rate. - Explain different types of files: Master file, Transaction file, Reference file, etc. - Differentiate among old master file, new master file, transaction	A flip chart, A white board, OHP connected to PC loaded with appropriate software. A PC with most input and output devices that can be opened for demonstration.	To be able to write a simple program for creating and maintaining different file organisation.	To assist students to write a simple program for creating and maintaining different file organisation.	OHP connected to PC loaded with appropriate software in a networked laboratory. A PC with most input and output devices that can be opened for demonstration.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
		file and activity file. - Explain the use grand father, father and son analogy.				
	General Objective 3.0: Understand the basic storage devices and media.					
7-8	Ability to Understand: Types of storage devices and media The characteristics of magnetic storage media, tape, disk, cartridge, bubble, hard disk, CD-ROM, floppy disks, zip disk, tape streamer, flash memory, optical disk.	TO; - Identify types of storage devices and media - Describe the characteristics of magnetic storage media, tape, disk, cartridge, bubble, hard disk, CD-ROM, floppy disks, zip disk, tape streamer, flash memory, optical disk. - Describe the nature and characteristics of media listed above - Describe optical storage device.	A flip chart, A white board, OHP connected to PC loaded with appropriate software. A PC with most input and output devices that can be opened for demonstration.	To be able to load and retrieve documents to and from different storage media.	To assist students to load and retrieve documents to and from different storage media.	OHP connected to PC loaded with appropriate software in a networked laboratory. A PC with most input and output devices that can be opened for demonstration.
	General Objective 4: Understand different file access methods and the buffering techniques.					
9-10	Ability to understand: Different file access types:- random access and direct access storage methods. Seek time and rotational delay The concept of a buffer and its functions The calculation of buffer requirement of a file.	TO: - State different file access types:- random access and direct access storage methods. - Define seek time and rotational delay - Explain the parameters above in relation to different access methods mentioned above. - Define a buffer - List the functions of a buffer - Calculate buffer requirement of a file.	A flip chart, A white board, OHP connected to PC loaded with appropriate software. A PC with most input and output devices that can be opened for demonstration.	To be able to write simple programs involving sequential and random access methods.	To assist students to write simple programs involving sequential and random access methods.	OHP connected to PC loaded with appropriate software in a networked laboratory. A PC with most input and output devices that can be opened for demonstration.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 5: Understand file organizational structure and processing.					
11-13	Ability to understand: File structure and organization File processing technique Acoustical data structure File generation and management File sorting and merging.	To: - Explain file structure and organization - Explain acoustical data structure - Describe table and arrays. - Describe lists. - Compare stacks and queues - Decribe plex structures - Describe the techniques of file processing: batch, real-time, on-line, serial, sequential, indexed-sequential, random, etc. - Describe methods of generating files: e.g key to tape, key to disk. - Explain file creation procedures - Describe file sorting and merging.	A flip chart, A white board, OHP connected to PC loaded with appropriate software. A PC with most input and output devices that can be opened for demonstration.	To be able to write simple program involving 1,2,3 dimensional arrays, stacks and Queues.	To assist students to write simple programs involving 1,2,3 dimensional arrays, stacks and Queues.	OHP connected to PC loaded with appropriate software in a networked laboratory. A PC with most input and output devices that can be opened for demonstration.
	General Objectives 6: Understand file update, Protection and security					
14-15	Ability to understand: The concept of file access, file protection (passwords access rights, priority status, cryptography etc) File indexing and index maintenance. File status, dumping and archiving. The problems relating to file access, protection, Security, archiving and backing up.	TO: - Describe file update procedures and file access - Explain file protection (passwords access rights, priority status, cryptography etc) - Explain indexing and index maintenance. - Describe file status - Explain dumping - Explain archiving. - List problems relating to file access, protection, Security, archiving and backing up. - Explain approaches to each problem above.	A flip chart, A white board, OHP connected to PC loaded with appropriate software. A PC with most input and output devices that can be opened for demonstration.	To be able to write a file access protection and security program.	To assist students to write a file access protection and security program.	OHP connected to PC loaded with appropriate software in a networked laboratory. A PC with most input and output devices that can be opened for demonstration.

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test 20 %; Practical 20 %; Projects %; Examination 60 %

Type of Assessment	Purpose and Nature of Assessment (COM 101)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 2 progress tests for feed back.	20
Practical	At least 5 home works to be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Computer Packages II

Programme: Statistics (National Diploma)			
Course: Computer Packages II	**Course Code: COM 215**	**Contact Hours:**	**6 hours/week**
Year: 2 Semester: I	**Pre-requisite: COM 123**	**Theoretical:** **Practical:**	**2 hours /week** **4 hours /week**

Goal: This course is designed to enable the student to acquire a better understanding of standard computer packages.

General Objectives: On completion of this course, the diplomats will be able to:

1. Understand common graphics packages
2. Understand the concept of computer aided design.
3. Understand database management.
4. Understand a data analysis package.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1 (COM 215): Understand common graphics packages					
1	1.1 Obtain awareness of different types of graphic representation e.g. pictures, drawings, charts in computer system.	Illustrate Graphics using pictures, drawings, charts and graphs.	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.
2	1.2 Obtain appreciation of the difference between DTP and computer aided design. 1.3 List the types and uses of graphics packages (e.g. drawing packages, painting, computer aided design, charting packages)	Show examples of DTP and computer aided design Carryout an overview of graphic packages in existence and if possible identify merits and demerits of each	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.
3	1.4 Obtain ability to understand how to use graphic software to produce a newsletter and flyers, certificates or other one page publication.	Collect documented samples of a newsletter, flyers and certificates and let students design to exact specification. Highlight omissions and errors.	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.
4	1.5 Design brochures and letter heads.	Collect documented samples of brochures and letterheads and let students design to exact specification. Highlight omissions and errors.	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
5	1.6 Design greetings cards, invitations and folders	Collect samples of greetings cards and similar items.	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.
6	1.7 Creating, opening and saving card presentations. 1.8 Work in different views and with slides.	Let students design using samples from templates and clip arts.	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - CorelDraw, PageMaker Windows Operating System etc.
	General Objective 2 (COM 215): Understand the concept of computer aided design.					
7	2.1 Understand layout planning and plotting 2.2 Understand how to create 3D images.	Explain the basics of AutoCAD Explain drawing with precision using the AutoCAD package. Explain controlling the drawing display in AutoCAD	Classroom computer resources - AutoCAD software	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - AutoCAD software
8	2.3 Understand the use of blocks, attributes and external references 2.4 Understand how to create layer, projection types and solid modelling.	Explain applying dimensioning and tolerancing techniques to drawing	Classroom computer resources - AutoCAD software	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - AutoCAD software

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
9	2.5 Acquire ability to carry the following using AutoCAD: (a) plan a layout and carryout plotting. (b) create three- dimensional images (c) use blocks, attributes and external references (d) create layering, projection types and solid modelling.	Explain use of manual creations to draw, plan, create and produce a complete architectural design using AutoCAD software.	Classroom computer resources - AutoCAD software	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - AutoCAD software
	General Objective 3 (COM 215): Understand database management.					
10	3.1 Understand the functions of any DBMS e.g. Microsoft Access.	Explain variable, constant, data type objects, collection, and events. Give examples of DBMS activities (update, sorting, etc.)	Classroom computer resources - Access software	Apply Access to work with sets of records such as: (a) personnel records (creation and retrieval) (b) medical records (creation and retrieval) (c) library records (creation and retrieval)	Oversee practical application of topics covered	Classroom computer resources - Access software
11	3.2 Understand data base structure.	Explain variable, constant, data type objects, collection, and events.	Classroom computer resources - Access software	Carry out the following: using the above records Find and sort data Work with queries and forms	Oversee practical application of topics covered	Classroom computer resources - Access software

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
12	3.2 (continued) Understand data base structure.	Give examples of DBMS activities (update, sorting, etc.)	Classroom computer resources - Access software	Share data between other applications Create macros Generate reports Handle run time errors and secure your data.	Oversee practical application of topics covered	Classroom computer resources - Access software
	General Objective 4 (COM 215): Understand a data analysis package.					
13	4.1 Understand the functions of data analysis packages (SPSS, SSIDM) 4.2 Understand the definition of data analysis 4.3 Acquire an overview of data analysis packages	. Explain data analysis Explain various functions of a data analysis package Give an overview of data analysis packages.	Classroom computer resources - SPSS software	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - SPSS, software
14	4.4 Understand the basics of a data analysis package. 4.5 Understand build and execute commands	Present an overview of how to use build and execute commands and read, write and code data.	Classroom computer resources - SPSS software	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - SPSS, software
15	4.6 Understand reading, writing and code of data. 4.7 Understand the presentation of statistical graphs, freer distribution and correlation analysis.	Explain (a) statistical graphs, (b) frequency distribution (c) correlation analysis (d) comparison of means (e) construction of report summary of and reproduction of statistical reports.	Classroom computer resources - SPSS software	Show understanding of topics covered	Oversee practical application of topics covered	Classroom computer resources - SPSS, software

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test %; Practical %; Projects %; Examination %

Type of Assessment	Purpose and Nature of Assessment (COM 215)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	60
Test	At least 1 progress test for feed back.	20
Practical / Projects	To be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Computer Systems Troubleshooting I

Department/ Program: ND Computer Science			
Course: Computer Systems Troubleshooting I	**Course Code: COM 216**	**Contact Hours:**	**5 hours/week**
Year: Two Semester: One	**Pre-requisite:**	**Theoretical:** **Practical:**	**1 hours/week** **4 hours /week**

General Objectives:

The course Provides the knowledge and skills to begin to repair Hardware & software

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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective: To understand the process of fault diagnosis					
1	To understand: The power on self test. Power fault diagnosis.	To explain: How to complete a fault report form The visible and audible codes. 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	The ability to: 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.
2	To understand: The usage of different software diagnostic tests for hardware.	To 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	The ability to use: Software diagnostic packages to test hardware.	To help student how to use diagnostic packages.	Personal computer loaded with diagnostics packages.
	General Objective: To understand the causes of computer start up failure					
3-5	To recognise the cause of start up failure.	To 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	PC connected to an OHP. Power Point presentation of Lectures. On line lecture	The ability to: Identify and name the type of the faults from hearing the beeps. Identify the type of faults from	To help the student to: Identify and name the type of the faults from hearing the beeps. Identify the type of faults from	Personal computer loaded with diagnostics packages.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
		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.	notes. Smart/White board	the error messages. Remedy the fault by taking appropriate hardware/software repair and /or re-instalment.	the error messages. Remedy the fault by taking appropriate hardware/software repair and /or re-instalment.	
	General Objective: To understand memory failure symptoms					
6	To understand: To recognise the cause of memory failure.	To explain: How to recognise POST error message code as memory failure. Memory failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability to: Recognise POST error message code as an indication of a memory problem. Rectify the memory problem by reinsertion or replacement.	To help student to: Recognise POST error message code as an indication of a memory problem. Rectify the memory problem by reinsertion or replacement.	Personal computer loaded with diagnostics packages.
	General Objective: To understand hard drive failure symptoms					
7	To understand: To recognise the cause of hard drive failure.	To 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	The ability to: 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	Personal computer loaded with diagnostics packages.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective: To understand floppy drive failure symptoms					
8	To understand: To recognise the cause of floppy drive failure.	To 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	The ability to: 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	Personal computer loaded with diagnostics packages.
	General Objective: To understand CD-ROM failure symptoms					
9	To understand: To recognise the cause of CD-ROM drive failure.	To explain: How to recognise POST error message code as CD-ROM failure Why data cannot be accessed from the CD-ROM drive. Why the CD-ROM drive is not registered.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability 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	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: To understand mouse and keyboard failure symptoms					
10-11	To understand: To recognise the cause of mouse and keyboard failure.	To explain: Why the mouse/keyboard are not recognise in window. Why the cursor may be	PC connected to an OHP. Power Point presentation of Lectures.	The ability to: Recognise POST error message code as an indication of a mouse/keyboard problem. Rectify the mouse/keyboard	To help students to: Recognise POST error message code as an indication of a mouse/keyboard problem. Rectify the mouse/keyboard	Personal computer loaded with diagnostics packages

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
		difficult to move. Why the cursor movements may be jerky. Why some keys may not function properly.	On line lecture notes. Smart/White board	problem by replacement and/or cleaning and part replacement.	problem by replacement and/or cleaning and part replacement.	
	General Objective: To understand Display system failure symptoms					
12-13	To understand: To recognise the cause of display system failure.	To explain: How to test the monitor connections. How to test monitor power supply. How to test a video card and reseat to check its functionality again. How to replace the video card. How to replace the motherboard if the video card is embedded in the motherboard. How to check: Windows display properties. Display adaptor in device manager.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	The ability 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.	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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective: To understand sound failure symptoms					
14-15	To understand: To recognise the cause of display system failure.	To explain how to check: Windows volume control. Device conflicts in device manager. Speaker. And reseat the sound card. And 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	The ability 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.	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

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test 20 %; Practical lab activities 50 %; Projects 0 %; Examination 30 %

Recommended Textbooks & References:

Course: Technical English II

PROGRAMME: ND Office Technology and Management			
Course: Technical English II	**Code: OTM 217 (GNS 201-202)**	**Credit Hours:**	**4 hours**
Semester: 3	**Pre-requisite Technical English I**	**Theoretical:** **Practical:**	**2 hours/week - 50%** **2 hours/week - 50%**

Course main Aim/Goal: This course is designed to consolidate the student's competence in use of English Technical in business. At the end of this course the student should understand the key rules and techniques of English in a business environment.

General Objectives:

1.0 Review the rules of grammar.
2.0 Know how to write good essay, reports, and articles.
3.0 Comprehend the difference between denotative and connotative use of words.
4.0 Understand the techniques of comprehension and summary writing.
5.0 Understand registers.
6.0 Understand the principles of correspondence.

Theoretical Content				Practical Content		
Week	**General Objective 1.0: Develop appropriate study skills using English Language.**					
	Specific Learning Outcomes	**Teacher's Activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's Activities**	**Resources**
1	1.1 Revise the concepts of phrase and clause.	Define the terms phrase in and "Clause" and explain their various types.	Passages from relevant source books	Identify structural and functional phrases and clauses.	Guide students in the identification.	Phrases and clauses from relevant source books.
2	1.2 Revisit the definition of the sentence.	Define the sentence and remind the various types.	As in 1.1	Identify structural and functional sentences.	Guide the students in the process.	Sentences from source books.
	General Objective 2.0: Know how to write good essays, reports, and articles.					
3	2.1 List the different types of essay and identify the features of each type.	List and explain the different types, and features of each type of essay.	Model essays, literature, etc Handouts	a. Generate relevant information on a given topic. b. Draw up a good outline. c. Write a good essay on a given topic.	Assign topics and evaluate students work.	Handouts
4	2.2 Understand a report; its types, uses and characteristics.	Define a report and list types. Enumerate uses and characteristics of a good report.	Model of good reports.	Write a report.	Evaluate the report.	Handouts
5	2.3 Appreciate the techniques for writing articles.	Explain techniques for writing articles.	Model essays and articles. Handouts	Write good articles for publication.	Evaluate and analyze published essays..	Newspapers Journals Magazines
	General Objective 3.0 Comprehend the difference between denotative and connotative use of words.					
6	3.1 Understand the term denotation..	Explain the term denotation.	Groups of synonyms from source books.	a. Identify words used denotatively. b. Use words denotatively.	Compare denotative and connotative usage in group of synonyms eg woman, lady, female, client, customer, patient, fear, terror, dread, etc.	Groups of synonyms from source books.
7	3.2 Understand the term connotative.	Explain the term connotation.	As in 3.1 above.	a. Identify words used connotatively. b. Use words connotatively.	Guide students and evaluate their work.	Handouts

Theoretical Content				Practical Content		
Week	**General Objective 1.0: Develop appropriate study skills using English Language.**					
	General Objective 4.0: Understand the techniques of comprehension and summary writing.					
8	4.1 Give contextual explanations to statement from a text.	Explain the techniques answering questions on comprehension at a higher level of difficulty.	Comprehension passages.	Answer questions on comprehension passages at a higher level of difficulty.	Guide and grade students work.	
	4.2. Understand summary writing types and steps in writing them.	Explain and illustrate summary writing, types, and steps in writing them.	Passages from source books.	Write, within a specified length, a good summary of a given passage.	Guide and evaluate students' work.	
9	4.3 Identify colloquialism, slangs and jargons.	Explain and illustrate colloquialisms, slangs and jargons.	Passages from relevant sources.	State appropriate use of jargons.	Guide students.	
	General Objective 5.0: Understand registers.					
10	5.1 Understand registers.	Explain registers and factors influencing them viz field, mode, tenor.	Passages from source books.	a. Identify items of register in a given passage. b. List items of register in a given passage.	Guide and evaluate students' work.	Textbooks, workbooks.
	General Objective 6.0: Understand the principles of correspondence.					
11-15	6.1 Recognise the different types of business letters.	Describe and illustrate the different types of business letters eg applications enquiry, invitation, complaints, and their replies.	Model business letters.			
	6.2 Apply suitable language for business letters.	Explain suitable language for specific types of business letter.	Handouts	Write business letters.	Guide and grade students' work.	Handouts Example of generic business letters

ASSESSMENT CRITERIA			
Coursework **30%**	**Course test** **%**	**Practical** **30%**	**Other** (Examination/project/portfolio) **40%**

YEAR II SEMESTER II

Course: Object Oriented FORTRAN

Programme: COMPUTER SCIENCE (ND)			
Course: OBJECT ORIENTED FORTRAN	**Course Code: COM 221**	**Contact Hours:**	**6 hours/week**
Year: II Semester: II	**Pre-requisite: COM 101, COM 113**	**Theoretical:** **Practical:**	**hours/week 2** **hours /week 4**

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

1.0 Know the basics of scientific programming language.
2.0 Know the basic concepts of OOFOTRAN
3.0 Understand Arithmetic Operations and Expressions
4.0 Know OOFORTRAN statements
5.0 Know control statements
6.0 Know the use and application of arrays.
7.0 Know the implementation of structured programming in OOFOTRAN
8.0 Know the use of pointers.
9.0 Know object features of OOFORTRAN

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: Know basic to Scientific programming Language					
1	Be able to discuss The features of scientific programming languages.	Discuss the futures of scientific programming languages. State examples of scientific programming languages	PC loaded with OOFORTRAN compiler; connected to OHP Power point presentation of lecture notes. On line lecture notes.	Be able to identify the scientific features in a given problem.	Guide students to identify scientific programming features in a given problem	Networked PC's loaded with OOFORTRAN compiler
	General Objective 2: 0 Know the basic concepts of OOFORTRAN					
2-3	Be able to discuss • The OOFORTRAN character set • Constants • Variables and their various types.	Describe OOFORTRAN character set. Describe constants and its various types Describe variable and its various types. List the rules for forming variables in OOFORTRAN	PC loaded with OOFORTRAN compiler; connected to OHP Power point presentation of lecture notes. On line lecture notes.	Be able to use different types of constants in FORTRAN program. Be able to form Valid variables	Guide students to use different types of constants in OOFORTRAN program Demonstrate how to form valid variables	Networked PC's loaded with OOFORTRAN compiler
	General Objective 3: Understand Arithmetic Operations and Expressions					
4-5	Be able to discuss: • the arithmetic operations in OOFORTRAN: • The standard mathematical function. • The Boolean operations. • The string operations. • The Arithmetic, Boolean and string expressions.	Describe the arithmetic operations in FORTRAN the standard mathematical functions. the Boolean operations the string operations Arithmetic, Boolean and string expressions.	PC loaded with OOFORTRAN compiler; connected to OHP Power point presentation of lecture notes. On line lecture notes.	Be able to use Mathematical, Boolean and String expressions	Guide students on how to use Mathematical, Boolean and String operators Demonstrate the use of Mathematical, Boolean and String expression using a simple OOFORTRAN program.	Networked PC's loaded with OOFORTRAN compiler

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 4: 0 Know OOFORTRAN Statements					
6	Ability to understand: • The arithmetic, Data type, input and output statements.	Discuss: OOFORTRAN arithmetic statements e.g. assignment, parameter, Data e.t.c. Data type statements e.g. integer, real, character, double precision, complex, implicit, etc. The coding convention. The input statement e.g. read The output statement e.g. writes. Formatted input statement. Formatted output statement. FORMAT statement e.g. I, F, X, T, A, H, E, D, G, L formats etc.	PC loaded with OOFORTRAN compiler; connected to OHP Power point presentation of lecture notes. On line lecture notes.	Be able to use Arithmetic, Input and Output statements in FORTRAN programs.	Demonstrate how to use Arithmetic, Input and Output statements in OOFORTRAN using simple Programs	Networked PC's loaded with OOFORTRAN compiler

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 5: Understand the control statements					
7-8	Be able to discuss • the various control statements used in OOFORTRAN e.g. block IF, Nested IF, DO-ENDDO	Discuss • Block-1F statements. • The Nested if statement. • The Base if statement. • The Logical if statement. • The Arithmetic if statement. • The Case statement. • The Conditional GOTO statement Discuss Looping using: • The DO-ENDDO statement. • The nested DO-END DO • The implied Do-ENDDO Discuss the rules governing the use of DO-ENDDO Statements Explain the stop statement.	PC loaded with OOFORTRAN compiler; connected to OHP Power point presentation of lecture notes. On line lecture notes. PC loaded with OOFORTRAN compiler; connected to OHP Power point presentation of lecture notes. On line lecture notes.	Be able to use the various Control statements Be able to use various loop statements in OOFORTRAN	Guide Students on how to use the Various Control statements available in OOFORTRAN Demonstrate how to implement looping using the various loop statements available in OOFORTRAN.	Networked PC's loaded with OOFORTRAN compiler Networked PC's loaded with OOFORTRAN compiler

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 6: Know the use and Application of Arrays					
9-11	Be able to discuss • Array • Array elements in FORTRAN • The concept of one dimensional and multidimensional arrays.	Discuss arrays Describe the use of Array elements in FORTRAN statements • Describe the use of one-dimensional Arrays. • Describe the use of multi-dimensional Arrays. .	PC loaded with OOFORTRAN compiler; connected to OHP Power point presentation of lecture notes. On line lecture notes.	Be able to implement arrays in OOFORTRAN programs	Guide students on how to implement One and Multiple dimensional arrays in OOFORTRAN program.	Networked PC's loaded with OOFORTRAN compiler
	General Objective 7: Know the implementation of structured programming in OOFOTRAN					
12-13	Be able to discuss: • the concepts of subroutine: • Automatic arrays, modules procedures, FORTRAN functions and Recursive procedure.	Discuss: Subroutines Automatic arrays Sharing of data using modules. Modules procedures FORTRAN functions Passing of functions or subroutines as argument to procedures. Recursive procedures.	PC loaded with OOFORTRAN compiler; connected to OHP Power point presentation of lecture notes. On line lecture notes.	Be able to use Subroutines, Automatic arrays, Module procedures and Recursive procedures in FORTRAN programs	Use examples to demonstrate the implementation of subroutine, Automatic arrays, Functions, Modules procedures Recursive procedures.	Networked PC's loaded with OOFORTRAN compiler

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 8: Understand the use of pointers					
14	Be able to discuss the to allocate arrays, and pointers.	Discuss Allocation of arrays Pointers	Ditto	Be able to: allocate arrays and pointers	Guide students on how to use arrays and Pointers	Networked PC's loaded with OOFORTRAN compiler
	General Objective 9: Know object oriented features of OOFORTRAN					
15	Be able to discuss: • the object oriented features of OOFORTRAN	Discuss Object Oriented programming. Describe Object Oriented features of OOFORTRAN	Ditto	Be able to identify Object Oriented Features of OOFORTRAN	Demonstrate the concept of Object oriented Programming	Networked PC's loaded with OOFORTRAN compiler

Assessment: Give details of assignments to be used: Lab Activities 25 Assignment 25%; Examination 50 %

Type of Assessment	Purpose and Nature of Assessment (COM 221)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	50
Lab Activities	Work carried out in the Lab	25
Assignment	Appropriate No of assignment set by the teacher.	25
Total		100

Recommended Textbooks & References:

Course: Seminar on Computer and Society

Department/ Programme: COMPUTER SCIENCE (ND)			
Course: SEMINAR ON COMPUTER AND SOCIETY	**Course Code: COM 225 COM 222**	**Credit Hours:**	**2 hours/week**
Year: Semester:	**Pre-requisite: None**	**Theoretical:** **Practical:**	**2 hours/week** **hours /week**
General Objectives 1. Understand the impacts of computer in society			

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: UNDERSTAND THE IMPACTS OF COMPUTER IN SOCIETY					
1	To Understand: • The purpose of Computer in Society	TO: inform students of the nature of the course and modalities for implementation Collect topics from students and approve appropriately Present seminar on some current topics and also invite other professionals/colleagues to present seminars on current topics to students.	Classroom flip charts Board PC with Power point presentation software installed			
2	• The importance of Computers in Education.					
3	• The importance of Computer in manufacturing industries.					
4	• The importance of Computers in Business, Banking and Finance					
5	• The importance of Computers in Transport.					
6	• The importance of Computers in legal forms					
7	• The importance of Computers in Tourism					
8	• Present Seminars	Arrange the students/sessions for the student's presentations. Arrange sessions for student's presentations. Solve questions for students.				
9	• Present Seminars					
10	• Present Seminars					
11	• Present Seminars					
12	• Present Seminars					
13	• Present Seminars					
14	• Present Seminars					
15	• Prepare students for Examination					

Course: Basic Hardware Maintenance

Department/ Programme: Computer Science			
Course: Basic Hardware Maintenance	**Course Code: COM 223**	**Credit Hours:**	**5 hours/week**
Year: Two Semester: Two	**Pre-requisite: COM 112**	**Theoretical:** **Practical:**	**hours/week 2** **hours /week 3**

General Objectives

1. Understand the basic electric current theory.
2. Understand the function of circuit components.
3. To be able to use basic general measuring equipments
4. Understand integrated circuit and terminologies.
5. Understand preventative maintenance of hardware components.
6. Understand diagnostic techniques involved in corrective maintenance.
7. Understand computer installation procedure.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: Comprehension of Basic Electric Theory.					
1 - 2	To understand the basic electric theory.	To explain: Voltage, Current, sources Ohm's Law Kerchief's laws Therenin theory.	White board. OHP connected to a PC. Loaded with an appropriate simulation package such as Electronic work bench.	Ability to use a Voltage /current source in a circuit, and to test and verify the electric theory.	To assist student in setting up small circuits to verify the basic electric theory, using either hardware or simulated packages.	Voltage source, various measuring devices, PC loaded with a simulation package. Function boards connected to a PC.
	General Objective 2: Understand the function of circuit components.					
3-4	To Understand the function of circuit components	To explain: The functions ratings, and application of passive circuit components. The functions, rating and applications of active circuit components.	White board. OHP connected to a PC. Loaded with an appropriate simulation package such as Electronic work bench.	Ability to test active and passive circuits.	To assist student in setting up small circuits to test circuit components of passive and active components.	Voltage source, various measuring devices, PC loaded with a simulation package. Function boards connected to a PC.
	General Objective 3: To be able to use basic general measuring equipments					
5-6	The ability to understand the operations and principles of basic measuring instruments.	To introduce and explain the operation of maintenance tools such as, Multimeters, Oscilloscopes. To explain how to use multimeters to measure current voltage, resistance, inductance, capacitance. To explain how an Oscilloscope is used to observe signals, pulses, To explain how diagnostic operations are performed in fault finding.	White board. OHP connected to a PC. Loaded with an appropriate simulation package such as Electronic work bench Oscilloscope with projection facilities.	The ability to use basic measuring equipments and perform fault diagnostics and maintenance of electrical and electronic circuits.	To assist student in using basic measuring devices to perform fault diagnostics and parameter measurements and perform repairs and maintanence of electrical and electronic circuits.	Voltage source, various measuring devices, PC loaded with a simulation package. Function boards connected to a PC.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 4: To understand integrated circuits and Terminologies.					
7 - 8	To Understand Integrated Circuit and Terminologies	To explain the Various terminologies for characterising logic circuits, such as fan out, fan in, noise margin, Voltage tolerance,….etc. State different attributes of logic families, such as Handling care, voltage tolerance, switching speeds,….etc To show some IC pin arrangement such as dual-in-line DI2, strait line, circular, quad, etc…..	White board. OHP connected to a PC. Loaded with an appropriate simulation package such as Electronic work bench with projection facilities. Data sheets of Ics various slides in electronic format to be projected.	The ability to use basic measuring equipments and perform fault diagnostics and maintenance of electrical and electronic circuit	To assist the student to perform measuring tasks, perform diagnostic operations, and maintenance.	Voltage source, various measuring devices, PC loaded with a simulation package. Function boards connected to a PC. Various IC and discrete components.
	General Objective 5: Understand preventative maintenance of hardware components.					
9 -10	To show awareness of the importance of preventative measures in system maintanence and Hardware care.	To explain: The use of maintanence log book. The importance of preventative maintenance applied to hardware. The properties of drives, such as head alignment, clearance, characteristics….etc. The steps in dust prevention procedures. How to carry out routine cleaning	PC connected to an HP projector, White board, Electronic slides showing system components and maintenance routing being performed. Audio Visual programs showing the process.	The ability to carry out preventative system maintenance.	To assist student in taking part in preventative system maintenance.	Various systems and systems Component to be used as examples.

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 6: Understand diagnostic techniques involved in corrective maintenance.					
11-12	To show awareness and understand procedures to repair and restore hardware functionality.	To explain: Trouble-shooting methodology The methods of testing IC with appropriate tools. The need for diagnostic programs. Eg partition checks, virus detectors, file allocation tables checkers ….etc. How to use diagnostic programs in restoring system functionality.	PC connected to an HP projector, White board, Audio Visual programs showing the process.	The ability to perform system repair and restoration of hardware functionality.	To assist student in carrying out system repair and restoration of hardware/software functionality.	PC and various diagnostic tools/ hardware and software.
	General Objective 7: Understand system installation procedure					
13-15	To show awareness and understand the background and procedures needed for system installation.	To explain: Site preparation methods The requirements for equipment inventory. Modular testing procedures and its advantages. How to use installation manuals The pre-installation checks of a computer system. e.g. electric voltages(220 vs. 110 Volts, physical connections…….etc	PC connected to an HP projector, White board, Audio Visual programs showing the installation process.	The ability to install systems and test its functionality.	To assist student in carrying out system installation and testing its functionality.	PC components for hardware installation. Software installation packs and relevant manuals for system installation.

Assessment: Give details of assignments to be used: Coursework/ Assignments 50 %; Lab Activities 50 %; Practical Examination 100 %

Type of Assessment	Purpose and Nature of Assessment (COM 223)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	100
Lab Activities	Work carried out in the Lab	50
Assignment	Appropriate No of assignment set by the teacher.	50
Total		100

The overall grade is 40% of the examination mark and 60% lab activities & assignment.

Recommended Textbooks & References:

Course: Management Information Systems

Programme: Statistics (National Diploma)			
Course: Management Information Systems	**Course Code: COM 224**	**Contact Hours:**	**4 hours/week**
Year: 2 Semester: 4	**Pre-requisite: COM101, COM103**	**Theoretical:** **Practical:**	**2 hours /week** **2 hours /week**

Goal: This course is designed to enable introduce students to management information systems

General Objectives: On completion of this course the diplomat 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		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1 (COM 224): Know different systems.					
1	1.1 Understand a system and its characteristics. 1.2 Understand the taxonomy of systems; deterministic, probabilities, static, dynamic etc. 1.3 Understand 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.	To be able to 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 (COM 224): Understand systems theory.					
2	2.1 Understand closed and open loop systems. 2.2 Understand feedback control n a system 2.3 Understand a system model 2.4 Understand 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.	To be able to 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 (COM 224): Understand the concept of management information.					
3	3.1 Understand management and it's functions	Define management List the functions of management	A flip chart. OHP connected to PC. Power point presentation of	To be able to 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.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
			Lecture notes. On line lecture notes. White board.			
4	3.2 Understand information needs of management levels. 3.3 Understand 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.	To be able to 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 (COM 224): Know the features of management information systems (MIS)					
5	4.1 Understand an information system and it's characteristics. 4.2 Understand a 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.	To be able to 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

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 5 (COM 224): Understand the concept of transaction processing.					
6	5.1 Understand the concept of data and information 5.2 Understand data capture 5.3 Understand verification and validation 5.4 Understand data processing stages 5.5 Understand 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.	To be able to 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 6 (COM 224): Understand the concept of office automation.					
7	6.1 Understand office automation and it's components, e-mail, voice mail, fax machine, teleconferencing 6.2 Understand telecommuting 6.3 Understand the importance of office automation (OA) to an organization	Define office automation. Explain components of office a Automation 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.	To be able to 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

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 7 (COM 224): Understand the different applications of MIS.					
8	7.1 Understand various types of information systems and their objectives. 7.2 Recognise the elements required for any information system 7.3 Understand reports required for any types of information system	List the various types of information system. Explain the objectives of 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.	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 developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.
9	7.4 Understand sources of data for each type of information system 7.5 Understand 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 developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.
	General Objective 8 (COM 224): Understand the principles of decision making					
10	8.1 Understand the stages in decision making 8.2 Understand various approaches to decision making 8.3 Undertake 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.	To be able to 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

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 9 (COM 224): Know the development cycle of an MIS					
11	9.1 Understand 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.	To be able to 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.
12	9.2 Understand 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.	To be able to 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 10 (COM 224): Understand the principles of project management.					
13	10.1 Understand project management and its objectives. 10.2 Understand 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.	To be able to 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.

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 11 (COM 224): Understand total systems.					
14	11.1 Understand the objectives of a total system. 11.2 Understand rationalization of information flows, timing and accuracy of destination of output.	State the objectives of a total system Explain rationalizing information flows, timing and accuracy of destination of output.	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 developing a simple MIS	OHP connected to PC. Networked PC laboratory, with internet access loaded with MIS packages.
15	11.3 Understand the effect of time lag on inputs 11.4 Understand 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.	To be able to 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.

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test %; Practical %; Projects %; Examination %

Type of Assessment	Purpose and Nature of Assessment (COM 224)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	50
Test	At least 2 progress tests for feed back.	20
Practical	At least 5 homework to be assessed by the teacher	30
Total		100

Recommended Textbooks & References:

Course: Web Technology

Department/ Programme: COMPUTER SCIENCE ND			
Course: WEB TECHNOLOGY	**Course Code: COM 225**	**Credit Hours:**	**6 hours/week**
Year: 2 Semester: 2	**Pre-requisite: COM 122**	**Theoretical:** **Practical:**	**2 hours/week** **4 hours /week**

GENERAL OBJECTIVES: On completion of this course the student 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		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1:					
1	Ability to understand • Internet concept • Web (WWW) definition • WWW history outline • Anatomy of WWW connection • how a WWW page works • how mark-up languages work • How hypertext works • How Universal Resource Location (URL) works	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 URL works.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Ability to brose 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
	General Objective 2: Understand creation and customizing in HTML					
3	Ability to understand • Functions of HTML. • Planning of an HTML document. • Writing of an HTML document. • Preview and editing of a web page. • Creating links to other web pages. • Printing of an HTML document. • Creation of ordered/unordered list in HTML document. • Customizing font and Controlling font selection • Aligning text in HTML document.	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.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	To write a simple HTML based document To Create a simple web page. To be able to 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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
4	To understand how to: • Insert graphic insertion and specify graphic size. • Link graphics in HTML document. • Insert on image map in HTML document. • Add background image in HTML document. • Explore multimedia options.	2.11 Insert graphics and specify graphic size. 2.12 Link graphics in HTML document. 2.13 Insert on image map in HTML document. 2.14 Add background image in HTML document. 2.16 Explore multimedia options.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Ability to: 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
5	To understand 2.11 Use of forms to control input. 2.12 Creating a text entry field. 2.13 Adding radio buttons. 2.14 Adding checkboxes 2.21 Creating a pull down menu 2.22 Adding a push button 2.23 Connecting forms back end.	2.15 Use forms to control input. 2.16 Create a text entry field. 2.17 Add radio buttons. 2.18 Add checkboxes 2.21 Create a pull down menu 2.22 Add a push button 2.23 Connect a forms back end.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	To 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
6	Ability to understand • table creation and manipulations • pay out control • creation of navigational bar, tramerat, and target links. • formatting frame borders • creating a structuring table • adding two toned background • creating a template	2.24 Work with tables; create a simple table span rows. 2.25 Format borders modify table backgrounds, change table dimensions; align table counters; portion page elements. 2.26 Control pay layout. 2.27 Create a navigational bar. 2.28 Create a tram rat 2.29 Create target links 2.30 Format frame boarders 2.31 Create a structuring table 2.32 Add a two toned background 2.33 Create a template.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	The ability to Plan a table out illustrate table concepts. Illustrate web principles.		Networked PC Lab connected to the internet.. Web application packages such as Dream weaver, MS front page

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 3: Understand scripting for HTML.					
7 -8	To understand 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	Ability to: 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
	General Objective 4: Understand Dynamic Hypertext mark-up language (DHTML).					
9 -10	To understand DHTML, its building blocks, object models design.	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 4.7 Research into code architecture 4.8 Keep up with DHTML charges.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	The ability to 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
	General Objective 5: Understand cascading style sheets					
11	To understand creation of embedded style sheet, class criterion, and Browser detect.	Explain 5.1 Show and hide page elements 5.2 Change font size dynamically 5.3 Control font colour dynamically 5.4 Use external style sheet for above.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	The ability to: Create an embedded style sheet, and class. Implement browsers detection. Show and hide page elements Chang font size, font colour dynamically 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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 6: 6.0 Understand dynamic content.					
12	To understand the dynamic content by • inserting and deleting dynamically • Replacing graphics dynamically • Bind and manipulate data dynamically	Explain dynamic content by • Inserting content dynamically • Deleting content dynamically • Modifying, Content Dynamically • Incorporating assent advanced content function. • Replacing graphics dynamically. • Bind data • Manipulate bound data dynamically.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Ability to: Insert, delete, and modify content dynamically. Incorporate assent advanced content function. Replace graphics, bind data dynamically.	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 7.0 Know web development tools.					
13	To understand: The tools for Web development.	Explain how to 7.1 Position an element absolutely. 7.2 Position an element relatively 7.3 Size an element manually 7.4 Stack screen elements 7.5 Add a scroll bar 7.6 Create a side bar 7.7 Incorporate an advanced positioning function.	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Ability to: 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
	General Objective 8: Understand Multimedia					
14	To understand: The operation of Web application development Packages	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	Ability to: Use web application software and to develop a simple web application.	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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 9: Understand the operation and usage of XML					
15	To understand: The operation and application of	To provide: An introduction to XML To demonstrate how XML is used To explain the advantages of using XML	P.C connected to OHP Power point presentation of Lecture notes. On line lecture notes	Ability to: 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

Assessment: Give details of assignments to be used: Coursework/ Assignments 20 %; Course test 10 %; Practical 50 %; Projects %; Examination 20 %

Type of Assessment	Purpose and Nature of Assessment (COM 225)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	20
Test	At least 1 progress test for feed back.	10
Practical / Projects	To be assessed by the teacher	50
Course work/ assignment	To be assessed by the teacher	20
Total		100

Recommended Textbooks & References:

Course: Computer System Troubleshooting II

Department/ Program: ND Computer Science			
Course: Computer System Troubleshooting II	**Course Code: COM 226**	**Contact Hours:**	**5 hours/week**
Year: Two Semester: Two	**Pre-requisite: COM 216**	**Theoretical:** **Practical:**	**1 hours/week** **4 hours /week**

General Objectives:

The course Provides the knowledge and skills to begin to repair Hardware & software

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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective: Serial, parallel and USB problems					
1-2	**To understand**: The cause of serial, parallel and USB port failure.	**To explain:** How to recognise POST error message code as serial, parallel and USB failure. Serial, parallel and USB failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	**The ability 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	**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: To understand printers failure symptoms problems					
3-4	**To understand**: The cause of printer's failure.	**To explain:** How to recognise POST error message code as printer's failure. To 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	**The ability to**: 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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective: To understand MODEM failure symptoms problems					
5-6	**To understand**: The cause of MODEM failure.	**To 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	**The ability to**: 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: To understand common windows start-up failure symptoms					
7-8	**To understand**: The cause of windows start-up failure.	**To explain:** How to recognise POST error message code as windows start-up failure. To 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	**The ability 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	**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

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective: To understand illegal operational failure symptoms					
9-10	**To understand**: The cause of illegal operational failure.	**To 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	**The ability to**: 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: To understand virus protection utility failure symptoms					
10-11	**To understand**: The cause of virus protection utility failure.	**To explain:** How to recognise POST error message code as virus protection utility failure. virus protection utility failure remedy.	PC connected to an OHP. Power Point presentation of Lectures. On line lecture notes. Smart/White board	**The ability 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	**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: To understand networks failure symptoms					
12-13	**To understand**: The cause of networks failure.	**To explain:** How to recognise POST error message code as networks failure. Networks failure remedy.	PC connected to an OHP. Power Point presentation of Lectures.	**The ability to**: Recognise POST error message code as an indication of a networks problem. Rectify the networks problem	**To help student to**: Recognise POST error message code as an indication of a networks problem. Rectify the networks problem	Personal computer loaded with diagnostics packages

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
			On line lecture notes. Smart/White board	by reinsertion or replacement	by reinsertion or replacement	
	General Objective: To understand external devises failure symptoms					
14-15	**To understand**: The cause of external devises failure.	**To explain:** How to recognise POST error message code as external devises failure. To 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	**The ability to**: 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

Assessment: Give details of assignments to be used: Coursework/ Assignments 0%; Course test 20%; Projects lab activities 50%; Examination 30%

Recommended Textbooks & References:

Course: Project

Department/ Programme: All computing programmes			
Course: Project	**Course Code: COM 229**	**Credit Hours:**	**4 hours/week**
Year: 2 Semester: 2	**Pre-requisite:**	**Theoretical:** **Practical:**	**0 hours/week** **4 hours /week**
General Objectives 1. To integrate and apply the learning outcomes from the programme to the later stages of a sustained project.			

Theoretical Content				Practical Content		
Week/s	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1: Work in a team to integrate and apply the learning outcomes from the programme to the later stages of a sustained project.					
1-14				Able to: Implement a client-based project in a professional manner. Use appropriate techniques to plan the implementation of a sustained project requiring the allocation and management of multiple resources.	Provide a minimum of four hours supervision each week.	Requirements Document for a client-based project. Signed-off by the client. Project management software.
15				Able to: Make a formal presentation of a final product to clients. Obtain client acceptance of the implementation. Justify their decisions, assess the results and learn from reflecting on the process in a written report.	Observe presentation and viva students.	Presentation software and projector.

Assessment: Give details of assignments to be used: Project Plan: 20% %; Projects 80 %

Recommended Textbooks & References:

Course: Small Business Management I

Programme: Statistics (National Diploma)			
Course: Small Business Management I	**Course Code: STA 226**	**Total Hours:**	**3**
Year: 2 Semester: 4	**Pre-requisite:**	**Theoretical:** **Practical:**	**2 hour /week** **1 hour /week**

Goal: This course is designed to provide the student with the basic knowledge on the various tools used in the management of small-scale businesses.

General Objectives: On completion of this course, the diplomate will be able to:

1. Understand the nature of small-scale enterprises.
2. Understand the legal framework for small-scale enterprises.
3. Understand the role of governments in small-scale enterprises in Nigeria
4. Understand a business plan for a small-scale business enterprise.
5. Understand marketing management in a small business enterprise
6. Understand the general concept of production management
7. Know human capital needs for an enterprise

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 1 (STA 226): Understand the nature of small-scale enterprises.					
1	1.1 Define the range and scope of a small business. 1.2 Explain the importance of a small business. 1.3 Describe the problems associated with small business operations.	Explain range, scope and importance of a small scale business. Explain problems associated with small business operations.	Text Books Journals Publications	Select a small business enterprise and indicate its signs of success and failures. Use case studies based on a local organisation.	Guide students in identifying range, scope and importance of a small scale business.	Internet and relevant websites Guest speaker on small businesses
2	1.4 Describe types of businesses that could be run on a small scale. 1.5 Describe the merits and demerits of being self-employed. 1.6 Identify the starting problems and signs of failure of a small business	Explain types of businesses that could be run on small scale, their associated problems and signs of failure during operations. Explain wage employment and self employment. Explain the merits and demerits of self employment.	Text Books Journals Publications	Select a small business enterprise and indicate its signs of success and failures. Use case studies based on a local organisation.	Guide students in identifying types of businesses that could be run on small scale, their associated problems and signs of failure during operations.	Internet and relevant websites Guest speaker on small businesses
	General Objective 2 (STA 226): Understand the legal framework for small-scale enterprises.					
3	2.1 Explain the types of business organization. 2.2 Identify the legal form of business.	Explain the types of business organization Explain legal formation and regulatory status of small business. Explain environmental factors of business.	Text Books Journals Publications	Use CAMB to explain the regulatory frame work of small business. Group work to set up a small business - realistic scenarios Use of relevant documentation taken from the internet.	Guide students to identify the legal formation and regulatory status of small business.	Internet and relevant websites

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
4	2.3 Describe the environmental factors of business - law of sales, licenses, failure signs, etc. 2.4 Explain regulatory status and formation of small business.	Explain legal formation and regulatory status of small business. Explain environmental factors of business.	Text Books Journals Publications	Use CAMB to explain the regulatory frame work of small business. Group work to set up a small business - realistic scenarios Use of relevant documentation taken from the internet.	Guide students to identify the environmental factors of business.	Internet and relevant websites
	General Objective 3 (STA 226): Understand the role of governments in small-scale enterprises in Nigeria					
5	3.1 Explain government policies for small enterprises development. 3.2 Explain the effects of government policies on direct and indirect assistance to small businesses	Explain government policies for small enterprises development and effects of the policies on direct and indirect assistance to these enterprises.	Text Books Journals Publications	Identify government policies and their effects on small scale business.	Guide students to evaluate the contributions of the promoting bodies (IDC, NASA, NERFUND, NDE, NAPEP etc to growth of small business in Nigeria.	Internet and relevant websites
6	3.3 State the role of the following institutions in promoting small enterprises (a) Industrial Development Centre (IDC) (b) State Ministries of Commerce and Industries. (c) State Export Promotion Committees. (d) Centre for Management Development (CMD) (e) National Directorate of Employment (NDE) (f) NAPPEP (g) CIRD (h) NERFUND (i) NACRDB, NEPC (j) NASSI, NASME, etc	Explain the following institutions and their roles in promoting small scale enterprises. - IDC, State Ministries of Commerce, State Export Promotion Committees, CMD, NDE, NAPPEP, CIRD NERFUND NACRDB, NEPC NASSI, NASME, etc	Text Books Journals Publications	Identify and explain beneficiaries of the bodies. Promotion SME in Nigeria.	Guide students to evaluate the contributions of the promoting bodies (IDC, NASA, NERFUND, NDE, NAPEP etc to growth of small business in Nigeria.	Internet and relevant websites

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	General Objective 4 (STA 226): Understand a business plan for a small-scale business enterprise.					
7	4.1 Explain business plan. 4.2 Explain the purpose of business plan 4.3 Identify the components of a business plan from project development up to project cost.	Explain business Plan, its purpose and components from project development to project cost.	Text Books Journals Publications	Identify business plan. Identify how to plan in small business. Formulate a business plan for a particular project.	Guide students to:- Work in pairs to develop a relevant business plan. Refer to business planning information on the internet Present the plans and justify the goals	Internet and relevant websites
8	4.4 State the necessary steps in carrying out financial analysis and planning for a small business 4.5 Compare personal goal and business goals. 4.6 Identify influences of family goals in business goals	Explain steps in carrying out financial analysis and planning for a small business. Explain personal goals and business goals. Explain influences of family goals in business goals. Invite a successful entrepreneur to give a talk.	Text Books Journals Publications	Identify business plan. Identify how to plan in small business. Formulate a business plan for a particular project.	Guide students to:- Work in pairs to develop a relevant business plan. Refer to business planning information on the internet Present the plans and justify the goals	Internet and relevant websites
	General Objective 5 (STA 226): Understand marketing management in a small business enterprise					
9	5.1 Understand the basic concept of marketing. 5.2 Identify the steps in conducting market surveys to determine demand and supply for particular products. 5.3 Identify markets for specific products.	Explain basic concepts of marketing. Explain steps in conducting marketing survey to determine demand and supply for particular products. Explain how to identify markets for specific products.	Text Books Journals Publications	Identify the process of conducting a marketing survey. Identify appropriate training strategies for products produced on a small scale.	Guide students to use the internet to identify the marketing needs of small business enterprises.	Internet and relevant websites

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
10	5.4 Identify channels of distribution for a selected product or service. 5.5 Explain the promotional and sales activities for a selected product or service 5.6 Explain appropriate pricing strategies	Explain channels of distribution for a selected product or service. Explain promotional and sales activities for a selected product or service Explain appropriate pricing strategies	Text Books Journals Publications	Identify the process of conducting a marketing survey. Identify appropriate training strategies for products produced on a small scale.	Guide students to use the internet to identify the marketing needs of small business enterprises.	Internet and relevant websites
	General Objective 6 (STA 226): Understand the general concept of production management					
11	6.1 Explain the basic concepts of production 6.2 Explain choice of appropriate technology 6.3 Identify types and sources of machinery and equipment. 6.4 Explain the installed capacity. 6.5 Explain the utilized capacity.	Explain the basic concepts of production Explain choice of appropriate technology Explain types and sources of machinery and equipment, their installed and utilized capacity.	Text Books Journals Publications Sample business	Identify appropriate technology for different types of SME. Identify sources of machinery and material from the internet. Identify appropriate locations and their problems for SMES	Guide students to prepare a case study on the location of an industry and factory layout Oversee group work and guide reference to relevant web sites	Internet and relevant websites
12	6.6 Identify sources of raw materials. 6.7 Describe factory location and factors in the selection of site. 6.8 Describe factory layout.	Explain sources of raw materials. Explain factory location, its layout and safety measures. Explain Plant and machinery maintenance. Explain plan and scheduling.	Text Books Journals Publications Sample business	Identify appropriate technology for different types of SME. Identify sources of machinery and material from the internet. Identify appropriate	Guide students to prepare a case study on the location of an industry and factory layout Oversee group work and guide reference to relevant web sites	Internet and relevant websites

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
	6.9 Explain plant and machinery maintenance. 6.10 Explain Plan and scheduling.			locations and their problems for SMES		
13	6.11 Explain quality control issues. 6.12 Explain factory safety measures. 6.13 Identify problems of production in the Nigerian situation. 6.14 Explain how to cope with production problems in Nigeria.	Explain quality control. Explain problems of production in the Nigerian situation and how to cope with them. Organise a field trip to a successful small business establishment.	Text Books Journals Publications Sample business	Identify appropriate technology for different types of SME. Identify sources of machinery and material from the internet. Identify appropriate locations and their problems for SMES	Guide students to prepare a case study on the location of an industry and factory layout Oversee group work and guide reference to relevant web sites	Internet and relevant websites
	General Objective 7 (STA 226): Know human capital needs for an enterprise					
14	7.1 Identify human capital needs for an enterprise. 7.2 Explain recruitment procedures. 7.3 Explain need for training of workers. 7.4 Explain how to motivate workers.	Explain human capital management and its needs for small business enterprises. Explain recruitment procedures	Text Books Journals Publications Cardboard	Identify the recruitment compensation and training procedures of workers in SMES. Identify problems of human capital management and how to solve them in SMEs	Guide students to prepare organizational charts for SME and how to forecast their employment needs.	Internet and relevant websites

Theoretical Content				Practical Content		
Week	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**	**Specific Learning Outcomes**	**Teacher's activities**	**Resources**
15	7.5 Explain how to compensate workers. 7.6 Explain organization of work force, organizational chart. 7.7 Explain problems of human capital management in small business enterprises. 7.8 Explain how to cope with the problems of human capital management.	Explain need for training of workers. Explain how to motivate. and compensate workers Explain organization of work force. Guide students to prepare organizational, chart for a small business enterprise. Explain problems of human capital management in small business enterprises and how to cope with them.	Text Books Journals Publications Cardboard	Identify the recruitment compensation and training procedures of workers in SMES. Identify problems of human capital management and how to solve them in SMEs	Guide students to prepare organizational charts for SME and how to forecast their employment needs.	Internet and relevant websites

Assessment: Give details of assignments to be used: Coursework/ Assignments %; Course test %; Practical %; Project %; Examination %

Type of Assessment	Purpose and Nature of Assessment (STA 226)	Weighting (%)
Examination	Final Examination (written) to assess knowledge and understanding	0
Test	At least 1 progress test for feed back.	25
Practical / Project	Project with group (25%) and individual (50%) components to be assessed by the teacher	75
Total		100

Recommended Textbooks & References: