

MINISTRY OF EDUCATION

**DIPLOMA IN
INFORMATION COMMUNICATION
TECHNOLOGY**

KENYA INSTITUTE OF EDUCATION

MARCH 2008

TABLE OF CONTENT

INTRODUCTION	i
SYLLABUS REQUIREMENTS	iv
MODULE 1	
7.1.1. INTRODUCTION TO INFORMATION COMMUNICATION TECHNOLOGY AND ETHICS (150 HOURS)	1
7.1.1.1T INTRODUCTION TO INFORMATION COMMUNICATION TECHNOLOGY (ICT)	4
7.1.1.2T INTRODUCTION TO COMPUTERS	5
7.1.1.3T COMPUTER HARDWARE AND ORGANISATION	5
7.1.1.4T COMPUTER SOFTWARE	6
7.1.1.5T HARDWARE, SOFTWARE SELECTION AND ACQUISITION.....	7
7.1.1.6T COMPUTER PERSONNEL.....	7
7.1.1.7T COMPUTER SAFETY AND ERGONOMICS.....	8
7.1.1.8T INTRODUCTION TO COMMUNICATION NETWORK.....	8
7.1.1.9T ICT ETHICS AND LEGISLATIONS.....	9
7.1.1.10T LIFE SKILLS.....	10
7.1.1.11T CONFLICT MANAGEMENT	10
7.1.1.12T SOCIAL RESPONSIBILITY IN INFORMATION COMMUNICATION TECHNOLOGY (ICT)	11
7.1.1.13T EMERGING TRENDS IN ICT AND ETHICS	11
8.1.2. COMPUTER APPLICATION I (HOURS 140)	13
8.1.2.1T INTRODUCTION TO COMPUTER APPLICATIONS.....	18
8.1.2.2T INTRODUCTION TO ENVIRONMENT	18
8.1.2.3T WORD PROCESSING	19
8.1.2.4T SPREADSHEET	21
8.1.2.5T DATABASE.....	24
8.1.2.6T DESKTOP PUBLISHING.....	26
8.1.2.7T FINANCIAL APPLICATIONS	27
8.1.2.8T COMPUTER AIDED DRAWING	28
8.1.2.9T APPLICATION AREAS	29
8.1.2.10T APPLICATION TRENDS	30
9.1.3. COMMUNICATION SKILLS (110 HOURS)	32
9.1.3.1T MEANING OF COMMUNICATION.....	34

9.1.3.2T	THEORY AND PROCESS.....	34
9.1.3.3T	PRINCIPLES OF COMMUNICATION	35
9.1.3.4T	THE SYNTAX AND SEMANTICS.....	35
9.1.3.5T	SUMMARY	36
9.1.3.6T	BUSINESS CORRESPONDENCE.....	36
9.1.3.7T	MEETINGS (Group Decision and Managerial Decisions)	37
9.1.3.8T	REPORTS	37
9.1.3.9T	ORAL COMMUNICATION AND NON-VERBAL COMMUNICATION	38
9.1.3.10T	VISUAL COMMUNICATION	39
10.1.4.	STRUCTURED PROGRAMMING (200 HOURS)	40
10.1.4.1T	INTRODUCTION TO STRUCTURED PROGRAMMING	41
10.1.4.2T	PROGRAM DEVELOPMENT AND DESIGN.....	42
10.1.4.3T	PROGRAM STRUCTURE.....	43
10.1.4.4T	PROGRAM WRITING	44
10.1.4.5T	CONTROL STRUCTURES.....	45
10.1.4.6T	DATA STRUCTURES	45
10.1.4.7T	SUB PROGRAMS	47
10.1.4.8T	FILE HANDLING	48
10.1.4.9T	PROGRAM DOCUMENTATION.....	48
10.1.4.10T	EMERGING TRENDS OF STRUCTURED PROGRAMMING.....	49
11.1.5.	COMPUTATIONAL MATHEMATICS (130 HOURS)	50
11.1.5.1T	INTRODUCTION TO MODELLING	52
11.1.5.2T	NUMERICAL ANALYSIS	52
11.1.5.3T	NUMBER SYSTEMS AND BINARY ARITHMETIC	54
10.1.6.	BINARY CODES	56
11.1.6.1T	LOGIC GATES AND BOOLEAN ALGEBRA (7 HOURS).....	57
11.1.6.2T	ALGEBRA.....	59
11.1.6.3T	DISCRETE COUNTING	60
11.1.6.4T	GRAPHS AND FUNCTION	61
11.1.6.5T	ELEMENTS OF PROBABILITY.....	62
11.1.6.6T	DATA COLLECTION AND PRESENTATION.....	63
11.1.6.7T	MEASURES OF CENTRAL TENDENCY	63
11.1.6.8T	MEASURES OF DISPERSION	64
12.1.7.	OPERATING SYSTEMS (100 HOURS).....	65
12.1.7.1T	INTRODUCTION OPERATING SYSTEMS.....	66
12.1.7.2T	PROCESS MANAGEMENT	67

12.1.7.3T	MEMORY MANAGEMENT	68
12.1.7.4T	DEVICE I/O MANAGEMENT	69
13.1.7.5T	FILE MANAGEMENT	71

MODULE 2

15.2.1. RESEARCH PROJECT	85	
15.2.1.1T	INTRODUCTION TO PROJECT WORK	86
15.2.1.2T	PROJECT PROPOSAL	86
15.2.1.3T	METHODOLOGODIES	87
15.2.1.4T	ANALYSIS	88
15.2.1.5T	PRESENTATION	88
16.2.2. SYSTEMS ANALYSIS AND DESIGN – (160 HOURS)	90	
16.2.2.1T	INTRODUCTION TO SYSTEMS ANALYSIS AND DESIGN.....	92
16.2.2.2T	SYSTEMS THEORY/CONCEPT	93
16.2.2.3T	SYSTEMS DEVELOPMENT LIFE CYCLE (SDLC).....	94
16.2.2.4T	PROBLEM DEFINITION.....	94
16.2.2.5T	FEASIBILITY STUDY	95
16.2.2.6T	SYSTEMS ANALYSIS	96
16.2.2.7T	SYSTEMS DESIGN AND DEVELOPMENT	97
16.2.2.8T	SYSTEM IMPLEMENTATION	98
16.2.2.9T	SYSTEM MAINTENANCE AND REVIEW	99
16.2.2.10T	SYSTEM DOCUMENTATION.....	99
16.2.2.11T	SYSTEM ACQUISITION.....	100
16.2.2.12T	ICT PROJECT MANAGEMENT	100
16.2.2.13T	EMERGING TRENDS IN SAD	100
17.2.3. OBJECT ORIENTED PROGRAMMING (90 HOURS)	102	
17.2.3.1T	INTRODUCTION TO OBJECT ORIENTED PROGRAMMING	104
17.2.3.2T	OBJECT ORIENTED PROGRAMMING CONCEPTS.....	105
17.2.3.3T	LANGUAGE STRUCTURES OF OBJECT ORIENTED PROGRAMMING (OOP)	105
17.2.3.4T	ESSENCE OF OBJECTS AND CLASSES.....	107
17.2.3.5T	INHERITANCE.....	108
17.2.3.6T	POLYMORPHISM.....	109
17.2.3.7T	CONSTRUCTORS AND DESTRUCTORS.....	109
17.2.3.8T	OPERATOR OVERLOADING	110
17.2.3.9T	FILE ORGANISATION.....	111

17.2.3.10T	EMERGING TRENDS IN OBJECT ORIENTED PROGRAMMING	112
18.2.4.	VISUAL PROGRAMMING (190 HOURS)	113
18.2.4.1T	INTRODUCTION TO VISUAL PROGRAMMING LANGUAGES	115
18.2.4.2T	VISUAL ENVIRONMENT	115
18.2.4.3T	PROGRAM STRUCTURE	116
18.2.4.4T	PROGRAM WRITING	117
18.2.4.5T	CONTROL STRUCTURES	117
18.2.4.6T	ERROR HANDLING	118
18.2.4.7T	SUB-PROGRAMS	119
18.2.4.8T	DATA STRUCTURES	119
18.2.4.9T	LINKING TO DATABASES	120
18.2.4.10T	EMERGING TRENDS IN VISUAL PROGRAMMING	121
19.2.5.	DATABASE MANAGEMENT SYSTEM (100 HOURS)	122
19.2.5.1T	INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS.....	125
19.2.5.2T	DATABASE ORGANISATION.....	125
19.2.5.3T	PRINCIPLES AND TECHNIQUES OF DATABASE DESIGN.....	126
19.2.5.4T	RELATIONAL DATABASE SYSTEM	126
19.2.5.5T	ENTITY RELATIONSHIP	127
19.2.5.6T	NORMALIZATION	127
19.2.5.7T	QUERYING A DATABASE.....	128
19.2.5.8T	FUNCTION OF DATABASE MANAGEMENT SYSTEMS	128
19.2.5.9T	EMERGING TRENDS	129

MODULE 3

20.3.1.	DATA COMMUNICATION AND NETWORKING (150 HOURS)	136
21.3.1.1T	DATA COMMUNICATION AND NETWORKING.....	139
21.3.1.2T	NETWORK MEDIA	140
21.3.1.3T	DATA COMMUNICATION.....	140
21.3.1.4T	NETWORK CONNECTIONS AND PROTOCOLS	141
21.3.1.5T	LOCAL AREA NETWORK	142
21.3.1.6T	WIDE AREA NETWORK	142
21.3.1.7T	ETHERNET TECHNOLOGY	142
21.3.1.8T	NETWORK TROUBLE SHOOTING	143
21.3.1.9T	NET WORK SECURITY	143
21.3.1.10T	NETWORK DESIGN	144
21.3.1.11T	TCP/IP PROTOCOLS	145
21.3.1.12T	COMMUNICATION SOFTWARE	145

21.3.1.13T	INTERNET	146
21.3.1.14T	EMERGING TRENDS	147
22.3.2.	MANAGEMENT INFORMATION SYSTEMS (100 HOURS).....	149
22.3.2.1T	INTRODUCTION TO MANAGEMENT INFORMATION SYSTEM (MIS)....	153
22.3.2.2T	MANAGEMENT OF INFORMATION SYSTEM RESOURCES	154
22.3.2.3T	INFORMATION SYSTEM PLANNING	154
22.3.2.4T	INFORMATION SYSTEM PROJECT MANAGEMENT	155
22.3.2.5T	INFORMATION SYSTEM ACQUISITION.....	155
22.3.2.6T	ROLE OF INFORMATION SYSTEM (IS) IN ORGANIZATION.....	156
22.3.2.7T	INFORMATION SYSTEMS MAINTENANCE	156
22.3.2.8T	ROLE OF INFORMATION SYSTEM (IS) IN ORGANIZATION CHANGE ..	157
22.3.2.9T	INFORMATION SYSTEM ETHICS	157
22.3.2.10T	EMERGING TRENDS IN MANAGEMENT INFORMATION SYSTEM (MIS) ..	157
24.3.3.	PRINCIPLES AND PRACTICE OF MANAGEMENT (144 HRS).....	159
23.3.3.1T	INTRODUCTION TO MANAGEMENT	161
23.3.3.2T	THE FUNCTION OF PLANNING	162
23.3.3.3T	THE FUNCTION OF ORGANIZATION.....	163
23.3.3.4T	THE FUNCTION OF STAFFING	165
23.3.3.5T	THE FUNCTION OF DIRECTING/LEADERSHIP	166
23.3.3.6T	THE CONTROLLING FUNCTION.....	167
23.3.3.7T	PERSONNEL MANAGEMENT.....	168
23.3.3.8T	PURCHASING AND SUPPLIES MANAGEMENT	169
23.3.3.9T	MARKETING MANAGEMENT.....	170
24.3.4.	QUANTITATIVE METHODS.....	173
24.3.4.1T	DATA COLLECTION AND PRESENTATION	175
24.3.4.2T	MEASURES OF CENTRAL TENDENCY	176
24.3.4.3T	MEASURES OF DISPERSION	176
24.3.4.4T	CORRELATION AND REGRESSION.....	177
24.3.4.5T	TIME SERIES.....	178
24.3.4.6T	INDEX NUMBERS.....	179
24.3.4.7T	PROBABILITY DISTRIBUTIONS	180
24.3.4.8T	NETWORK PLANNING.....	180
24.3.4.9T	LINEAR PROGRAMMING.....	182
24.3.4.10T	ESTIMATION AND TEST OF HYPOTHESIS	183
24.3.4.11T	DECISION	184
24.3.4.12T	SIMULATION.....	184

24.3.4.13T	SAMPLING	185
24.3.4.14T	FINANCIAL MATHEMATICS	186
25.3.5.	INTERNET BASED PROGRAMMING-(110 HOURS).....	188
25.3.5.1T	INTRODUCTION TO INTERNET BASED PROGRAMMING	190
25.3.5.2T	WEB PROGRAMMING	190
25.3.5.3T	HTML CODING.....	191
25.3.5.4T	WEB AUTHORIZING AND DESIGN TOOLS.....	193
25.3.5.5T	JAVA SCRIPT AND ACTIVE SERVER PAGES	194
25.3.5.6T	WEB SECURITY	194
25.3.5.7T	EMERGING TRENDS IN INTERNET BASED PROGRAMMING.....	195
25.3.6.	BUSINESS PLAN.....	196
25.3.6.1T	INTRODUCTION TO BUSINESS PLAN	199
25.3.6.2T	BUSINESS DESCRIPTION	199
25.3.6.3T	MARKETING PLAN	200
25.3.6.4T	ORGANISATION AND MANAGEMENT PLAN	201
25.3.6.5T	OPERATIONAL AND PRODUCTION PLAN	201
25.3.6.6T	FINANCIAL PLAN	202
25.3.6.7T	PRESENTATION	203
25.3.6.8T	EMERGING TRENDS AND ISSUES.....	203

INTRODUCTION

1.0 NATIONAL GOALS OF EDUCATION

Education in Kenya should:

1. Foster nationalism, patriotism and promote national unity.

Kenya's people belong to different ethnic groups, races and religions, but these differences need not divide them. They must be able to live and interact as Kenyans. It is a paramount duty of education to help the youth acquire this sense of nationhood by removing conflicts and by promoting positive attitudes of mutual respect which enable them to live together in harmony and foster patriotism in order to make a positive contribution to the life of the nation.

2. Promote the social, economic, technological and industrial needs for national development.

Education should prepare the youth of the country to play an effective and productive role in the life of the nation.

(a) Social Needs

Education in Kenya must prepare children for the changes in attitudes and relationships which are necessary for the smooth process of a rapidly developing modern economy. There is bound to be a silent social revolution following in the wake of rapid modernization. Education should assist our youth to adapt to this change.

(b) Economic Needs

Education in Kenya should produce citizens with skills, knowledge, expertise and personal qualities that are required to support a growing economy. Kenya is building up a modern and independent economy which is in need of adequate domestic manpower.

(c) Technological and Industrial Needs

Education in Kenya should provide the learners with the necessary skills and attitudes for industrial development. Kenya recognizes the rapid industrial and technological changes taking place especially in the developed world. We can only be part of this development if our education system deliberately focused on knowledge, skills and attitudes that will prepare the youth for these changing global trends.

3. Promote individual development and self-fulfilment.

Education should provide opportunities for the fullest development of individual talents and personality. It should help children to develop their

potential interests and abilities. A vital aspect of individual development is character building.

4. Promote sound moral and religious values

Education should provide for the development of knowledge, skills and attitudes that will enhance acquisition of sound moral values and help children to grow up into self-disciplined, self-reliant and integrated citizens.

5. Promote social equality and responsibility

Education should promote social equality and foster a sense of social responsibility within an education system which provides equal education opportunities for all. It should give all children varied and challenging opportunities for collective activities and corporate social service irrespective of gender, ability or geographical environment.

6. Promote respect for and development of Kenya's rich and varied cultures

Education should instil in the youth of Kenya an understanding of past and present cultures and their valid place in contemporary society. The children should be able to blend the best of traditional values with the changed requirements that must follow rapid development in order to build a stable and modern society.

7. Promote international consciousness and foster positive attitudes towards other nations

Kenya is part of the international community. It is part of the complicated and interdependent network of peoples and nations. Education should therefore lead the youth of the country to accept membership in this international community with all the obligations and responsibilities, rights and benefits that this membership entails.

8. Promote positive attitudes towards good health and environmental protection

Education should inculcate in the youth the value for good health in order to avoid indulging in activities that will lead to physical or mental ill health. It should foster positive attitudes towards environmental development and conservation. It should lead the youth to appreciate the need for a healthy environment.

2.0 NATIONAL AIMS FOR TECHNICAL TRAINING PROGRAMMES

The aims of the technical training at both post primary and post secondary levels should be :-

- (i) to provide training opportunities for the increasing number of school leavers to enable them to be self-supporting;
- (ii) to develop practical skills and attitudes which will lead to income generating activities in the urban and rural areas through self-employment;
- (iii) to provide practical education and training skills which are responsive and relevant to Kenya's agricultural, industrial, commercial and economic needs;
- (iv) to provide the technical knowledge and vocational skills necessary to enhance the pace of this nation's development;
- (v) to encourage self-employment while at the same time producing skilled artisans, technicians and technologists for both formal and informal sectors at the ratio of 1 technologist to 5 technicians to 30 craftsmen/artisans (1:5:30).

3.0 OBJECTIVES OF THE TECHNICIAN PROGRAMMES

The general objectives of the technician training programmes are:-

- (a) to develop skills which will be responsive and relevant to the country's human resources required at the middle level;
- (b) to prepare the trainees so that they can enter the world of work with confidence for either salaried employment or self-employment;
- (c) to impart adequate skills which will enable the trainee to operate either as craftsman or perform middle supervisory function.

4.0 INTRODUCTION TO THE COURSE

The course Diploma in Information Communication Technology (DICT) has been developed to cater for needs of those intending to specialize in the area of ICT. In addition, the course lays a solid foundation that caters for the learner's needs for further studies and life-long learning in this study area. It imparts the necessary knowledge and skills to enable the learner to fit into the competitive global job market.

Computer-based technologies are dynamic and therefore this syllabus encourages the learner to be versed with the current trends in ICT and other related emerging issues. This is important so that he/she remain more informed

This course is designed to equip the trainee with knowledge, skills and attitudes to perform system operations, system analysis, design and development, besides performing network system and support duties.

5.0 GENERAL OBJECTIVES OF THE COURSE

By the end of this course, the trainee should be able to:-

- (a) perform systems operations duties
- (b) perform system analysis, design and development duties
- (c) perform network and system support duties

SYLLABUS REQUIREMENTS

6.0 GENERAL REGULATIONS

6.1.0 APPROVAL OF THE TRAINING INSTITUTIONS

Institutions offering this course should be recognized and approved by the Ministry responsible for Training.

6.2.0 DURATION OF THE COURSE

5.2.1 The course is designed to have duration of 2970 hours. 2310 hours will be spent in the institution while 660 hours will be used for industrial attachment as outlined below:

	Institution Time (Hours)	Industrial Attachment	Total Time (Hour)
Module I	770	330	1100
Module II	770	330	1100
Module III	770	-	770
Total Hours	2310	660	2970

5.2.2 The pattern of attendance is left at the discretion of the institution offering the course (i.e. full-time, part-time, sandwich, semester, etc.)

6.3.0 ENTRY REQUIREMENTS

5.3.1 A trainee entering this course should have any of the following minimum requirements:

- a) Passed Kenya Certificate of secondary Education (KCSE) with a mean grade of C (C Plain)

OR

- b) Passed Craft in Certificate in Computer Studies

OR

- c) Equivalent qualification as approved by Kenya National Examinations Council

6.4.0 EXAMINATIONS

The Kenya National Examinations Council will offer external examinations. Internal examinations will be offered by the institutions as coursework/continuous assessment.

6.4.1 COURSE WORK / CONTINUOUS ASSESSMENT

Course work/continuous assessment will be prepared and marked by the institutions. Institutions will issue statements of results.

6.4.2 EXTERNAL EXAMINATIONS

The Kenya National Examinations Council will offer external examinations for the Diploma in Information Communication Technology in various modules, i.e. Module I, II and III.

6.4.3 EXAMINABLE SUBJECTS

Module I	DURATION
1. Introduction to ICT and ethics	3 Hours
2. Computer application I	3 Hours
3. Communication Skills	3 Hours
4. Structured programming	3 Hours
5. Computational mathematics	3 Hours
6. Operating systems	3 Hours
7. Entrepreneurship Education	3 Hours

Module II	DURATION
1. Research Project	3 Hours
2. System analysis and design	3 Hours
3. Object orientated programming	3 Hours
4. Data Base Management Systems	3 Hours
5. Computer Applications II	3 Hours
6. Visual Programming	3 Hours

Module III

1. Data Communication and Networking 3 Hours
2. Management Information Systems. 3 Hours
3. Principles and Practices of Management 3 Hours
4. Quantitative Techniques. 3 Hours
5. Internet Based programming 3 Hours
6. Business Plan N/A

6.5 ELIGIBILITY FOR ENTRY TO EXAMINATION

Candidates for the examinations in any module must at the time of entry to the examination have completed the course at an institution recognized and approved for the course and have completed 75% attendance of the course time.

6.6 ATTENDANCE AND COURSE WORK REQUIREMENTS

The candidates are expected to be attached to an institution approved for the courses for the theoretical and practical studies.

6.7 INDUSTRIAL ATTACHMENT

At the end of Module I and II courses, the trainee must show evidence of having covered a minimum of 330 hours of each module for an industrial attachment. During this period each trainee will be expected to have been attached to an organization practising the relevant trade where he/she will be expected to familiarize himself/herself with all or most aspects of the trade. The training institutions in collaboration with the organisations where trainees are attached should supervise the trainee during the industrial attachment

Module III course does not require industrial attachment.

6.8 PROJECT WORK

A project in this context means a piece of work carried out by an individual trainee. It may be practical, mathematical, evaluative, descriptive or research based project. The project is to have well defined objectives so that trainee/trainees have something definite to aim at, without inhibiting their initiatives.

6.8.1 AIMS OF PROJECT WORK

The aims of project work are to give the trainee(s)

- a) experience in an extended piece of practical work;
- b) an opportunity to develop and implement their own ideas;
- c) experience of working with the supervisor and peers in carrying out the

ideas of the supervisor;

- d) experience in writing a technical report and in keeping records of work as it proceeds.

6.8.2 PROJECT SELECTION

The trainee will carry out two projects one of which will be related to the trade and will be assessed by the Kenya National Examinations Council, while the other one will be an entrepreneurship project which will be submitted to the Kenya National Examinations Council for verification.

The Entrepreneurship project will be carried out at Module I and the trade project at Module III.

- 6.8.2.1 The project may be decided upon by the institution or sponsors and the lists of the projects should be submitted to the Kenya National Examinations Council by the beginning of Module III.
- 6.8.2.2 Each project must be supervised by a staff member to ensure that the candidate is receiving adequate guidance. A minimum of 22 hours would be spent on orientation to project methodology.
- 6.8.2.3 Projects will be submitted to the Kenya National Examinations Council at least two weeks before the beginning of the final Examinations.
- 6.8.2.4 Assessment of the project work should be carried out by the internal examiner from the training institution and an external examiner appointed by the Kenya National Examinations Council.

6.9 EXAMINATION RESULTS

- 6.9.1 For the award of a certificate, every candidate must be assessed through continuous assessment, theoretical and practical tests as outlined in 5.4.0.
- 6.9.2 Results of the examination as a whole will be issued in four classes and for the individual papers will be in eight grades. Each candidate will receive all records of performance, giving the result in terms of class and grade.
- 6.9.3 The relationship between classes and grades is:

Pass with distinction	Grade 1 and 2
Pass with credit	Grade 3 and 4
Pass	Grade 5 and 6
Referred	Grade 7
Fail	Grade 8

6.9.4 Candidates do not have to take all the papers in a module at the same sitting.

6.9.5 Candidates who fail any paper in a particular module will be **REFERRED** in the failed paper and will have to pass the failed paper before being issued with Diploma in **INFORMATION COMMUNICATION TECHNOLOGY**.

6.10 AWARD OF CERTIFICATE

The Kenya National Examinations Council will issue the candidates with result slips for each module. On successful completion of Module I, II and III, the candidate will be issued with a Diploma in Information Technology

6.11 DIPLOMA CERTIFICATE

After successful completion of the three modules, a candidate will be eligible to be awarded a Diploma certificate in Information Communication Technology by the Kenya National Examinations Council.

6.12 GENERAL REGULATIONS

In the event of any inconsistency arising between the regulations as set in this syllabus and the General Regulations published by the Kenya National Examinations Council, the General Regulations of the Council shall prevail.

6.13 A LIST OF NECESSARY EQUIPMENT AND TOOLS NEEDED BEFORE AN INSTITUTION CAN START THIS COURSE;

6.13.1 Computer Laboratory

- Computer laboratory meeting the required standards of furniture and space
- Computers set on a LAN
- Internet connectivity
- Appropriate software required in this syllabus
- A ratio of 3 students per computer

6.13.2 A Workshop where repairs and demonstration can be held
Peripherals

-

MODULE 1

By the end of this module unit, the trainee should be able to utilise computer applications, apply communication skills, apply programming techniques to solve problems, solve mathematical computation, appreciate the role of an OS and apply Entrepreneurship skills in day to day activities

Topics

1. Introduction to ICT and ethics
2. Computer application I
3. Communication Skills
4. Structured programming
5. Computational mathematics
6. Operating systems
7. Entrepreneurship Education

7.1.1. INTRODUCTION TO INFORMATION COMMUNICATION TECHNOLOGY AND ETHICS (150 HOURS)

7.1.1.01: INTRODUCTION

This module unit is intended to introduce the trainee to Information Communication Technology, equipping him/her with the necessary knowledge, skills and attitude to enable him/her professionally work with ICT facilities

7.1.1.02: GENERAL OBJECTIVES

By the end of this module unit, the trainee should be able to:-

- a) appreciate the role of ICT in contemporary society
- b) appreciate the ethical and legal implication in the use of ICT
- c) appreciate and uphold professional and life skills in the society

7.1.1.03: COURSE SUMMARY AND TIME ALLOCATION -150 HOURS

CODE	TOPIC	SUB-TOPIC	TIME		TOTAL
			T	P	
7.1.1.1	INTRODUCTION TO ICT	<ul style="list-style-type: none"> • meaning of ICT • uses of ICT in organizations • ICT equipment / facilities • impact of ICT in contemporary society 	4	0	4
7.1.1.2	INTRODUCTION TO COMPUTERS	<ul style="list-style-type: none"> • meaning and importance of a computer • historical evolution of computers • classification of computers • components of a computer • uses of computers <ul style="list-style-type: none"> - benefits - challenges 	4	2	6
7.1.1.3	COMPUTER HARDWARE AND ORGANISATION	<ul style="list-style-type: none"> • computer hardware devices <ul style="list-style-type: none"> - central processing unit - input devices - output devices - storage devices - bus system 	12	4	16
7.1.1.4	COMPUTER SOFTWARE	<ul style="list-style-type: none"> • meaning and importance of computer software • classification of computer software • software Installation 	2	8	10
7.1.1.5	HARDWARE -SOFTWARE SELECTION AND ACQUISITION	<ul style="list-style-type: none"> • meaning and importance • factors considered • procedures • methods 	4		4
7.1.1.6	COMPUTER PERSONNEL	<ul style="list-style-type: none"> • roles and skills of computer personnel 	2		2
7.1.1.7	COMPUTER SAFETY AND ERGONOMICS	<ul style="list-style-type: none"> • meaning and importance • the safety of computer system • ergonomics 	4	2	6

CODE	TOPIC	SUB-TOPIC	TIME		TOTAL
			T	P	
7.1.1.8	INTRODUCTION TO COMMUNICATION NETWORKS	<ul style="list-style-type: none"> • meaning and importance of communication network • types of communication tools/technologies • types of networks 	4	2	6
7.1.1.9	ICT ETHICS AND LEGISLATIONS	<ul style="list-style-type: none"> • meaning and importance of ethics for ICT • ethical challenges in ICT <ul style="list-style-type: none"> - types - reasons - control measures • meaning and importance of ICT legislations • sources of ICT legislation • ICT legislations and policies issues • enforcement measures for ICT legislation and policies 	12		12
7.1.1.10	LIFE SKILLS	<ul style="list-style-type: none"> • meaning and importance of life skills • type of Life skills <ul style="list-style-type: none"> - time management - self awareness - self esteem - emotions and stress management - people skills - others 	6	2	8
7.1.1.11	CONFLICT MANAGEMENT	<ul style="list-style-type: none"> • meaning of conflict • importance of managing conflicts • types of conflicts • causes of conflicts • techniques or approaches to conflict management 	6		6

CODE	TOPIC	SUB-TOPIC	TIME		TOTAL
			T	P	
7.1.1.12	SOCIAL RE-SPONSIBILITY IN ICT	<ul style="list-style-type: none"> • meaning and importance of social responsibility • social responsibility s in ICT • environmental protection • confidentiality and privacy • others • challenges of social responsibility in ICT 	4	2	6
7.1.1.13	EMERGING TRENDS IN ICT AND ETHICS	<ul style="list-style-type: none"> • emerging trends in ICT and ethics • challenges of emerging trends in ICT and ethics • coping with the challenges of emerging trends in ICT and ethics 	4		4

7.1.1.1T INTRODUCTION TO INFORMATION COMMUNICATION TECHNOLOGY (ICT)

THEORY

7.1.1.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning of ICT
- b) explain the uses of ICT
- c) describe ICT equipment / facilities found in organisations
- d) explain the impact of ICT in contemporary society

CONTENT

7.1.1.1.T1 Meaning of ICT

7.1.1.1.T2 Uses of ICT

7.1.1.1.T3 ICT equipment / facilities found in organizations

- computers
- photocopiers
- telephone / fax machines
- printers
- others

7.1.1.1.T4 Impact of ICT in contemporary society

7.1.1.2T INTRODUCTION TO COMPUTERS

7.1.1.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning and importance of a computer
- b) describe the components of a computer
- c) describe computer hardware
- d) describe computer software
- e) explain the historical evolution of computers
- f) describe the classification of computers
- g) explain the benefits and challenges of computers

CONTENT

7.1.1.2.T1 Meaning and importance of a computer

7.1.1.2.T2 Historical evolution of computers

7.1.1.2.T3 Computer components

- computer hardware
- computer Software

7.1.1.2.T4 Classification of computers

- super computers
- mainframe computers
- micro computers
- mini computers

7.1.1.2.T5 Benefits and challenges in the use of computers

PRACTICE

7.1.1.2.P0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) identify various components of a computer
- b) assemble computer components for use on a standalone computer

CONTENT

7.1.1.2.P1 Trainee to physically identify the components of a computer

7.1.1.2.P2 Trainee to set up a computer system for use as a standalone computer

7.1.1.3T COMPUTER HARDWARE AND ORGANISATION

THEORY

7.1.1.3.T0 Specific Objectives

By the of this topic, the trainee should be able to:-

- a) describe computer hardware devices

7.1.1.3.T1 Computer hardware devices

- input devices
- output devices
- central processing unit
- storage devices
- bus system
- others

PRACTICE

7.1.1.3.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:-

- a) identify various computer hardware devices
b) disassemble and correctly reassemble a computer

CONTENT

7.1.1.3.P1 Trainee to identify various computer hardware devices

7.1.1.3.P2 Trainee disassembles and correctly re-assembles a computer

7.1.1.4T **COMPUTER SOFTWARE**

THEORY

7.1.1.4.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:-

- a) explain the meaning and importance of computer software
b) describe the classification of computer software

CONTENT

7.1.1.4.T1 Meaning and importance of computer software

7.1.1.4.T2 Classification of computer software

- system software
 - operating systems
 - housekeeping software
- application software

PRACTICE

7.1.1.4.P0 **Specific Objective**

By the end of this topic, the trainee should be able to:-

- a) correctly install and configure computer software

CONTENT

- 7.1.1.4.P1** Trainee to correctly install and configure computer software
- operating system – Windows, Linux, Unix, others
 - application software – MS office, open office, others
 - housekeeping software – anti-virus software, others

7.1.1.5T **HARDWARE, SOFTWARE SELECTION AND ACQUISITION**

THEORY

7.1.1.5.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of hardware, software selection and acquisition
- b) describe factors considered in selection and acquisition
- c) highlight procedure of selection and acquisition
- d) describe methods of selection and acquisition

CONTENT

- 7.1.1.5.T1** Meaning and importance of hardware and software selection and acquisition
- 7.1.1.5.T2** Factors considered in hardware and software selection and acquisition
- 7.1.1.5.T3** Procedure of selection and acquisition of hardware and software
- 7.1.1.5.T4** Methods of hardware and software acquisition and selection

7.1.1.6T **COMPUTER PERSONNEL**

THEORY

7.1.1.6.T0 **Specific Objective**

By the end of this topic, the trainee should be able to:-

- a) describe the roles and skill requirements expected of various computer personnel

CONTENT

- 7.1.1.6.T1** Roles and skills requirements of various computer personnel
- computer programmers
 - system analysts
 - system designers
 - others

7.1.1.7T COMPUTER SAFETY AND ERGONOMICS

THEORY

7.1.1.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) describe the meaning and importance of computer safety and ergonomics
- b) describe computer safety
- c) explain computer ergonomics

CONTENT

7.1.1.7.T1 Meaning and importance of computer safety and ergonomics

7.1.1.7.T2 Computer safety

- hardware safety
- software safety
- data safety

7.1.1.7.T3 Computer ergonomic

PRACTICE

7.1.1.7.P0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) demonstrate ergonomic use of computers

CONTENT

7.1.1.7.P1 Trainee to demonstrate ergonomic use of computers

7.1.1.8T INTRODUCTION TO COMMUNICATION NETWORK

THEORY

7.1.1.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning of a communication network
- b) explain the uses and benefits of communication network
- c) describe telecommunication technologies
- d) describe the types of networks
- e) describe network topologies

CONTENT

7.1.1.8.T1 Meaning of a communication network

- 7.1.1.8.T2 Uses and benefits of communication networks
- 7.1.1.8.T3 Telecommunication technology
- 7.1.1.8.T4 Types of network
- 7.1.1.8.T5 Network topologies

7.1.1.9T ICT ETHICS AND LEGISLATIONS

THEORY

7.1.1.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning and importance of ICT ethics
- b) describe unethical behaviour in ICT
- c) explain reasons for unethical behaviour in ICT
- d) explain the measures for controlling unethical behaviour in ICT
- e) explain the sources of ICT legislations
- f) describe ICT legislations and policies
- g) explain enforcement measures for ICT legislation and policies

CONTENT

- 7.1.1.9.T1 Meaning and importance of ICT ethics
- 7.1.1.9.T2 Unethical behaviour in ICT
 - software piracy
 - unauthorized access
 - others
- 7.1.1.9.T3 Reasons for unethical behaviour in ICT
- 7.1.1.9.T4 Measures for controlling unethical behaviour in ICT
- 7.1.1.9.T5 Sources of ICT legislations
- 7.1.1.9.T6 ICT legislations and policies
 - ICT policy
 - Data Protection
 - Copyright
 - Information Privacy
 - others
- 7.1.1.9.T7 Enforcement measures for ICT legislation and policies

7.1.1.10T LIFE SKILLS

THEORY

7.1.1.10.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning and importance of life skills
- b) describe life skills

CONTENT

7.1.1.10.T1 Meaning and importance of life skills

7.1.1.10.T2 Life skills

- time management
- self awareness
- self esteem
- emotions and stress management
- people skills
- others

7.1.1.11T CONFLICT MANAGEMENT

THEORY

7.1.1.11.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning of conflict
- b) explain the importance of conflict management
- c) describe the types of conflicts
- d) explain the causes of conflicts
- e) describe the techniques of managing conflicts

CONTENT

7.1.1.11.T1 Meaning of conflict

7.1.1.11.T2 Importance of conflict management

7.1.1.11.T3 Types of conflicts

- workplace conflicts
- family or domestic conflicts
- others

7.1.1.11.T4 Causes of conflicts

- workplace
- family

7.1.1.11.T5 Techniques or approaches of managing conflicts

- preventive
- reactive

7.1.1.12T SOCIAL RESPONSIBILITY IN INFORMATION COMMUNICATION TECHNOLOGY (ICT)

THEORY

7.1.1.12.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:-

- explain the meaning and importance of social responsibility
- describe social responsibilities in ICT
- explain the challenges of social responsibility in ICT

CONTENT

7.1.1.12.T1 Meaning and importance of social responsibility

- Social responsibilities in ICT

7.1.1.12.T2 environmental protection

- confidentiality and privacy

7.1.1.12.T3 Challenges of social responsibility in ICT

7.1.1.13T EMERGING TRENDS IN ICT AND ETHICS

THEORY

7.1.1.13.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:-

- identify emerging trends in ICT and ethics
- explain the challenges and opportunities of emerging trends in ICT and ethics
- cope with the challenges of emerging trends in ICT and ethics

CONTENT

7.1.1.13.T1 Emerging trends in ICT and ethics

7.1.1.13.T2 Challenges and opportunities of emerging trends in ICT ethics

7.1.1.13.T3 Coping with the challenges of emerging trends in ICT and ethics

TEACHING/LEARNING RESOURCES

- A computer system
- peripheral devices
- Operating system and application software
 - Ms Windows, Linux, and any of the application
- Whiteboard
- Relevant text books and free e-books
- Online content (www.howstuffworks.com, www.wikipedia.com...)

ASSESSMENT MODE

- Written Tests
- Practical tests
- Projects

8.1.2. COMPUTER APPLICATION I (HOURS 140)

8.1.2.01: INTRODUCTION

This module unit is designed to equip the trainee with knowledge, skills and attitudes that will enable him/her with appreciating computer application.

8.1.2.02: GENERAL OBJECTIVES

By the end of this topic, the trainee should be able to:

- a) understand the basic concept of computer application
- b) appreciate and use word processing application software
- c) use spreadsheet application software
- d) use database application software
- e) appreciate and use desktop publishing
- f) appreciate the application of internet and e-mail facilities
- g) appreciate and use presentation application software

8.1.2.03: COURSE SUMMARY AND TIME ALLOCATION

CODE	TOPIC	SUB-TOPIC	TIME		TOTAL
			T	P	
8.1.2.1	INTRODUCTION TO COMPUTER APPLICATION	<ul style="list-style-type: none">• meaning• describe types of software• state application areas	2	0	2
8.1.2.2	INTRODUCTION TO OPERATING SYSTEM ENVIRONMENT	<ul style="list-style-type: none">• meaning• characteristics of OS• launching and closing OS• manipulating key board and mouse• feature of graphical and character use interface• identify basic computer information• using various storage media• manipulation of files and features• scanning and cleaning virus• accessory programs	4	6	10

CODE	TOPIC	SUB-TOPIC	TIME T P	TOTAL
8.1.2.3	WORD PROCESSING	<ul style="list-style-type: none"> • Starting word processor • Editing and formatting a document • opening and editing • text manipulation • formatting tools • creating and formatting a table • calculations in tables • charts creation • mail merge 	1 1	2
8.1.2.4	STYLES, TEMPLATES AND GRAPHICAL EFFECTS	<ul style="list-style-type: none"> • styles and templates • graphics • graphical effects 	0 2	2
8.1.2.5	TABLE OF CONTENT, LIST OF FIGURES AND PRINTING	<ul style="list-style-type: none"> • generating tables of content • generating list of figures • print previews 	0 4	4
8.1.2.6	MACROS EMERGING TRENDS	<ul style="list-style-type: none"> • printing macros • emerging trends 	2 2	4
8.1.2.7	INTRODUCTION AND STARTING SPREADSHEET APPLICATION	<ul style="list-style-type: none"> • definition of spread sheet • importance of spread sheets • opening and closing • screen layout • entering, formatting and editing of data 	1 5	6
8.1.2.8	FUNCTIONS, CALCULATIONS AND SPREAD SHEET TOOLS	<ul style="list-style-type: none"> • functions • linking spreadsheets • tools • help 	2 4	6
8.1.2.9	MACROS	<ul style="list-style-type: none"> • writing a macro program 	0 2	2
8.1.2.10	CHARTS AND PRINTING EMERGING TRENDS	<ul style="list-style-type: none"> • charts • printing of worksheet and charts • emerging trends 	1 5	6
8.1.2.11	INTRODUCTION TO DATABASES	<ul style="list-style-type: none"> • definition • uses of databases • advantages • types of databases • database creation 	2 0	2

CODE	TOPIC	SUB-TOPIC	TIME T P	TOTAL
8.1.2.12	TABLES	<ul style="list-style-type: none"> • data types • types of keys • table of keys • table creation • entering data • editing tables 	1 5	6
8.1.2.13	RELATIONSHIPS	<ul style="list-style-type: none"> • types of relations • linking tables • sorting and filtering 	1 1	2
8.1.2.14	FORMS	<ul style="list-style-type: none"> • creating forms • entering data in forms • editing and formatting 	2 4	6
8.1.2.15	QUERIES	<ul style="list-style-type: none"> • importance • creating queries • listing and formatting queries • calculated field 	2 3	5
8.1.2.16	REPORTS	<ul style="list-style-type: none"> • importance • creating report • modifying and adding graphs • calculations • headers and footers 	1 5	6
8.1.2.17	PRINTING	<ul style="list-style-type: none"> • printing of various objects 	0 4	4
8.1.2.18	EMERGING TRENDS IN DATABASE AP- PLICATION	<ul style="list-style-type: none"> • identifying emerging trends • copying with trends 	2 0	2
8.1.2.19	DESKTOP PUBLISH- ING	<ul style="list-style-type: none"> • definitions • characteristics • importance of desktop publishing • types of desktop publishing 	2 0	2
8.1.2.20	DATA MANIPULA- TION	<ul style="list-style-type: none"> • data • text • graphics • creating and inserting tables • indexing tables of contents and data 	0 6	6

CODE	TOPIC	SUB-TOPIC	TIME T P	TOTAL
8.1.2.21	EDITING, FORMATTING AND TRANSFORMATION OF SHAPES	<ul style="list-style-type: none"> • spell checking a document • editing • creating multi-page document • creating and modifying frames • creating and enhancing drawings • aligning ,resizing, coping and pasting objects • adding and assigning objects to layers 	0 8	8
8.1.2.22	IMPORTING AND EXPORTING FILES AND DOCUMENTS	<ul style="list-style-type: none"> • importing files and documents • exporting files and documents • merging file and graphs 	2 6	8
8.1.2.23	PRINTING	<ul style="list-style-type: none"> • printing pictures • printing graphs • printing text 		
8.1.2.24	EMERGING TRENDS IN DESKTOP PUBLISHING	<ul style="list-style-type: none"> • identifying emerging trends 	1 0	1
8.1.2.25	PRESENTATION APPLICATION	<ul style="list-style-type: none"> • definition • types • importance 	1 0	1
8.1.2.26	STARTING	<ul style="list-style-type: none"> • opening and closing presentation • screen layout • opening and closing an existing document 	0 2	2
8.1.2.27	CREATING PRESENTATIONS AND SLIDES	<ul style="list-style-type: none"> • create presentation and slides • change slide layout, add and remove a slide • change the order of slides in a presentation • save presentation and slides 	2 2	4

CODE	TOPIC	SUB-TOPIC	TIME T P	TOTAL
8.1.2.28	EDITING AND FORMATTING SLIDE PRESENTATIONS	<ul style="list-style-type: none"> • editing slides • formatting and resizing slides • adding, footer, header, date, time and page numbers to slides 	1 3	4
8.1.2.29	CREATING TEMPLATES	<ul style="list-style-type: none"> • definition • using template • creating your own master slide template • colour schemes 	2 4	6
8.1.2.30	INSERTING OBJECTS	<ul style="list-style-type: none"> • insert clips arts and objects • modifying clip arts and objects 	2 2	4
8.1.2.31	SLIDE SHOW AND PRINTING	<ul style="list-style-type: none"> • customize slide • slide transition • slide timing • slide presentation • slide printing 	1 3	4
8.1.2.32	EMERGING TRENDS IN PRESENTATION	<ul style="list-style-type: none"> • identification of emerging trends 	1 0	1
8.1.2.33	INTERNET AND E-MAIL APPLICATION	<ul style="list-style-type: none"> • definition • concepts • historical background • uses and importance • opening an e-mail account • sending and receiving mails • managing e-mail messages • surfing the internet 	3 3	6
8.1.2.34	EMERGING TRENDS IN INTERNET	<ul style="list-style-type: none"> • identifying emerging trends 	1 0	1
TOTAL			140 HRS	

8.1.2.1T INTRODUCTION TO COMPUTER APPLICATIONS

THEORY

8.1.2.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) meaning of computer application
- b) explain software concepts
- c) describe types of software
- d) state application areas of various software

CONTENT

8.1.2.1.T1 Meaning of computer application

8.1.2.1.T2 Describing different types of software

- software concepts
- software types
 - system software
 - operating system
 - system utilities
- application software
 - packages
 - in-house

8.1.2.1.T3 Stating the application of computers

- computer as a tool
- computer application areas

8.1.2.2T INTRODUCTION TO ENVIRONMENT

THEORY

8.1.2.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) meaning of operating systems
- b) explain the functions of operating system
- c) describe the types of operating system
- d) demonstrate skills in the use of operating system commands

CONTENT

8.1.2.2.T1 Definition of operating system

8.1.2.2.T2 Stating the functions of an operating system

- 8.1.2.2.T3** Descriptions of the types of operating system
- 8.1.2.2.T4** Demonstration of skills in the use of operating systems command
- internal commands
 - external commands
 - performance optimization commands

PRACTICE

9.1.2.2.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) use of operating system commands

CONTENT

- 8.1.2.2.P1** Using operating commands
- internal commands
 - external commands
 - performance optimization commands

8.1.2.3T **WORD PROCESSING**

THEORY

8.1.2.3.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) define word processors
b) understand word processing concepts
c) explain the features of a word processors

CONTENT

- 8.1.2.3.T1** Definition of word processing
- 8.1.2.3.T2** Understanding of word processing concepts
- creation of a document
 - printing of a document
 - independence of the operations of creation
 - printing
- 8.1.2.3.T3** Explanation of the features of word processors
- cursor movement
 - keys
 - mouse
 - editing keys
 - return/enter

- deletion
- insertion
- document format keys
 - space
 - tab
- moving and copying text within a document

PRACTICE

9.1.2.3.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain skills in document formatting
- b) explain skills in document printing
- c) explain skills in mail merging
- d) explain skills in table creating and line drawing
- e) explain skills in the use of templates
- f) develop multiple column formats
- g) explain skills in the use of word processing utilities
- h) explain skills in the use of graphs, formulae and functions
- i) explain skills in the used of macros
- j) outline skills in the use of advanced word processing facilities

CONTENT

8.1.2.3.P1 Skills in document formatting

- page format
 - margins
 - headers and footer
 - alignment
 - orientation
- indenting
- text formatting
- text styles
 - underline
 - bold
 - italics
- typeface and size
 - typeface (fonts)
 - font size

8.1.2.3.P2 Skills in document printing

- single or multiple copy
- full or part of document
- orientation

- landscape
- portrait
- printer selection

- 8.1.2.3.P3** Skills in mail merging
- data source document creating
 - main document
 - merging
- 8.1.2.3.P4** Skills in table creation and line drawing
- 8.1.2.3.P5** Skills in table creation and line drawing
- tables
 - line draw
- 8.1.2.3.P6** Skills in use of templates
- 8.1.2.3.P7** Multiple column formats
- newspaper columns
 - parallel columns
- 8.1.2.3.P8** Skills in use of word processing utilities
- sorting
 - selection
 - spell checking
 - thesaurus
 - bookmarks
 - grammar checkers
- 8.1.2.3.P9** Skills in use of object formulae and equations
- objects
 - formulae
 - functions
 - special symbols
- 8.1.2.3.P10** Skills in the use of macros
- 8.1.2.3.P11** Skills in the use of advanced work processing features
- table of contents
 - table of figures
 - indexes
 - electronic mail

8.1.2.4T SPREADSHEET

THEORY

8.1.2.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define a spreadsheet
- b) state the concepts of spreadsheet

CONTENT

8.1.2.4.T1 Definition of a spreadsheet

8.1.2.4.T2 Stating the concepts of spreadsheets

- traditional analysis sheet
- concepts of the spreadsheets
 - automatic calculations
 - “What if” analysis
 - graphical analysis

PRACTICE

9.1.2.4.P0 Specific Objectives

By the end of this topic the trainee should be able to:

- a) explain the worksheet formatting
- b) explain cell data types
- c) explain the worksheet layout
- d) use formulae and functions
- e) explain charting
- f) describe skills in simple database management
- g) describe worksheet and chart printing
- h) explain the use of utilities
- i) explain the use of macros

CONTENT

8.1.2.4.P1 Explanation of the worksheet layout

- columns
- rows
- cells
- single cell referencing
- range of cell referencing
- referencing using labels
- absolute and relative cell referencing

8.1.2.4.P2 Worksheet formatting

- fonts
- alignments

- column width and row height
 - borders
 - enhancing data appearance
 - page formatting
- 8.1.2.4.P3** Explanation of cell data types
- labels
 - values
 - formulae
- 8.1.2.4.P4** Using formulae and functions
- formulae
 - functions
- 8.1.2.4.P5** Explaining charting
- data ranges
 - chart/graph types
 - graph headings
 - additional facilities
 - column
 - 2D/3D graphs
 - page layout
 - gridlines
 - synchronization
- 8.1.2.4.P6** Explaining skills in simple database management
- worksheet database
 - data forms
 - linking worksheet
 - linking
 - query/extraction
- 8.1.2.4.P7** Printing of worksheets and charts
- 8.1.2.4.P8** Using utilities
- sorting
 - spell checking
 - filtering
- 8.1.2.4.P9** Explaining the use of macros
- definition
 - recording storing key strokes
 - editing and debugging
 - printing/laying back macros
 - advanced macro command

- macro libraries

8.1.2.5T DATABASE

THEORY

8.1.2.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- define database
- explain the concepts of a database structure

CONTENT

8.1.2.5.T1 Definition of database

8.1.2.5.T2 Explanation of the database concepts

- traditional filing methods
- functions of databases
- types of databases models
- database procedure

PRACTICE

9.1.2.5.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- define the design of a database structure
- create a database
- describe retrieving and editing facilities
- explain sorting and indexing
- explain logic and arithmetic functions
- explain querying
- explain reporting and labeling
- describe screen/view formatting
- explain linking of databases
- explain macros

CONTENT

8.1.2.5.P1 Description of the database structure

- field name
- field types
- field width
- table

- 8.1.2.5.P2** Creating a database
- data entry
 - saving
- 8.1.2.5.P3** Description of retrieval and editing facilities
- retrieving
 - loading
 - browsing
 - listing
 - displaying
 - editing
 - appending
 - insertion
 - deletion
 - recalling
 - altering databases structure
- 8.1.2.5.P4** Explanation of sorting and indexing
- sorting
 - ascending order
 - descending order
 - selective sorting
 - indexing
 - single field
 - selective indexing
 - levels of indexing
- 8.1.2.5.P5** Explanation of logic and arithmetic functions
- 8.1.2.5.P6** Explanation of querying
- single field conditions
 - multiple field conditions
 - logical operators
 - AND
 - OR
 - NOT
- 8.1.2.5.P7** Explanation of reporting and labeling
- 8.1.2.5.P8** Description of screen/view formatting
- layout
 - labels
 - fields
 - purpose
 - help

- 8.1.2.5.P9** Explanation of linking of databases
- tables of same databases
 - table of different databases

- 8.1.2.5.P10** Explanation database management
- standards
 - database design
 - data security
 - data integrity
 - co-ordination
 - quality control
 - tuning and performance

- 8.1.2.5.P11** Explanation of macros
- creating macros
 - saving macros
 - using macros

8.1.2.6T DESKTOP PUBLISHING

THEORY

8.1.2.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define desktop publishing
- b) explain the concepts of desktop publishing

CONTENT

8.1.2.6.T1 Definition of desk top publishing

8.1.2.6.T2 Explanation of the concepts of desk top publishing

PRACTICE

9.1.2.6.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain pay layout
- b) explain text manipulation
- c) describe arts and graphics
- d) describe presentation templates
- e) explain object linking and embedding
- f) explain document and publishing

CONTENT

- 8.1.2.6.P1** Explanation of page layout
- margins
 - paper size
 - page formatting
- 8.1.2.6.P2** Explanation of text manipulation
- 8.1.2.6.P3** Description of arts and graphics
- 8.1.2.6.P4** Description of presentation templates
- 8.1.2.6.P5** Explanation of object linking and embedding
- 8.1.2.6.P6** Explanation of documents and publications

8.1.2.7T FINANCIAL APPLICATIONS

THEORY

8.1.2.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to

- a) explain the fundamentals of accounting
- b) explain the fundamentals of the payroll
- c) explain the fundamentals of stock control and inventory
- d) explain the fundamentals of purchasing and marketing

CONTENT

- 8.1.2.7.T1** Explanation of the fundamental of accounting
- definitions of accounting and bookkeeping
 - ledgers
 - financial statement
 - invoicing
- 8.1.2.7.T2** Explanation of fundamentals of payroll
- personnel payroll data
 - earnings
 - mandatory deductions
 - other deductions
 - job description and specifications
 - organizational income
- 8.1.2.7.T3** Explanation of the fundamentals of stock control and inventory
- receipt of issue
 - receipt of supply
 - stock reports
 - ordering

8.1.2.7.T4 Explanation of the fundamentals of purchasing and marketing

8.1.2.7.T5 Explanation of the fundamentals of banking and insurance

- banking
 - definition
 - custom account
 - interest and deposit accounts
 - loan and overdrafts
 - cash transfers
- Insurance
 - definition
 - types
 - customer accounts and records claims
 - actuarial principles

8.1.2.8T COMPUTER AIDED DRAWING

THEORY

8.1.2.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define computer aided drawing (CAD)
- b) explain CAD concepts
- c) explain the fundamentals of technical drawing
- d) explain the basics of computer graphics
- e) explain the fundamentals of computer charting

CONTENT

8.1.2.8.T1 Definition of computer aided drawing (CAD)

- CAD system configuration
- CAD input/out devices
- CAD facilities

8.1.2.8.T2 Explanation of CAD concepts

8.1.2.8.T3 Fundamentals of technical drawing

- types of lines and lettering
- techniques of dimensioning
- plan geometry figures
- orthographic and pictorial drawing
 - orthographic views of assembled drawing
 - assembly of exploded views
 - isometric drawings of objects with inclined sides, curves, circles

- 8.1.2.8.T4** Explanation of the basics of computer graphics
8.1.2.8.T5 Explanation of the fundamental of computer charting

8.1.2.9T APPLICATION AREAS

THEORY

8.1.2.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe retail systems
- b) describe financial systems
- c) describe industrial systems
- d) describe scientific and research system
- e) describe transportation systems
- f) describe communication systems
- g) describe educational systems
- h) describe entertainment systems
- i) describe mathematical systems
- j) describe computer aided engineering
- k) describe operations management
- l) describe hotel systems
- m) describe other application areas

CONTENT

- 8.1.2.9.T1** Description of retail systems
8.1.2.9.T2 Description of financial systems
8.1.2.9.T3 Description of industrial systems
- simulation
 - process control
 - CAM
- 8.1.2.9.T4** Description of scientific and research systems
8.1.2.9.T5 Description of communication systems
- routing
 - scheduling
 - fleet size and composition
 - air reservation
- 8.1.2.9.T6** Description of communication systems
8.1.2.9.T7 Description of educational systems
- computer aided learning (CAL)
 - computer aided instruction (CAI)

- computer managed learning (CML)
- education management
 - registration
 - examination
 - stores
 - libraries
 - time tabling

- 8.1.2.9.T8** Description of entertainment systems
- 8.1.2.9.T9** Description of mathematical systems
- 8.1.2.9.T10** Description of computer aided engineering
- 8.1.2.9.T11** Description of operations management
 - maintenance
 - repair
- 8.1.2.9.T12** Description of hotel systems
- 8.1.2.9.T13** Description of other application areas

8.1.2.10T APPLICATION TRENDS

THEORY

8.1.10.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- explain internet technology
- explain multimedia technology
- explain artificial intelligence
- explain virtual reality
- explain office automation
- explain work groups
- explain parallel processing
- explain other future trends

CONTENT

- 8.1.2.10.T1** Explanation of Internet technology
- 8.1.2.10.T2** Explanation of multimedia technology
- 8.1.2.10.T3** Explanation of artificial intelligence
 - meaning of artificial intelligence
 - AI application area
 - advantages and disadvantages of AI
- 8.1.2.10.T4** Explanation of virtual reality
- 8.1.2.10.T5** Explanation of office automation

- 8.1.2.10.T6** Explanation of work groups
- 8.1.2.10.T7** Explanation of parallel processing
- 8.1.2.10.T8** Description of future trends
- hardware
 - software
 - application
 - system software
 - programming
 - ergonomics

TEACHING/LEARNING RESOURCES

- Computer
- Relevant application software
 - Microsoft word, Open Office, Word Perfect ...
 - Microsoft Excel, Open Office, Lotus 123...
 - Microsoft Access, oracle DBMS...
 - Microsoft Publisher, Pagemaker, Adobe InDesign...
 - Microsoft Powerpoint, ...
- Whiteboard
- Printers and Printing papers
- Relevant text books and free e-books
- Online content (www.howstuffworks.com, www.wikipedia.com...)

ASSESSMENT MODE

- Written Tests
- Practical tests
- Projects

9.1.3. COMMUNICATION SKILLS (110 HOURS)

9.1.3.01: INTRODUCTION

At the end of this course unit, the trainee should comprehend and effectively use communication as required in a modern business office.

9.1.3.02: GENERAL OBJECTIVES

By the end of this course unit the trainee should be able to:

- a) learn and apply the principles of communication effectively
- b) use proper language in communication
- c) write and use various documents such as business correspondence, speeches, documents of meeting
- d) use oral, non verbal and visual communication effectively.

9.1.3.03: COURSE SUMMARY AND TIME ALLOCATION (110 HOURS)

CODE	TOPIC	SUB-TOPIC	HOURS
9.1.3.1	MEANING AND ROLE OF COMMUNICATION	<ul style="list-style-type: none">• definition of communication• role of communication organization	3
9.1.3.2	THEORY OF COMMUNICATION	<ul style="list-style-type: none">• conceiving the message• encoding the message• selecting the communication media• decoding the message• interpreting the message• providing feedback	3
9.1.3.3	PRINCIPLES OF COMMUNICATION	<ul style="list-style-type: none">• communicating patterns in firms• role of the Public Relations Department• communication difficulties in firms (barriers of communication).• language in communication• spoken	6
9.1.3.4	THE SYNTAX AND SEMANTICS	<ul style="list-style-type: none">• clear wording• arrangements of ideas• paragraphing	8

CODE	TOPIC	SUB-TOPIC	HOURS
9.1.3.5	SUMMARY	<ul style="list-style-type: none"> • summarising correspondence • summarising a whole passage of part • consideration in summary writing length • vocabulary • layout • continuity • interaction of students own ideas • summarising speeches • summarising telephone conversation 	14
9.1.3.6	BUSINESS CORRESPONDENCE	<ul style="list-style-type: none"> • business letter (all types) • memorandum • circulars • telegram/telex/cables • press advertising • questionnaires • message forms • posters • notices 	18
9.1.3.7	MEETINGS	<ul style="list-style-type: none"> • different types of meetings • purposes of meetings • terminologies used in meetings • documents used in meetings • advantages and disadvantages of meetings 	14
9.1.3.8	REPORTS	<ul style="list-style-type: none"> • types of reports • purpose of reports • structure and contents • format and presentation • short informal reports • style and language 	12
9.1.3.9	ORAL COMMUNICATION	<ul style="list-style-type: none"> • face-to-face communication • speech writing and presentation • oral report • importance and non-verbal communication • non verbal communication importance • types of non-verbal communication 	16

CODE	TOPIC	SUB-TOPIC	HOURS
9.1.3.10	VISUAL COMMUNICATION	<ul style="list-style-type: none"> • interpretation of various visual aids • organisation charts • tables • graphs • pie and cake charts • histograms • flow-charts etc • audio-visual aids • boards • tape recorders • overhead projectors • plastigraphs • filmstrips and slides 	16

9.1.3.1T MEANING OF COMMUNICATION

THEORY

9.1.3.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define communication correctly
- b) explain the role of communication in organizations

CONTENT

9.1.3.1.T1 Definition of communication

9.1.3.1.T2 Role of communication in organization

9.1.3.2T THEORY AND PROCESS

THEORY

9.1.3.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the process of communication

CONTENT

9.1.3.2.T1 Conceiving the message

9.1.3.2.T2 Encoding the message

9.1.3.2.T3 Selecting the communication medium

- 9.1.3.2.T4 Decoding the message
- 9.1.3.2.T5 Interpreting the message
- 9.1.3.2.T6 Providing feedback

9.1.3.3T **PRINCIPLES OF COMMUNICATION**

THEORY

9.1.3.3.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) identify the various principles of communication

CONTENT

- 9.1.3.3.T1 Communication patterns in firms
 - vertical internal communication
 - lateral internal communication
 - diagonal internal communication
 - grapevine communication
- 9.1.3.3.T2 External communication (to outside firms)
 - Role of the Public Relations Department
- 9.1.3.3.T3 Communication difficulties in firms (barriers of Communication)
 - technical barriers
 - physical barriers
- 9.1.3.3.T4 Language in Communication
 - written
 - spoken

9.1.3.4T **THE SYNTAX AND SEMANTICS**

THEORY

9.1.3.4.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) construct sentences and arrange words correctly.

CONTENT

- 9.1.3.4.T1 Clear Wording
- 9.1.3.4.T2 Arrangement of ideas
- 9.1.3.4.T3 Sentences construction

9.1.3.4.T4 Paragraphing

9.1.3.5T SUMMARY

THEORY

9.1.3.5.T0 Specific Objective

At the end of this topic, the trainee should be able to:

a) summarize information from given correspondence

CONTENT

9.1.3.5.T1 Summarizing correspondence

9.1.3.5.T2 Summarizing a whole or a part of a given passage

9.1.3.5.T3 Consideration in summary writing

9.1.3.5.T4 length

- vocabulary
- layout
- continuity
- interaction of a students own ideas
- summarizing speeches
- summarizing telephone conversation

9.1.3.6T BUSINESS CORRESPONDENCE

THEORY

9.1.3.6.T0 Specific Objective

By the end of this topic, the trainee should be able to:

a) write the various types of business correspondence

CONTENT

9.1.3.6.T1 Business letters (all types)

9.1.3.6.T2 Memorandum

9.1.3.6.T3 Telegram/Telex/Cables

9.1.3.6.T4 Press Advertisement

9.1.3.6.T5 Questionnaire

9.1.3.6.T6 Messages

9.1.3.6.T7 Posters

9.1.3.6.T8 Notices

9.1.3.7T MEETINGS (Group Decision and Managerial Decisions)

THEORY

9.1.3.7.T0 Specific Objective

By the end of this topic, the trainee should be able to:

- a) identify the different types of meetings, purpose, terminology and documents used in meeting.

9.1.3.7.T1 Different types

- formal meetings
- committee meetings
- command meetings

9.1.3.7.T2 Purpose of meetings

9.1.3.7.T3 Terminologies used in meetings

9.1.3.7.T4 Documents used in meetings

9.1.3.7.T5 Advantages of meetings and disadvantages

9.1.3.8T REPORTS

THEORY

9.1.3.8.T0 Specific Objective

At the end of this topic, the trainee should be able to:

- a) prepare business reports using the correct format

CONTENT

9.1.3.8.T1 Types of Reports

- solicited
- unsolicited
- annual report
- routine

9.1.3.8.T2 Purpose of reports

9.1.3.8.T3 Structure and content

9.1.3.8.T4 Format and presentation

- letter form
- memorandum form
- schematic form

9.1.3.8.T5 Style and Language

9.1.3.9T ORAL COMMUNICATION AND NON-VERBAL COMMUNICATION

THEORY

9.1.3.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) communicate orally, prepare and present speeches effectively and non-verbal communication to strengthen the spoken work.

CONTENT

9.1.3.9.T1 Face-to-Face Communication

- The characteristics of face to face exchange
 - oral statements
 - preparations
 - delivery
 - planning and conducting interviews

9.1.3.9.T2 Barriers to effective face-to-face communication

- lack of interaction
 - antagonism - evident or underlying
 - failure to understand
 - too much information given

9.1.3.9.T3 Talking to Groups

- effective listening
- the telephone
- the quality of telephone services
- speech writing and presentation
- oral support

9.1.3.9.T4 Non-verbal communication

- importance of non-verbal communication
- types of non-verbal communication
- facial expression
- eye-contact
- tone of voice
- gestures
- postures
- physical contact
- paralinguistic

9.1.3.10T VISUAL COMMUNICATION

THEORY

9.1.3.10.T0 Specific Objective

By the end of this topic, the trainee should be able to:

- a) interpret information from various visual aids.

CONTENT

- 9.1.3.10.T1** Organization charts
- 9.1.3.10.T2** Charts
- 9.1.3.10.T3** Table
- 9.1.3.10.T4** Line graphs
- 9.1.3.10.T5** Bar-charts
- 9.1.3.10.T6** Pictographs
- 9.1.3.10.T7** Pie and cake charts
- 9.1.3.10.T8** Histograms
- 9.1.3.10.T9** Flow-charts etc
- 9.1.3.10.T10** Boards
- 9.1.3.10.T11** Tape recorders
- 9.1.3.10.T12** Overhead projectors
- 9.1.3.10.T13** Plastigraphs
- 9.1.3.10.T14** Filmstrips and Slides

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- Online content (www.wikipedia.com...)
- Whiteboard
- Application which can generate charts and graphs
- Resource persons

ASSESSMENT MODE

- Written Tests
- Projects

10.1.4. STRUCTURED PROGRAMMING (200 HOURS)

10.1.4.01: INTRODUCTION

This module unit is intended to equip the trainee with knowledge and skills to write programs using structured programming languages.

10.1.4.02: General Objectives

By the end of this module unit the trainee should be able to:-

- a) understand the program development cycle
- b) apply development skills in pascal and c programming languages
- c) understand the various data types, control and data structures used in structured computer programs
- d) develop a program in a structured programming language

10.1.4.03: COURSE SUMMARY AND TIME ALLOCATION

PASCAL - 100 HOURS
C - 100 HOURS

CODE	TOPIC	SUB-TOPIC	TIME T P		TOTAL
10.1.4.1	INTRODUCTION TO STRUCTURED PROGRAMMING	<ul style="list-style-type: none">• structured programming• types of structured programming languages• history of programming languages• programming paradigms• hardware and software considerations for structured programming	8		8
10.1.4.2	PROGRAM DEVELOPMENT AND DESIGN	<ul style="list-style-type: none">• program development and design• program development cycle• structured programming concepts• program design tools	24		24
10.1.4.3	PROGRAM STRUCTURE	<ul style="list-style-type: none">• program structure• format of a structured programming language• operators• data types	8		8

CODE	TOPIC	SUB-TOPIC	TIME		TOTAL
			T	P	
10.1.4.4	PROGRAM WRITING	<ul style="list-style-type: none"> writing a program in a structured language handling errors 	4	28	32
10.1.4.5	CONTROL STRUCTURES	<ul style="list-style-type: none"> control structures importance of control structures types of control structures 	8	24	32
10.1.4.6	DATA STRUCTURES	<ul style="list-style-type: none"> data structures types of data structures sort techniques search techniques 	8	32	40
10.1.4.7	SUB-PROGRAMS	<ul style="list-style-type: none"> sub-programs types of sub-programs scope of variables parameters 	8	24	32
10.1.4.8	FILE HANDLING	<ul style="list-style-type: none"> importance of file handling types of files file organization techniques file design file handling operations 	4	8	12
10.1.4.9	PROGRAM DOCUMENTATION	<ul style="list-style-type: none"> program documentation importance of program documentation types of program documentation write program documentation 	4	4	8
10.1.4.10	EMERGING TRENDS IN PROGRAMMING	<ul style="list-style-type: none"> emerging trends in programming challenges of emerging trends in programming 	4		4

10.1.4.1T INTRODUCTION TO STRUCTURED PROGRAMMING

THEORY

10.1.4.1.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) explain meaning of structured programming
- b) identify different types of structured programming languages
- c) explain the historical development of programming languages
- d) describe programming paradigms
- e) explain computer hardware and software consideration

CONTENT

10.1.4.1.T1 Explaining the meaning of structured programming

- meaning of computer hardware and software
- classification of computer software

10.1.4.1.T2 Identifying different types of structured programming languages

- Pascal
- C
- Fortran
- Cobol
- others

10.1.4.1.T3 History of programming language

- machine language
- low level languages
- high level languages
- fourth generation languages
- fifth generation languages

10.1.4.1.T4 Programming Paradigms

- unstructured programming
- structured programming
- object – oriented programming
- visual programming
- internet based programming

10.1.4.1.T5 Computer hardware and software consideration

- hardware requirements
- appropriate Operating System

10.1.4.2T **PROGRAM DEVELOPMENT AND DESIGN**

THEORY

10.1.4.2.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:-

- explain the meaning of program development
- explain the meaning of program design
- describe programming development cycle
- describe structured programming design concepts
- describe program design tools

CONTENT

10.1.4.2.T1 Explain the meaning of program development

10.1.4.2.T2 Explain the meaning of program design

10.1.4.2.T3 Describe programming development cycle

10.1.4.2.T4 Describe structured programming design concepts

- top-down design
- bottom-up design
- modular design
- control flow structure
- monolithic design

10.1.4.2.T5 Describing program design tools

- algorithms
- flowchart
- pseudocode
- structured charts
- decision tables

10.1.4.3T **PROGRAM STRUCTURE**

THEORY

10.1.4.3.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:-

- a) explain the meaning of program structure
- b) describe the format of a structured programming language
- c) describe common operators
- d) describe data types
- e) describe identifiers, expressions and I/O instructions

CONTENT

- 10.1.4.3.T1 Explain the meaning of program structure
- 10.1.4.3.T2 Describe the format of a structured programming language
- 10.1.4.3.T3 Describe common operators
 - operators and order of precedence
 - operations
- 10.1.4.3.T4 Describe data types
 - simple
 - structured
 - user defined
- 10.1.4.3.T5 Describe identifiers, expressions and I/O instructions

10.1.4.4T PROGRAM WRITING

THEORY

10.1.4.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) describe the content of a structured program
- b) describe the error handling

CONTENT

- 10.1.4.4.T1 Describing the content of structured programming
- 10.1.4.4.T2 Describing error handling

PRACTICE

10.1.4.4.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) write a program in a structured language
- b) handle errors

CONTENT

- 10.1.4.4.T3 Write a program in a structured language
 - coding
 - compiling
 - debugging
 - testing
 - execution and program deployment

10.1.4.4.T4 Errors handling

10.1.4.5T CONTROL STRUCTURES

THEORY

10.1.4.5.T0 Specific Objectives

By the end of the topic, the trainee should be able to:-

- a) explain the meaning of control structures
- b) describe the importance of control structures

CONTENT

10.1.4.5.T1 Explain the meaning of control structures

10.1.4.5.T2 Importance of control structures

10.1.4.5.T3 Types of control structures

- Sequence
- Selection
- Looping / Iteration

PRACTICE

10.1.4.5.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) Implement control structures

CONTENT

10.1.4.5.T4 Implementing control structures

10.1.4.6T DATA STRUCTURES

THEORY

10.1.4.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning of data structures
- b) identify the different types of data structures
- c) explain different types of sort techniques
- d) explain different types of search techniques

CONTENT

10.1.4.6.T1 Meaning of data structures

10.1.4.6.T2 Types of data structures

- strings
- lists
- arrays
- records
- pointers
- linked lists
- queues
- stack
- trees

10.1.4.6.T3 Sort techniques

- bubble sort
- selection sort
- quick sort
- insertion sort
- merge sort

10.1.4.6.T4 Search techniques

- sequential
- binary
- merge

PRACTICE

10.1.4.6.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

a) implementing the following

- strings
- lists
- arrays
- records
- pointers
- bubble sort
- sequential search

CONTENT

10.1.4.6.P1 Implement the following

- strings
- lists

- arrays
- records
- pointers
- bubble sort
- sequential search

10.1.4.7T SUB PROGRAMS

THEORY

10.1.4.7.T0 Specific Objectives

By the end of this topic, the trainee should be able:-

- define sub-programs
- identify the different types of sub-programs
- describe the scope of variables
- identify and implement Parameters

CONTENT

10.1.4.7.T1 Definition of sub-programs

10.1.4.7.T2 Types of sub-programs

10.1.4.7.T3 Scope of variables

- local
- global

10.1.4.7.T4 Parameters

- meaning of parameters
- parameter passing

PRACTICE

10.1.4.7.P0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- write sub-programs
- implement parameter passing

CONTENT

10.1.4.7.T5 Writing sub-programs

10.1.4.7.T6 Implementing parameter passing

10.1.4.8T FILE HANDLING

THEORY

10.1.4.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) describe of file handling
- b) identify the types of files
- c) describe file organization techniques
- d) explain file design
- e) explain file handling operations

CONTENT

10.1.4.8.T1 Importance of file handling

10.1.4.8.T2 Types of files

10.1.4.8.T3 File organization techniques

- sequential
- random
- indexed

10.1.4.8.T4 File design

10.1.4.8.T5 File handling operations

PRACTICE

10.1.4.8.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) design organizational file

CONTENT

10.1.4.8.P1 Designing organizational file

10.1.4.9T PROGRAM DOCUMENTATION

THEORY

10.1.4.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning of program documentation
- b) explain the importance of program documentation
- c) describe the types of program documentation
- d) write program documentation

CONTENT

- 10.1.4.9.T1 Define program documentation
- 10.1.4.9.T2 Importance of programming documentation
- 10.1.4.9.T3 Types of program documentation
- 10.1.4.9.T4 Writing program documentation

10.1.4.10T EMERGING TRENDS OF STRUCTURED PROGRAMMING

THEORY

10.1.4.10.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) identify emerging trends in structured programming
- b) explain the challenges of emerging trends in structured programming

CONTENT

- 10.1.4.10.T1 Identifying emerging trends in structured programming
- 10.1.4.10.T2 Explaining the challenges of emerging trends in structured programming

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- Sample codes from www
- Programming language online help
- White board

ASSESSMENT MODE

- Written Tests
- Practical Tests
- Programming Projects

11.1.5. COMPUTATIONAL MATHEMATICS (130 HOURS)

11.1.5.01: INTRODUCTION

This module unit is intended to equip the trainee with the knowledge, skills and attitudes to be used in the Information Communication Technology.

11.1.5.02: GENERAL OBJECTIVES

By the end of this module unit, the trainee should be able to:

- a) understand mathematical techniques relevant to Information Communication Technology
- b) use mathematical techniques to solve Information communication Technology problems
- c) apply mathematical principles in decision making
- d) appreciate the role of computational mathematics in Information Communication Technology

11.1.5.03: COURSE SUMMARY AND TIME ALLOCATION

CODE	TOPIC	SUB-TOPIC	HOURS
11.1.5.1	INTRODUCTION TO COMPUTATIONAL MATHEMATICS	<ul style="list-style-type: none">• algebra<ul style="list-style-type: none">- quadratic equations- simultaneous equations- linear equation with three or more unknowns- definition of matrices- matrix operation- application to matrices	14
11.1.5.2	NUMBER SYSTEMS AND BINARY ARITHMETIC	<ul style="list-style-type: none">• number systems<ul style="list-style-type: none">- decimal- binary- octal- hexadecimal• binary arithmetic	6
11.1.5.3	BINARY CODES	<ul style="list-style-type: none">• BCD• GRAY• alphanumeric code	4

CODE	TOPIC	SUB-TOPIC	HOURS
11.1.5.4	LOGIC GATES AND BOOLEAN ALGEBRA	<ul style="list-style-type: none"> • AND • OR • inverter • Boolean Algebra • NAND • NOR • implementation • exclusive OR • exclusive NOR 	7
11.1.5.5	DISCRETE COUNTING	<ul style="list-style-type: none"> • fundamental principles • permutations and combinations • binomial expansion 	14
11.1.5.6	GRAPHS AND FUNCTIONS	<ul style="list-style-type: none"> • continuous functions • (interpolations and extrapolations) • graphs of functions • areas under a curve • errors in graphs • in-equalities 	11
11.1.5.7	NUMERICAL ANALYSIS	<ul style="list-style-type: none"> • iterative method • approximation • errors • linear interpolation and extrapolation • finite differences 	16
11.1.5.8	DATA COLLECTION REPRESENTATION	<ul style="list-style-type: none"> • basic for data collection • data classification • data tabulation • data presentation 	5
11.1.5.9	MEASURES OF CENTRAL TENDENCY	<ul style="list-style-type: none"> • definition of measures • properties • calculation and calculations • interpretation 	5
11.1.5.10	MEASURES OF DISPERSION	<ul style="list-style-type: none"> • characteristics • relative and absolute measures • measures calculation and interpretation 	5

CODE	TOPIC	SUB-TOPIC	HOURS
11.1.5.11	ELEMENTS OF PROBABILITY	<ul style="list-style-type: none"> • modeling • scale • space • multiple probabilities • conditional probabilities • probability trees 	12
11.1.5.12	INTRODUCTION TO MODELING	<ul style="list-style-type: none"> • symbolic models • laws of modeling • generalizing models • spartial models • logical models • statistical models 	11

11.1.5.1T INTRODUCTION TO MODELLING

THEORY

11.1.5.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) apply the laws of modeling
- b) construct generalized and logical models
- c) describe statistical models
- d) model pseudocode

CONTENT

11.1.5.1.T1 Outline the laws of modeling

11.1.5.1.T2 Construct generalized models

11.1.5.1.T3 Explain logical models

- Boolean Algebra

11.1.5.1.T4 Explain statistical models

- Histograms
- Frequency polygons

11.1.5.1.T5 Model pseudocode

11.1.5.2T NUMERICAL ANALYSIS

THEORY

11.1.5.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define the term interaction
- b) derive an iterative formula for solving a given equation
- c) round off or truncate a given number to required degree of accuracy
- d) define types of errors
- e) calculate errors
- f) use partial derivatives to calculate errors
- g) define linear interpolation and linear extrapolation
- h) state the assumptions made in interpolation and extrapolation
- i) calculate the value of function within and outside a given interval
- j) define finite difference table for given function
- k) construct difference table for given function
- l) use the difference table to interpolate and extrapolate values of a given function

CONTENT

- 11.1.5.2.T1** Definition of an interaction
- 11.1.5.2.T2** Derivation of an interactive formula for solving functions such as: $F(x) = 0$
- Algebraic formula
 - Newton Raphson formula
- 11.1.5.2.T3** Rounding off or truncating a given number to required degree of accuracy
- 11.1.5.2.T4** Meaning of error types
- Relative error
 - Absolute error
 - % error
- 11.1.5.2.T5** Using partial derivation to calculate error
- 11.1.5.2.T6** Definition of linear interpolation and linear extrapolation
- linear interpolation
- 11.1.5.2.T7** Statement of assumption
- 11.1.5.2.T8** Calculation of values of functions
- 11.1.5.2.T9** Definition of finite difference table
- 11.1.5.2.T10** Construction of
- forward difference table
 - central difference table
 - backward difference table
- 11.1.5.2.T11** Using finite differences table to interpolate and extrapolate values of function
- linear interpolation table

- quadratic interpolation table
- Newton forward differences interpolation
- Newton-Gregory interpolation

11.1.5.3T NUMBER SYSTEMS AND BINARY ARITHMETIC

THEORY

11.1.5.3.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- represent decimal number in other number system
- convert binary numbers into other numbers systems and vice versa
- represent numbers in octal and vice versa
- represent number in hexadecimal and vice versa
- perform binary arithmetic

CONTENT

11.1.5.3.T1 Representation of decimal number system

- digits used in decimal system (0-9)
- representation of decimal number to binary, octal and hexadecimal
- representation of fractions

11.1.5.3.T2 Conversion of binary numbers

- binary digits (0, 1)
- representation of binary number to octal decimal and hexadecimal
- representation of multi-digit binary number
- applications
- bit
 - byte
 - word
 - kilobyte
 - megabyte
 - gigabyte

11.1.5.3.T3 Representation of octal numbers

- octal digits (0, 7)
- representation of octal numbers in binary, decimal and hexadecimal
- representation of multi-digit octal numbers
- application

11.1.5.3.T4 Representation of hexadecimal numbers

- hexadecimal (0-F)
- representation of binary, octal and decimal
- representation of multi-digit hexadecimal numbers
- application of hexadecimal number in microcomputers

- 11.1.5.3.T5** Performance of binary arithmetic
- perform binary addition using
 - straight binary
 - sign magnitude
 - perform binary subtraction using
 - straight binary
 - sign and magnitude
 - one's compliment
 - two's compliment
 - compare the use of binary subtraction methods in a digit system
 - perform binary multiplication
 - perform binary division
 - perform binary arithmetic using
 - fixed point
 - floating point arithmetic
 - compare and contrast the use of fixed points and floating points
 - arithmetic in digital machines
- 11.1.5.3.T6** Octal number systems
- state symbols of octal number systems as (0-7)
 - form octal numbers greater than 7
- 11.1.5.3.T7** Conversion of octal numbers to other number systems
- convert from octal to decimal and vice versa
 - convert from octal to binary and vice versa
 - convert from octal to hexadecimal and vice versa
- 11.1.5.3.T8** Hexadecimal numbers
- state symbols of hexadecimal as 0 through F
 - form hexadecimal numbers greater than F
- 11.1.5.3.T9** Conversion of hexadecimal numbers to other number systems
- convert from hexadecimal to binary and vice versa
 - convert from hexadecimal to octal and vice versa
 - convert from hexadecimal to decimal and vice versa
 - demonstrate the use of hexadecimal numbers in microcomputer assembly language

10.1.6. BINARY CODES

THEORY

11.1.6.3.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the need of various binary codes
- b) represent decimal numbers in binary coded decimals (BCD)
- c) perform BCD arithmetic
- d) explain the use of GRAY code
- e) represent characters in various alphanumeric codes in digital systems
- f) explain error detection and parity

CONTENT

11.1.6.3.T1 Explanation of need of binary codes

- explain the reason of using binary codes in digital systems
- define the following terms as applied to binary codes
 - weighted binary codes
 - reflective codes
 - sequential codes
 - non weighted codes
- state the use of binary codes with characteristics

11.1.6.3.T2 Representation of BCD numbers

- represent decimal number in the following BCD methods
 - 8421 BC
 - excess – 3
 - comparison of 8421 and excess – 3

11.1.6.3.T3 Performance of BCD arithmetic

- addition
- subtraction
- multiplication
- division

11.1.6.3.T4 Gray codes

- conversion of binary numbers into gray code and vice versa
- compare the use of gray codes and straight binary description of an
- application of gray code

11.1.6.3.T5 Representation of alphanumeric code

- explanation of the need for alphanumeric code
- representation of characters in
 - EBCDIC
 - ASCII

- comparison of use and limitation of alphanumeric codes

11.1.6.3.T6 Explain of error detection and parity

- odd and even parity
- generation of parity signal
- detection of errors using parity signals
- correction of errors using parity signals
- parity codes

11.1.6.1T LOGIC GATES AND BOOLEAN ALGEBRA (7 HOURS)

THEORY

11.1.6.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- explain the AND operation
- explain the OR operation
- explain the NOT (invert, complement) operation
- minimize logic expressions using Boolean algebra
- explain NAND operation
- explain NOR operation
- implement logic circuits using NAND gate only or NOR gates only
- explain the exclusive – OR (modulo – 2) operation
- explain the exclusive – NOR (configuration) operation

CONTENT

11.1.6.1.T1 Explanation of AND operation

- represent AND operation using series switches
- derive truth table for AND operation
- draw symbol for AND gate

11.1.6.1.T2 Explanation of OR operation

- represent OR operation using parallel switches
- derive the truth table for AND operation
- draw symbol for AND gate

11.1.6.1.T3 Explanation of NOT (Invert, Complement) operation

- Represent NOT operation using normally closed switch operationBya
- relay
- Derive the truth table of NOT operation
- Draw the symbol for NOT gate

- 11.1.6.1.T4** Minimization of logic expression using Boolean Algebra
- state Boolean identifiers for
 - prove Boolean laws
 - commutative
 - distributive
 - associate
 - prove De Morgan's theorem
 - implement logic circuits in AND, OR and NOT gates from Boolean
- 11.1.6.1.T5** Explanation of NAND operation
- show that NAND operation is equivalent to AND followed by an inverter
 - derive the truth table for NAND gate
 - draw the symbol for NAND gate
- 11.1.6.1.T6** Explanation of NOR operation
- show that NOR operation is equivalent to OR followed by an inverter
 - derive the truth table for NOR
 - draw the symbol for NOR gate
- 11.1.6.1.T7** Implementation of logic circuits using NAND gate only and NOR gates only
- show how NAND gates or NOR gates can be used as inverted gate to perform the operation of
 - NOT gate
 - AND gate
 - OR gate
 - explain equivalent logic representation in logic schematic diagrams and draw the equivalent representation for AND, OR and NOR
 - implement logic circuits in NAND gate only and NOR gates only.
- 11.1.6.1.T8** Explanation of exclusive – OR (modulo – 2) operation
- explain the exclusive OR operation
 - derive the truth table of exclusive – OR operation
 - draw the logic circuit of the exclusive - OR gate
 - draw the symbol for the exclusive – OR gate
- 11.1.6.1.T9** Explanation of exclusive NOR operation
- explain the exclusive -NOR operation
 - derive the truth table of exclusive – NOR operation
 - draw the logic circuit of the exclusive - NOR gate
 - draw the symbol for the exclusive – NOR gate

11.1.6.2T ALGEBRA

THEORY

11.1.6.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) solve quadratic equations
- b) solve simultaneous equations
- c) solve linear equations with three or more unknowns
- d) define a matrix
- e) identify various types of matrices
- f) carry out matrix operation
- g) determine the inverse of matrices
- h) use matrices to solve equations
- i) apply the knowledge of matrices in solving real-life problems

CONTENT

11.1.6.2.T1 Solving quadratic equations

- factorization
- completing the square
- formula method
- graphical method

11.1.6.2.T2 Reducing equations to quadratic

11.1.6.2.T3 Solving the reduces quadratic equations

11.1.6.2.T4 Solving linear equations with three unknowns

11.1.6.2.T5 Forming linear equations with three or more unknowns

11.1.6.2.T6 Defining a matrix

- row matrix or row vector (1, 2)
- column matrix or column vector [$\frac{1}{2}$]
- rectangular matrix
- square matrix
- singular matrix
- non-singular matrix
- null matrix
- identify matrix

11.1.6.2.T7 Carrying out matrix operations

- additional/ subtraction
- compatibility

- multiplication
- commutability and non-commutability
- division

11.1.6.2.T8 Determining the inverse of matrices up to order 3

- co-factor method
- row reduction method

11.1.6.2.T9 Using matrices to solve simultaneous equation

- cramer's rule
- inverse method
- row reduction (Gaussian Elimination)

11.1.6.2.T10 Applying the knowledge of matrices in solving real life problems industrial demand problems.

- output vector of the economy of say two industries
- message – coding
- storage of information

11.1.6.3T DISCRETE COUNTING

THEORY

11.1.6.3.T0 **Specific Objective**

By the end of this topic, the trainee should be able to:

- state the fundamental union and product rule on the finite set
- use the rule to determine the number of elements in the union and product of the finite sets
- determine the number of selections of elements from elements in sets
- define permutations and combinations
- apply permutation and combination various cases
- use binomial coefficient in computing combinations
- state the binomial theorem
- expand a given binomial theorem
- use binomial theorem to estimate errors of small changes
- use the theorem to derive power series

CONTENT

11.1.6.3.T1 Stating the fundamental union (addition) in finite sets

11.1.6.3.T2 Using the rule to determine the number of elements in the union and product of finite sets.

- 11.1.6.3.T3** Determine the number of selection of elements in a set
- with replacement
 - without replacement
- 11.1.6.3.T4** Define permutation and combination
- 11.1.6.3.T5** Apply permutation and combination in various cases
- 11.1.6.3.T6** Stating the binomial theorem
- 11.1.6.3.T7** Expanding a given binomial expression
- positive integers indices
 - negative integers indices
 - fraction indices
 - general term of expression
 - range of values of X for which the binomial series is convergent
- 11.1.6.3.T8** Using the binomial theorem estimate errors and small changes
- appreciation
 - depreciation
 - compound interest
 - small temperature changes
 - errors in measurement
- 11.1.6.3.T9** Derivatives of X power series

11.1.6.4T GRAPHS AND FUNCTION

THEORY

11.1.6.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) plot linear graph
- b) make interpretations from linear graph
- c) plot parabolic curves
- d) solve simultaneous and quadratic equations by the graphical methods
- e) present data in appropriate chart

CONTENT

- 11.1.6.4.T1** Plotting linear graphs
- Intercepts of the axes $y = 0$, $x = 0$
- 11.1.6.4.T2** Making interpretations
- Intercepts
 - Gradients
- 11.1.6.4.T3** Making interpretations

- $y = mx + c$

11.1.6.4.T4 Solution of simultaneous and quadratic equations by plotting (linear and parabolic) graphs.

11.1.6.4.T5 Presentation of data in charts

- Pie chart
- Bar chart
- Pictogram
- Histogram

11.1.6.5T ELEMENTS OF PROBABILITY

THEORY

11.1.6.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- discuss the basic concepts of probability
- apply the techniques of counting and set to probability
- apply the laws of probability
- calculate conditional probability
- apply probability distribution concepts to decision problems.

CONTENT

11.1.6.5.T1 Basic concepts

- types of concepts
- uses of probability

11.1.6.5.T2 Theory **Counting techniques**, set and probability

11.1.6.5.T3 Laws of probability and applications

- addition law
- multiplication law

11.1.6.5.T4 Conditional probability

- calculation
- bayes theorem
- application to decision problems
- probability trees

11.1.6.5.T5 Probability application and distribution

- poisson
- normal

11.1.6.6T DATA COLLECTION AND PRESENTATION

THEORY

11.1.6.6.T0 Specific Objectives

At the end of this topic, the trainee should be able to:

- a) explain the basic considerations for data collection
- b) classify collected data into various categories
- c) tabulate collected data
- d) present data diagrammatically and graphically

CONTENT

11.1.6.6.T1 Basic for data collection

- objectives and scope
- statistical units
- data sources and types
- collection methods and limitations

11.1.6.6.T2 Data classification

- classification functions
- rules
- types of classification

11.1.6.6.T3 Data tabulation

- definitions and parts of table
- types of tabulation
- applications

11.1.6.6.T4 Data presentation

- types of construction of diagrams
- types and construction of diagrams and graphs

11.1.6.7T MEASURES OF CENTRAL TENDENCY

THEORY

11.1.6.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- define the measures of central tendency
- state the properties of measures of central tendency
- determine the measures of central tendency

CONTENT

- 11.1.6.7.T1 Definition of measures
- 11.1.6.7.T2 Properties
- 11.1.6.7.T3 Calculations and interpretation
 - means (arithmetic geometric)
 - mode
 - medium

11.1.6.8T MEASURES OF DISPERSION

THEORY

11.1.6.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) state the characteristics of a good measures of dispersion
- b) differentiate between the absolute and relative measure
- c) calculate and interpret the measures of dispersion

CONTENT

- 11.1.6.8.T1 Characteristics
- 11.1.6.8.T2 Relative and absolute measures
 - definition
 - types
 - merits and demerits
- 11.1.6.8.T3 Measure calculation and interpretation
 - Range
 - Mean deviation
 - Quartiles, deciles, percentiles and S.I.R.
 - Standard deviation
 - Skewness and kurtosis

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- Whiteboard

ASSESSMENT MODE

- Written Tests

12.1.7. OPERATING SYSTEMS (100 HOURS)

12.1.7.01: INTRODUCTION

This module unit is intended to equip the trainee with knowledge, skills and attitudes to enable him/her use operating system in a computing environment.

12.1.7.02: GENERAL OBJECTIVES

By the end of the module unit the trainee should be able to:

- a) understand the principles of operating systems
- b) appreciate the functions of operating systems
- c) use operating systems in a computer environment

12.1.7.03: COURSE SUMMARY AND TIME ALLOCATION (100 HRS)

CODE	TOPIC	SUB TOPIC	HOURS	
12.1.7.1	INTRODUCTION TO OPERATING SYSTEM	<ul style="list-style-type: none">• meaning and importance of operating systems• historical development of operating systems• operating systems structure• types of operating systems• job control	10	
12.1.7.2	PROCESS MANAGEMENT	<ul style="list-style-type: none">• meaning and importance• inter-process communication• process scheduling• deadlocks• error diagnosis	16	4
12.1.7.3	MEMORY MANAGEMENT	<ul style="list-style-type: none">• meaning and importance• memory allocation techniques• virtual memory	10	10
12.1.7.4	DEVICE (I/O) MANAGEMENT	<ul style="list-style-type: none">• meaning and importance• principles of I/O hardware• principles of I/O software• disks• clocks• terminals• virtual device	18	10

CODE	TOPIC	SUB TOPIC	HOURS
12.1.7.5	FILE MANAGEMENT	<ul style="list-style-type: none"> • meaning and importance • file systems • file management techniques • file protection and security 	18 4
TOTAL			100

12.1.7.1T INTRODUCTION OPERATING SYSTEMS

THEORY

12.1.7.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of an operating systems
- b) define operating systems terminologies
- c) describe the historical development of operating systems
- d) describe the types of operating systems
- e) explain job control.

CONTENT

12.1.7.1.T1 Meaning and importance of operating systems

12.1.7.1.T2 Definition of the operating systems Terminology's

- processes
- files
- system calls
- shell
- virtual Machines

12.1.7.1.T3 The History of Operating Systems

- 1st Generation Operating Systems
- 2nd Generation Operating Systems
- 3rd Generation Operating Systems
- 4th Generation Operating Systems
- 5th generation Operating Systems

12.1.7.1.T4 Description of Operating Systems Structure

- monolithic system
- layered system

- client-server model

12.1.7.1.T5 Explanation of types of Operating System

- Traditional Operating system
- Multiprocessor Operating System
- Distributed Operating System

12.1.7.1.T6 Explanation of Job Control

- command languages
- job control languages
- system messages

12.1.7.2 PROCESS MANAGEMENT

THEORY

12.1.7.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- describe the process model
- explain inter process communication
- explain process scheduling
- explain deadlocks
- describe error diagnosis

CONTENT

12.1.7.2.T1 Process models

- process levels
- process states/models

12.1.7.2.T2 Inter process communication

- race conditions
- critical sections
- mutual exclusion with busy waiting
- sleep and wake up
- semaphores
- event counters
- monitors
- message passing
- equivalent of primitives

12.1.7.2.T3 Process scheduling

- job scheduling
- process scheduling
- scheduling algorithms
 - SJF
 - FCFS
 - round – robin
 - priority scheduling
 - pre-emptive scheduling
 - multiple queues
 - evaluation of round robin in multiprogramming
 - synchronizing performance considerations

12.1.7.2.T4 Deadlocks

- deadlocks
- deadlock detection and recovery
- deadlock avoidance
- deadlock prevention

12.1.7.2.T5 Description of Error Diagnosis

PRACTICE

12.1.7.2.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) handle inter process communication
- b) process scheduling
- c) deadlocks

CONTENT

12.1.7.2.T1 Handling of inter process communication

12.1.7.3T **MEMORY MANAGEMENT**

THEORY

12.1.7.3.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) explain the function of memory management
- b) explain memory allocation techniques
- c) explain virtual memory

CONTENT

12.1.7.3.T1 Memory management

- definition of memory management

- functions of memory management

12.1.7.3.T2 Memory allocation technique

- paging
- swapping
- segmentation
- partitioned allocations
- overlays

13.1.7.3.T3 Virtual memory

- basic concepts
- paging
- segmentation
- associative memory

PRACTICE

12.1.7.3.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- handle memory allocation techniques
- handle virtual memory

CONTENT

12.1.7.3.P1 Handling memory allocation

12.1.7.3.P2 Handling of virtual memory

12.1.7.4T **DEVICE I/O MANAGEMENT**

THEORY

12.1.7.4.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- explain the objectives of device (I/O) management
- explain the principles of I/O hardware
- explain the principles of I/O software
- explain the disks and disk operations
- describe the computer clocking systems
- explain computer terminals

CONTENT

- 12.1.7.4.T1** Objectives of device (I/O) management
- character code independence
 - device independence
 - efficiency
 - uniform treatment of devices
- 12.1.7.4.T2** Principles of device (I/O) Hardware
- I/O devices
 - device controllers
 - direct memory access
- 12.1.7.4.T3** Principles of I/O Software
- Goals of I/O software
 - Interrupt handlers
 - Device drivers
 - Device – independent I/O software
 - User – specific I/O software
- 12.1.7.4.T4** Disks and disk operations
- disk hardware
 - disk arm scheduling algorithms
 - error handling
 - track at a time caching
 - RAM disks
- 12.1.7.4.T5** Computer clocking system
- clock hardware
 - clock software
- 12.1.7.4.T6** Exploration of computer terminals
- terminal hardware
 - memory-mapped terminals
 - input software
 - output software
- 12.1.7.4.T7** Virtual devices
- objectives of virtual devices

- history of virtual devices
- spooling
- buffering
- caching

PRACTICE

13.1.7.4.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- handle I/O hardware and software
- disks and disk operation
- computer clocking systems
- handle computer terminal
- handle virtual devices

CONTENT

- 13.1.7.4.T8** Handling I/O hardware and software
- 13.1.7.4.T9** Handling disks and disk operations
- 13.1.7.4.T10** Handling clock systems
- 13.1.7.4.T11** Handling computer terminals
- 13.1.7.4.T12** Handling virtual devices

13.1.7.5T FILE MANAGEMENT

THEORY

13.1.7.5.T0 Specific Objective

By the end of this topic, the trainee should be able to:

- explain the functions of file management
- explain file systems
- explain file management techniques
- explain file protection and security

CONTENT

- 13.1.7.5.T1** **12.1.5.T1** File management
- definition of file management
 - objectives of file management
- 13.1.7.5.T2** **12.1.5.T2** File systems
- naming
 - structure
 - types

- attributes
- operations

- 13.1.7.5.T3** File management techniques
- file implementation
 - directory implementation
 - sharing
 - disk space management
 - file system management
 - file system reliability
 - file system performance
 - logical file system
 - physical file system
 - file allocation

- 13.1.7.5.T4** File protection and security
- meaning and importance
 - access control verification
 - audit trail

PRACTICE

13.1.7.5.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) to be able to implement access control
- b) implement audit trail

CONTENT

- 13.1.7.5.T1** Implementing access control

- 13.1.7.5.T2** Implementing audit trail

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- Online content (www.wikipedia.com...)
- Whiteboard
- Linux Operating system
- Ms Windows Operating system
- Resource persons

ASSESSMENT MODE

- Written tests

- Practical tests
- Orals tests
- Projects

14.1.8. ENTREPRENEURSHIP EDUCATION [154 HOURS]

14.1.8.01: INTRODUCTION

This course unit is intended to equip trainee with the necessary knowledge, skills and attitudes that will enable them start, operate a personal or group business enterprise.

It is also intended to install the drive necessary for any of them to venture into profit making activities.

14.1.8.02: GENERAL OBJECTIVES

By the end end of this topic, the trainee should be able to:

- c) demonstrate positive attitudes toward self-employment
- d) identify viable business opportunity
- e) understand factors liable to affect the success of a business
- f) portray a desire to venture into business
- g) apply entrepreneurial competencies in business situations
- h) acquire management skills necessary for running a successful enterprise.

14.1.8.03: SUBJECT SUMMARY AND TIME ALLOCATION - 154 HOURS

CODE	TOPIC	SUB-TOPIC	HOURS
14.1.8.1	ENTREPRENEURSHIP AND SELF EMPLOYMENT	<ul style="list-style-type: none">• importance of self employment• entrepreneurship contribution to national development	23
14.1.8.2	ENTREPRENEURSHIP OPPORTUNITIES	<ul style="list-style-type: none">• business opportunities• assessing product demand• matching of skills and resources to changing technology• evaluating of business environment	30

CODE	TOPIC	SUB-TOPIC	HOURS
14.1.8.3	ENTREPRENEURIAL AWARENESS	<ul style="list-style-type: none"> • types of business finance • contractual agreements • Government's policy on SEE • tendering procedures • problems of starting and operating a small enterprise. 	34
14.1.8.4	ENTREPRENEURIAL MOTIVATION	<ul style="list-style-type: none"> • internal motivation factors • techniques of self-assessment • external motivation factors 	14
14.1.8.5	ENTREPRENEURIAL COMPETENCIES	<ul style="list-style-type: none"> • decision making in business • instituting change • coping with competition • risk taking • techniques of time management • leadership 	25
14.1.8.6	ENTERPRISE MANAGEMENT	<ul style="list-style-type: none"> • evaluating business goals • efficiency of resource utilization • finance planning • production management • management of human resource • work study • marketing and public relations • information management • project planning 	28
TOTAL			154

14.1.8.1T ENTREPRENEURSHIP AND SELF-EMPLOYMENT

THEORY

14.1.8.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) state the importance of self-employment
- b) explain the entrepreneur's contribution to national development
- c) determine the requirements of entry into self-employment
- d) explain the roles of an entrepreneur in business

CONTENT

- 14.1.8.1.T1** Importance of self-employment
- meaning of self-employment
 - advantages of self-employment
- 14.1.8.1.T2** Entrepreneur's contribution to National Development
- creation of employment
 - provision of service
 - creation of goods
 - improved living standards
- 14.1.8.1.T3** Requirements for entry in to self-employment
- capital/financing
 - machinery and equipment/tools
 - machinery
 - how to improve
 - premises
 - importance
 - how to acquire
 - requirements of skills
 - entrepreneurial
 - management
 - industrial/technical
 - staffing
- 14.1.8.1.T4** Roles of entrepreneur in business
- organization/structuring
 - purpose
 - type
 - design
 - roles as:
 - promoter

- shareholder
- director

14.1.8.2T ENTREPRENEURIAL OPPORTUNITIES

THEORY

14.1.8.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) identify business opportunity
- b) assess the market demand for a chosen product
- c) match available skills and resources to changing technology
- d) evaluate prevailing business environment

CONTENT

14.1.8.2.T1 Identification of business opportunity

- importance of opportunity
- identifying a suitable opportunity
- process of selecting and processing
- guide to selection/assessment of opportunity

14.1.8.2.T2 Assessing product demand

- market survey
- consumer/user characteristics and behaviour
- location

14.1.8.2.T3 Matching skills and resources to changing technology

- sources of appropriate technology
 - product literature
 - trade fares and exhibitions
 - business tours

14.1.8.2.T4 Evaluating business environment

- market outlets
 - infrastructure
 - market conditions
 - price structure
 - competition
- incentives and the political environment
 - government initiatives
 - initiativesByothers

14.1.8.3T ENTREPRENEURIAL AWARENESS

THEORY

14.1.8.3.T0 Specific Objectives

At the end of this topic, the trainee should be able to:

- a) evaluate a given types of business finance
- b) engage in a contractual agreement
- c) identify the various measures which the government has initiated to promote the growth and development of small scale enterprises. (SSE)
- d) describe the procedure of starting a business
- e) prepare/ use tender documents following laid down (tendering) procedures
- f) explain various problems which an entrepreneur is liable to encounter whilst operating business.

CONTENT

- 14.1.8.3.T1** Evaluation of business finance
- types of capital
 - start up expenses
 - operation/ running expenses
 - expansion capital outlay
 - evaluation of various sources of business finance/loan
 - short term funds
 - medium term funds
 - long term funds
- 14.1.8.3.T2** Contractual agreement
- explanation of contract
 - Meaning
 - Types
 - essentials of a binding contract for
 - Partnership agreement
 - Employment contracts
 - Insurance
 - Negotiable instruments
 - legal aspects of business enterprise
 - sale of foods/services
- 14.1.8.3.T3** Government measures on small scale enterprises (SSE)
- Policy on rural industrialization
 - incentives
 - ministerial agencies that promote see development
 - parastatals that promote SSE development
- 14.1.8.3.T4** Procedure of starting a business
- identification of
 - business idea
 - location/premises

- registration of
 - business organization
 - business name
- trading license/permit
- opening up

14.1.8.3.T5 Preparation/use of tendering document

- client's requirements
- contractor's requirement
- presentation of tender documents
- processing tenders
 - authority
 - consideration of bids and offer of tender

14.1.8.3.T6 Problems liable to encounter when starting/operating business

- political climate
- changing tastes
- sustainable drive
- retaining skilful labour
- changing attitudes
- entrepreneurial attitudes
- knowledge of product market

14.1.8.4T ENTREPRENEURIAL MOTIVATION

THEORY

14.1.8.4.T0 **Specific Objectives**

At the end of this topic, the trainee should be able to:

- a) identify internal entrepreneurial motivation
- b) identify entrepreneurial incentives the external/national level
- c) describe the techniques of self- assessment

CONTENT

14.1.8.4.T1 Internal entrepreneurial motivators

- self actualization
- desire to succeed/achieve
- survival
- adventure
- independence
- profit maximization

14.1.8.4.T2 External/National motivation incentives

- infrastructure
- export/import incentives schemes
- pricing policy
- credit facilities
- education
- role models
- technology
- enabling environment

14.1.8.4.T3 Self-assessment techniques

- meditation
- strength – weakness – analysis test (SWAT)

14.1.8.5T ENTREPRENEURIAL COMPETENCIES

THEORY

14.1.8.5.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) make business decision
- b) explain the causes of change
- c) explain appropriate methods of instituting change
- d) explain how to cope with competition in business
- e) evaluate business risks
- f) manage time effectively
- g) explain appropriate leadership styles in business

CONTENT

14.1.8.5.T1 Decision making

- methods of decision making
 - rule of thumb
 - committee approach
 - critical path analysis
 - brains storming
- process of decision making

14.1.8.5.T2 Causes of change in

- product/service
- technology
- policy

14.1.8.5.T3 Methods of instituting change

- education and training
- persuasion
- innovativeness and creativity
- directive

14.1.8.5.T4 Coping with the competition

- process
 - understand competitor's advantages
 - comparing different strategy/strategies
 - making competitive changes
 - improvement of product/service
 - improvement/increase in efficiency i.e reduction of
 - production/unit cost
 - trade agreement/business associations
 - adjustment of market segmentation

14.1.8.5.T5 Evaluation of business risk

- characteristics of business risk takers
- personal risk taking
- nature of risks
- techniques of evaluating risks
- coping with risks/risk management

14.1.8.5.T6 Time Management

- time consciousness
- time scheduling
 - prioritization
 - keeping to specifics
 - overtime

14.1.8.5.T7 Leadership styles/image

- behaviour and character
- leading and motivating others

14.1.8.6T ENTERPRISE MANAGEMENT

THEORY

14.1.8.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) evaluate business goals
- b) analyze the efficiency or resource utilization

- c) plan the finances of business
- d) manage production effectively
- e) manage human resources in a business
- f) use simple techniques of work study to optimize production
- g) market a product/service effectively
- h) explain the role of a public relations office in the marketing campaigns or a business
- i) acquire/mange information relevant for starting and operating a business
- j) determine the viability of an investment project

CONTENT

- 14.1.8.6.T1** Evaluation of goals
 - identification of goals
 - comparison of actual verses planned
 - causes of deviation
 - adjustments
- 14.1.8.6.T2** Efficiency of resource utilization
 - productivity
 - degree of utilization
 - waste management
 - recycling feasibility
- 14.1.8.6.T3** Planning of business finance
 - cash flow
 - budgeting
 - performance report
- 14.1.8.6.T4** Production management
 - operation schedule
 - materials requirements forecasts
 - stock inventory and stock levels
 - quality control
 - waste control
 - maintenance
- 14.1.8.6.T5** Management of human resources
 - interview and recruitment
 - staff development programs
 - human relations and communication
 - good working environment
- 14.1.8.6.T6** Work Study
 - purpose of work study

- techniques
 - basic Procedures
- 14.1.8.6.T7** Marketing
- purpose/importance of service/product marketing
 - marketing mix
 - product/service
 - price
 - places (s) of distribution
 - promotion tools
- 14.1.8.6.T8** Public relations
- purpose
 - methods/tools
 - PR budget
 - benefits versus cost
- 14.1.8.6.T9** Information management
- collection
 - processing
 - analysis
 - storage
 - retrieval
 - importance of information for business
- 14.1.8.6.T10** Determination of project viability
- feasibility study
 - planning
 - business
 - project implementation
 - project evaluation
 - cost-benefit analysis

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- www contents
- Resource persons

ASSESSMENT MODE

- Written tests
- Orals tests

MODULE 2

By the end of this module unit, the trainee should be able to perform system analysis, utilise computer application and design and develop simple application

Topics

1. Research Project
2. System Analysis and Design
3. Object Oriented Programming
4. Database Management Systems
5. Computer Applications II
6. Visual Programming

15.2.1. RESEARCH PROJECT

15.2.1.01 INTRODUCTION

This course unit is intended to expose trainee to the practical experience in project planning and execution whereBy thetrainee are expected to plan, gather, review and present project materials and information in accordance with given specifications.

15.2.1.02 GENERAL OBJECTIVES

At the end of this course unit, the trainee should be able to:

- a) understand the scope and challenges involved in carrying out a given project.
- b) understand the various methodologies that can be applied in data collection for different types of projects
- c) analyze/interpret project data and made conclusion based on the subject matter of the project.
- d) present project report in an organized manner, taking into consideration quality of materials, neatness and the standard format (s).

15.2.1.03 SUBJECT SUMMARY AND TIME ALLOCATION

CODE	TOPIC	SUB-TOPIC	TIME
15.2.1.1	INTRODUCTION TO PROJECT WORK	<ul style="list-style-type: none">• meaning of projects• importance of projects	2
15.2.1.2	PROJECT PROPOSAL	<ul style="list-style-type: none">• selection of a project• project objectives]• importance of project proposal• preparation of a project proposal	14
15.2.1.3	METHODOLOGIES	<ul style="list-style-type: none">• sampling• instruments for data collection• data collection procedure	20
15.2.1.4	ANALYSIS	<ul style="list-style-type: none">• methods of data analysis (methods of analyzing data)	5
15.2.1.5	PRESENTATION	<ul style="list-style-type: none">• display of product• project report writing	9
TOTAL			50

15.2.1.1T INTRODUCTION TO PROJECT WORK

THEORY

15.2.1.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of project
- b) explain the importance of a project

CONTENT

15.2.1.1.T1 Meaning of project

15.2.1.1.T2 Purpose of a project

15.2.1.2T PROJECT PROPOSAL

THEORY

15.2.1.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe each of the types of projects
- b) explain the main factors to consider when selecting a project
- c) formulate project activities
- d) explain the importance of a project proposal

CONTENT

15.2.1.2.T1 Types of projects

- practical
- mathematical
- evaluative
- research

15.2.1.2.T2 Factors to consider in selecting a project

- types of project
- quality specifications
- availability appropriate technology (materials and equipment)
- personnel required
- time factor
- finance available

15.2.1.2.T3 Formulation to project objectives

15.2.1.2.T4 Importance of a project proposal

- introduction

- objectives
- available information (literature review)
- methodology
- analysis
- budgeting
- timing

15.2.1.3T METHODOLOGIES

THEORY

15.2.1.3.T0 Specific Objectives

By the end of this topic, the trainee should be able to

- a) explain how to take a representative sample of a specified population
- b) select and use appropriate instruments to collect relevant data
- c) identify an appropriate procedure of carrying out a given type of project

CONTENT

15.2.1.3.T1 Taking a representative sample

- means of representative sample
- methods of sampling

15.2.1.3.T2 Instruments for collecting data

- types of instruments
 - social science research instruments
 - questionnaires
 - observation schedules
 - industrial and scientific research instruments
 - machines
 - hand tools and aids
- types of data
 - dimensional measurements
 - statistical data
 - diagrammatic and photographic data
 - field notes, reports and descriptive data
 -
- methods of data collection
 - observation
 - interview
 - measurements
 - photography
 - counting

15.2.1.3.T3 Procedures of carrying out a type of project

- practical

- mathematical
- evaluative
- research based

15.2.1.4T ANALYSIS

THEORY

15.2.1.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) analyze and interpret project data

CONTENT

15.2.1.4.T1 Methods of analyzing and interpreting project data

- computation
- comparison
- interpretation
- drawing conclusions

15.2.1.5T PRESENTATION

THEORY

15.2.1.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) write the report of his/her project
- b) make a presentation of his/her project work

CONTENT

15.2.1.5.T1 Presentation

- order of presentation
 - flow of ideas/content
 - communication style
 - appropriate product display method

15.2.1.5.T2 Project report writing

- format
- element

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- www contents
- Resource persons

ASSESSMENT MODE

- Written tests
- Project report writing
- Oral tests

16.2.2. SYSTEMS ANALYSIS AND DESIGN – (160 HOURS)

16.2.2.01 INTRODUCTION

This module unit is intended to equip the trainee with the knowledge, skills and attitudes to enable him/her to undertake systems analysis and design.

16.2.2.02 GENERAL OBJECTIVES

By the end of this module unit, the trainee should be able to:

- a) understand systems concepts
- b) understand systems analysis and design phases
- c) use systems analysis design tools and techniques
- d) apply systems development methodologies
- e) apply information system project management skills

16.2.2.03 COURSE SUMMARY AND TIME ALLOCATION: 160 HOURS

CODE	TOPIC	SUB-TOPIC	HOURS T P	HOURS
16.2.2.1	INTRODUCTION TO SYSTEMS ANALYSIS AND DESIGN	<ul style="list-style-type: none">• meaning of system analysis and design<ul style="list-style-type: none">- system- information system- information technology• components of an information system• types of information system<ul style="list-style-type: none">- TPS- DSS- OAS- GSS- ELS- Others• roles of information system stake holders	6	6
16.2.2.2	SYSTEMS THEORY	<ul style="list-style-type: none">• systems theory concepts• components of a system• types of systems• system properties	4	4
16.2.2.3	SYSTEMS DEVELOPMENT LIFE CYCLE (SDLC)	<ul style="list-style-type: none">• meaning of SDLC• SDLC stages	10	10

CODE	TOPIC	SUB-TOPIC	HOURS T P	HOURS
16.2.2.4	PROBLEM DEFINITION	<ul style="list-style-type: none"> • problem definition • indicators of problems • methods of identifying the problem • contents of TOR 	2 2	4
16.2.2.5	FEASIBILITY STUDY	<ul style="list-style-type: none"> • types of feasibility <ul style="list-style-type: none"> - economic - technical - social/behavioral - legal - schedule - operational • fact finding methods • feasibility study report 	4 6	10
16.2.2.6	SYSTEM ANALYSIS	<ul style="list-style-type: none"> • meaning and importance of systems analysis • methods in systems analysis <ul style="list-style-type: none"> - structured - prototyping • tools <ul style="list-style-type: none"> - DFD'S - flowcharts - data dictionary - ELH - others 	10 14	24
16.2.2.7	SYSTEMS DESIGN AND DEVELOPMENT	<ul style="list-style-type: none"> • meaning and importance of system design • qualities of a good design • system design models • system components tools • design tools • system development methodologies • system design methods • criteria for choosing a system development methodology 	24 12	36

CODE	TOPIC	SUB-TOPIC	HOURS T P	HOURS
16.2.2.8	IMPLEMENTATION	<ul style="list-style-type: none"> • meaning and importance of system implementation • procedures of system implementation • system implementation techniques • testing techniques • levels of acceptance testing • user training 	14	14
16.2.2.9	MAINTENANCE AND REVIEW	<ul style="list-style-type: none"> • meaning of system maintenance and review • importance of maintenance • types of system maintenance 	2	2
16.2.2.10	SYSTEM DOCUMENTATION	<ul style="list-style-type: none"> • meaning of document • need for documentation • types of documentation 	6	6
16.2.2.11	SYSTEM ACQUISITION	<ul style="list-style-type: none"> • Information system acquisition methods • criteria for choosing an information system acquisition method 	4	4
16.2.2.12	ICT PROJECT MANAGEMENT	<ul style="list-style-type: none"> • meaning and importance of ICT project management • ICT project management tools • criteria for evaluating ICT projects • signs of a failing ICT project • reasons for ICT project failure • strategies for managing a failing ICT project 	30	30
16.2.2.13	EMERGING TRENDS IN SAD	<ul style="list-style-type: none"> • emerging trends in SAD • challenges of emerging trends in SAD 	2	2

16.2.2.1T INTRODUCTION TO SYSTEMS ANALYSIS AND DESIGN

THEORY

16.2.2.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain meaning of SAD
- b) describe the components of an information system
- c) describe the roles of information systems stake holders
- d) describe the types of information systems

CONTENT

16.2.2.1.T1 Meaning of terms:

- system
- information
- information system
- information technology

16.2.2.1.T2 Components of an information system

16.2.2.1.T3 Types of information systems

- Transaction processing systems
- Management information systems
- Decision support systems
- Expert systems
- Office automation systems
- Others

16.2.2.1.T4 Roles of information systems stake holders

- systems owners
- systems users
- systems analyst
- systems designers
- systems developer
- other

16.2.2.2T SYSTEMS THEORY/CONCEPT

THEORY

16.2.2.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain systems concept
- b) describe the components of a system
- c) describe the classification of systems
- d) explain system properties
- e) describe the types of systems

CONTENT

16.2.2.2.T1 Systems theory/concept explained

16.2.2.2.T2 Components/elements of a system

- input
- processing
- output

16.2.2.2.T3 Types of systems

- man made
- automated

16.2.2.2.T4 Classification of systems

- open Vs closed
- adaptive
- deterministic
- probabilistic

16.2.2.2.T5 Classification of properties

- hard properties
- soft properties

16.2.2.3T SYSTEMS DEVELOPMENT LIFE CYCLE (SDLC)

THEORY

16.2.2.3.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of SDLC
- b) describe SDLC stages

CONTENT

16.2.2.3.T1 Meaning of SDLC

16.2.2.3.T2 SDLC stages

- problem definition
- feasibility study
- systems analysis
- systems design and development
- implementation
- maintenance and review

16.2.2.4T PROBLEM DEFINITION

THEORY

16.2.2.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) identify problem indicators
- b) describe the contents of a TOR

CONTENT

16.2.2.4.T1 Problem Indicators

16.2.2.4.T2 Contents of a TOR

PRACTICE

16.2.2.4.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) formulate an IS problem statement
- b) prepare a TOR

CONTENT

16.2.2.4.P1 Trainee to formulate information system problem statement

16.2.2.4.P2 Trainee to prepare a TOR based on an IS problem statement

16.2.2.5T FEASIBILITY STUDY

THEORY

16.2.2.5.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) describe the types of feasibility
- b) describe fact finding methods
- c) describe data gathering tools

CONTENT

16.2.2.5.T1 Types of feasibility

- economic
- technical
- operational
- legal

16.2.2.5.T2 Fact finding methods

16.2.2.5.T3 Data gathering tools

PRACTICE

16.2.2.5.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) design data gathering tools
- b) prepare a feasibility report

CONTENT

16.2.2.5.P1 Groups to design data gathering tools

- questionnaire

16.2.2.5.P2 Groups to prepare feasibility report

16.2.2.6T SYSTEMS ANALYSIS

THEORY

16.2.2.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of systems analysis
- b) describe systems analysis approaches/methods
- c) describe systems analysis tools

CONTENT

16.2.2.6.T1 Meaning and importance of systems analysis

16.2.2.6.T2 Systems analysis approaches/methods

- move-driven
- structured
- photocopying (discovery photo copying)

16.2.2.6.T3 Applying systems analysis tools

- flow charts
- DFDS
- data dictionary
- ELITS
- Others

PRACTICE

16.2.2.6.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) apply systems analysis tools

CONTENT

16.2.2.6.P1 Analysis tools

16.2.2.7T SYSTEMS DESIGN AND DEVELOPMENT

THEORY

16.2.2.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of system design
- b) explain qualities
- c) describe system design models
- d) describe systems component design
- e) describe system design tools
- f) describe system development methodologies
- g) describe system design methods
- h) explain the criteria for choosing system development methodologies

CONTENT

16.2.2.7.T1 Meaning and importance of system design

16.2.2.7.T2 Qualities of a good system design

16.2.2.7.T3 System design models

- logical
- physical

16.2.2.7.T4 System design components

- input
- process
- reports
- code design
- database
- file design

16.2.2.7.T5 System design tools

- decision tables
- structured English
- ERDS
- structured charts
- others

- 16.2.2.7.T6** System development methodologies
- structured
 - traditional
 - object oriented
- 16.2.2.7.T7** system design methods
- photocopying
 - JSD
 - SSDAM
 - functional decomposition
- 16.2.2.7.T8** Criteria for choosing system development methodologies

PRACTICE

- 16.2.2.7.P0** Specific Objectives
- By the end of this topic, the trainee should be able to:
- a) develop a physical system model
 - b) develop a logical system model
 - c) use design tools
 - d) prepare system specifications

CONTENT

- 16.2.2.7.P1** Physical design model
- 16.2.2.7.P2** Logical design model
- 16.2.2.7.P3** Design tools
- 16.2.2.7.P4** System specifications

16.2.2.8T SYSTEM IMPLEMENTATION

THEORY

- 16.2.2.8.T0** Specific Objectives
- By the end of this topic, the trainee should be able to:
- a) explain the meaning and importance of system implementation
 - b) explain procedures of system implementation
 - c) describe system implementation techniques
 - d) describe system testing techniques
 - e) explain the levels of acceptance testing
 - f) explain the need for user training
 - g) explain the methods of user training
 - h) describe types of users to be trained

CONTENT

- 16.2.2.8.T1 Meaning and importance of system implementation
- 16.2.2.8.T2 Procedure of system implementation
- 16.2.2.8.T3 System implementation techniques
- 16.2.2.8.T4 System testing and techniques
- 16.2.2.8.T5 Levels of acceptance testing
- 16.2.2.8.T6 Need for user training
- 16.2.2.8.T7 Methods of user training
- 16.2.2.8.T8 Types of users to be trained

16.2.2.9T SYSTEM MAINTENANCE AND REVIEW

THEORY

16.2.2.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of system maintenance and review
- b) explain the importance of system maintenance
- c) describe the types of system maintenance

CONTENT

- 16.2.2.9.T1 Meaning and importance of system maintenance and review
- 16.2.2.9.T2 Importance of system maintenance
- 16.2.2.9.T3 Types of system maintenance

16.2.2.10T SYSTEM DOCUMENTATION

THEORY

16.2.2.10.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of system documentation
- b) explain the need for system documentation
- c) describe the types of system documentation

CONTENT

- 16.2.2.10.T1 Meaning of system documentation
- 16.2.2.10.T2 Need for system documentation

16.2.2.10.T3 Types of system documentation

16.2.2.11T SYSTEM ACQUISITION

THEORY

16.2.2.11.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe information system acquisition methods
- b) explain the criteria for choosing an information system acquisition method

CONTENT

16.2.2.11.T1 Information system acquisition methods

16.2.2.11.T2 Criteria for choosing an information system acquisition methods

16.2.2.12T ICT PROJECT MANAGEMENT

THEORY

16.2.2.12.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of ICT project management
- b) describe ICT project management tools
- c) explain the criteria for evaluating ICT projects
- d) explain the signs of a failing ICT project
- e) explain the reasons for ICT project failure
- f) explain the strategies for managing a failing ICT project

CONTENT

16.2.2.12.T1 Meaning and importance of ICT project management

16.2.2.12.T2 ICT project management tools

16.2.2.12.T3 Criteria for evaluation ICT projects

16.2.2.12.T4 Signs of a failing ICT project

16.2.2.12.T5 Reasons for ICT project failure

16.2.2.12.T6 Strategies for managing a failing ICT project

16.2.2.13T EMERGING TRENDS IN SAD

THEORY

16.2.2.13.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) identify emerging trends in SAD
- b) explain the challenges of emerging trends in SAD
- c) cope with the challenges of emerging trends

CONTENT

16.2.2.13.T1 Emerging trends in SAD

16.2.2.13.T2 Challenges of emerging trends in SAD

16.2.2.13.T3 Cope with the challenges of emerging trends in SAD

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- www contents
- Resource persons

ASSESSMENT MODE

- Written tests
- Project report writing
- Oral tests

17.2.3. OBJECT ORIENTED PROGRAMMING (90 HOURS)

17.2.3.01 INTRODUCTION

This module unit is intended to provide the trainee with knowledge and skills to develop programs in Object Oriented Languages.

17.2.3.02 GENERAL OBJECTIVES

By the end of this module unit the trainee should be able to:

- a) understand the various data types, control structures and data structures used in object oriented programming
- b) apply programming skills in C++
- c) develop object oriented programs

17.2.3.03 COURSE SUMMARY AND TIME ALLOCATION

NB: APPROPRIATE TEACHING LANGUAGES - C++

CODE	TOPIC	SUBTOPIC	HOURS T P	TOTAL
17.2.3.1	INTRODUCTION TO OBJECT ORIENTED PROGRAMMING	<ul style="list-style-type: none">• object oriented programming• evolution of object oriented programming• OOP paradigms• merits and demerits of OOP• examples of object oriented languages• operating systems requirements• object oriented databases (OODBs)	4	4
17.2.3.2	OOP CONCEPTS	<ul style="list-style-type: none">• concepts associated with OOP• comparison between structured and OOP• reasons for embracing OOP	8	8

CODE	TOPIC	SUBTOPIC	HOURS T P	TOTAL
17.2.3.3	LANGUAGE STRUCTURES OF OBJECT ORIENTED PROGRAMMING (OOP)	<ul style="list-style-type: none"> • language structure • Features of OOP languages • File extensions in OOP • data types in OOP • variable declaration • implementation of language structure 	4 12	16
17.2.3.4	ESSENCE OF OBJECTS AND CLASSES	<ul style="list-style-type: none"> • definition of objects and classes in OOP • importance of objects and classes in OOP • implementation of objects and classes 	6 13	19
17.2.3.5	INHERITANCE	<ul style="list-style-type: none"> • meaning and importance • rules of inheritance in OOP • types of inheritance in OOP • implementation of inheritance 	2 6	8
17.2.3.6	POLYMORPHISM	<ul style="list-style-type: none"> • meaning and importance of polymorphism • encapsulation/information Hiding • implementation of polymorphism 	2 6	8
17.2.3.7	CONSTRUCTORS AND DESTRUCTORS	<ul style="list-style-type: none"> • meaning of constructors • constructor implementation 	2 8	10
17.2.3.8	OPERATOR OVERLOADING	<ul style="list-style-type: none"> • meaning and importance of operator overloading • implementation of operator overloading 	2 8	10
17.2.3.9	FILE ORGANISATION	<ul style="list-style-type: none"> • meaning and importance of file organization • file stream • file stream features/properties • file operations 	2 2	4

CODE	TOPIC	SUBTOPIC	HOURS		TOTAL
			T	P	
17.2.3.10	EMERGING TRENDS IN OBJECT ORIENTED PROGRAMMING	<ul style="list-style-type: none"> • emerging trends in OOP • challenges of emerging trends in OOP • coping with challenges of emerging trends in OOP 	2	2	2

17.2.3.1T INTRODUCTION TO OBJECT ORIENTED PROGRAMMING

THEORY

17.2.3.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define Object Oriented Programming
- b) trace the evolution of Object Oriented Programming
- c) describe the different programming paradigms
- d) explain the merits and demerits of OOP
- e) describe operating systems requirements for OOP
- f) identify example of Object Oriented Programming languages
- g) describe Object Oriented Databases (OODBs)

CONTENT

17.2.3.1.T1 Definition of Object Oriented Programming

17.2.3.1.T2 Evolution of object oriented programming

17.2.3.1.T3 Programming paradigms

- unstructured programming
- procedural programming
- modular programming
- object oriented programming

17.2.3.1.T4 Merits and demerits of OOP

17.2.3.1.T5 Operating system requirements

17.2.3.1.T6 Examples of object oriented languages

- C++
- java
- others

- 17.2.3.1.T7** Object Oriented Databases (OODBs)
- hybrid object oriented databases
 - persistent object oriented databases
 - pure object oriented databases

17.2.3.2T OBJECT ORIENTED PROGRAMMING CONCEPTS

THEORY

17.2.3.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain OOP concepts
- b) compare structured Vs OOP
- c) explain the reasons for embracing OOP

CONTENT

17.2.3.2.T1 Concepts associated with OOP

- class
- object
- relationship
- inheritance
- polymorphism
- encapsulation

17.2.3.2.T2 Comparison between structured and OOP

- keywords and identifiers
- comments
- literals
- constants
- punctuators

17.2.3.2.T3 Reasons for embracing OOP

17.2.3.3T LANGUAGE STRUCTURES OF OBJECT ORIENTED PROGRAMMING (OOP)

17.2.3.3.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe language structure
- b) describe the features of OOP languages
- c) identify file extensions in OOP

- d) describe data types in OOP
- e) describe variable declarations

CONTENT

- 17.2.3.3.T1** Language structure
- 17.2.3.3.T2** Features of OOP languages
- 17.2.3.3.T3** File extensions in OOP
- 17.2.3.3.T4** Data Types in OOP
 - simple data type
 - derived types
 - pointers
 - reference
 - arrays
 - structures
 - functions
 - class types
- 17.2.3.3.T5** Variable declaration
 - declaration syntax
 - initialization
 - data conversion
 - scope of variables
 - type conversion
 - explicit type checking

PRACTICE

17.2.3.3.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) implement language structure in C++

17.2.3.3.P1 Implementing language structure in C++

- declarations
- operators
- extensions
- statements

CONTENT

17.2.3.3.P2 Implement language structure in specific OOP language

- declarations
- operators
- extensions
- statements

17.2.3.4T ESSENCE OF OBJECTS AND CLASSES

THEORY

17.2.3.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain objects and classes in OOP
- b) explain importance of objects and classes in OOP

CONTENT

17.2.3.4.T1 Objects and classes in OOP

17.2.3.4.T2 Importance of objects and classes in OOP

17.2.3.4.T3 Implementation of objects and classes

- initialization
- free store
- static objects
- implicit pointer
- in-line function
- friend of class
- static class members
- specifiers – const, enum, typedef
- enumerated constant
- pointer to members
- nested classes
- container class libraries

PRACTICE

17.2.3.4.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) implement object and classes using C++

CONTENT

17.2.3.4.P1 Implementation of objects and objects using C++

- initialization
- free store
- static objects
- implicit pointer
- in-hire function etc

17.2.3.5T INHERITANCE

THEORY

17.2.3.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the importance of inheritance
- b) describe the rules of inheritance in OOP
- c) describe the types of inheritance in OOP
- d) implement inheritance

CONTENT

17.2.3.5.T1 Meaning and importance of inheritance

17.2.3.5.T2 Rules of inheritance in OOP

17.2.3.5.T3 Types of inheritance in OOP

PRACTICE

17.2.3.5.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) implement inheritance

CONTENT

17.2.3.5.P1 Implementation of inheritance

- derived classes
- inheritance and friends
- pointers to objects
- inheritance and constructors
- inheritance and destructors
- order of constructor invocation
- multiple inheritance
- base class conversions
- standard conversions
- user-defined conversions
- inheritance and class scope
- inheritance and overloading
- inheritance relationship

17.2.3.6T POLYMORPHISM

THEORY

17.2.3.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain meaning and importance of polymorphism
- b) explain encapsulation / information hiding

CONTENT

17.2.3.6.T1 Meaning importance of polymorphism

17.2.3.6.T2 Encapsulation / Information hiding

- virtual functions & abstract classes
- ambiguity
- virtual base class

PRACTICE

17.2.3.6.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) implement polymorphism

CONTENT

17.2.3.6.P1 Implement polymorphism

- virtual functions & abstract classes
- ambiguity
- virtual base class

17.2.3.7T CONSTRUCTORS AND DESTRUCTORS

THEORY

17.2.3.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of constructors and destructors

CONTENT

17.2.3.7.T1 Meaning and importance of constructors and destructors

- default constructors
- copy constructors
- argument matching
- destructors
- overloading& scope

PRACTICE

17.2.3.7.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) implement constructors

17.2.3.7.P1 Implementation of constructors

- default constructors
- copy constructors
- argument matching
- overloading & scope

17.2.3.7.P2 Implementation of destructors

17.2.3.8T OPERATOR OVERLOADING

THEORY

17.2.3.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) meaning and importance of operator overloading

CONTENT

17.2.3.8.T1 Meaning and importance of operator overloading

PRACTICE

17.2.3.8.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) a) implement operator overloading

CONTENT

17.2.3.8.P1 Implement operator overloading

- expression
- binary and unary operators
- operator function
- over loadable operators
- rules
- predefined meaning for operators
- operators new and delete
- conversion operators
- ambiguities
- subscripting, function call & dereferencing

- subscript
- function call
- dereferencing
- friend operators

17.2.3.9T FILE ORGANISATION

THEORY

17.2.3.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of file organization
- b) describe file stream
- c) describe file stream features / properties
- d) implement file operation

CONTENT

17.2.3.9.T1 Description of file organization

- file input / output

17.2.3.9.T2 Description of File Stream

- file stream Input/Output

17.2.3.9.T3 File Stream features/properties

- stream class hierarchy
- reference
- member functions
- istream class
- ostream class

PRACTICE

17.2.3.9.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) implement file operations

CONTENT

17.2.3.9.P1 Implementing file operations

- record appending
- record insertion
- record modification
- record deletion

17.2.3.10T EMERGING TRENDS IN OBJECT ORIENTED PROGRAMMING

THEORY

17.2.3.10.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) identify emerging trends in OOP
- b) explain the challenges of emerging trends in OOP
- c) cope with the challenges of emerging trends in OOP

CONTENT

17.2.3.10.T1 Emerging trends in OOP

17.2.3.10.T2 Challenges of emerging trends in OOP

17.2.3.10.T3 Coping with challenges in OOP

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- www contents
- Sample codes from www contents
- OOP languages

ASSESSMENT MODE

- Written tests
- Practical tests
- Program project development using OOP concepts in programming
- Oral tests

18.2.4. VISUAL PROGRAMMING (190 HOURS)

18.2.4.01 INTRODUCTION

This module unit is intended to provide the trainee with knowledge and skills to develop programs in visual programming Languages.

18.2.4.02 GENERAL OBJECTIVES

By the end of this module unit the trainee should be able to:

- a) apply programming skills in visual basic
- b) understand the various data types, control structures and data structures used in object oriented programming
- c) develop object oriented programs

18.2.4.03 VISUAL PROGRAMMING

NB: APPROPRIATE TEACHING LANGUAGES - VISUAL BASIC

CODE	TOPIC	SUBTOPIC	HOURS T P	TOTAL
18.2.4.1	INTRODUCTION TO VISUAL PROGRAMMING LANGUAGES	<ul style="list-style-type: none"> • visual programming • example of visual programming languages • hardware and software considerations for visual programming 	4	4
18.2.4.2	VISUAL ENVIRONMENT	<ul style="list-style-type: none"> • description of visual environment • integrated development environment • visual objects 	4 8	12
18.2.4.3	PROGRAM STRUCTURE	<ul style="list-style-type: none"> • format of a visual program • data types • operators • variables 	4 4	4
18.2.4.4	PROGRAM WRITING	<ul style="list-style-type: none"> • creating an application • compilation • debugging • testing • execution 	2 14	16
18.2.4.5	CONTROL STRUCTURES	<ul style="list-style-type: none"> • types of control structure • implementation of control structures 	2 8	10
18.2.4.6	ERROR HANDLING	<ul style="list-style-type: none"> • types of errors • error handling techniques 	2 6	8
18.2.4.7	SUB-PROGRAMS	<ul style="list-style-type: none"> • meaning of subprograms • types of subprograms • scope of variables 	4 6	10
18.2.4.8	DATA STRUCTURES	<ul style="list-style-type: none"> • data structures • types of data structures • sort techniques • search techniques 	4 10	13
18.2.4.9	LINKING TO DATABASES	<ul style="list-style-type: none"> • database controls • reports 	8 12	20

CODE	TOPIC	SUBTOPIC	HOURS T P	TOTAL
18.2.4.10	EMERGING TRENDS IN VISUAL PROGRAMMING	<ul style="list-style-type: none"> • emerging trends in visual programming • challenges of emerging trends in visual programming 	2 2	2

18.2.4.1T INTRODUCTION TO VISUAL PROGRAMMING LANGUAGES

THEORY

18.2.4.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- describe visual programming
- identify different examples of visual programming languages
- describe hardware and software considerations for visual programming

CONTENT

18.2.4.1.T1 Description of Visual programming

18.2.4.1.T2 Example of Visual programming languages

- Visual basic
- Visual C++
- Delphi

18.2.4.1.T3 Hardware and software considerations for visual programming

18.2.4.2T VISUAL ENVIRONMENT

THEORY

18.2.4.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- describe visual environment
- describe integrated development environment
- describe various Visual objects

CONTENT

- 18.2.4.2.T1** Description of Visual Environment
- event driven environment
- 18.2.4.2.T2** Description of Integrated development environment
- 18.2.4.2.T3** Visual objects
- types of controls
 - form window
 - properties window
 - immediate window
 - code window
 - others

PRACTICE

- 18.2.4.2.P0** **Specific Objectives**
- By the end of this topic, the trainee should be able to:
- a) create visual environment with object

CONTENT

- 18.2.4.2.P1** Creating visual environment

18.2.4.3T PROGRAM STRUCTURE

THEORY

- 18.2.4.3.T0** **Specific Objectives**
- By the end of this topic, the trainee should be able to:
- a) describe format of a visual program
 - b) explain different data types
 - c) explain various data operators
 - d) explain variable declaration

CONTENT

- 18.2.4.3.T1** Format of a visual program
- 18.2.4.3.T2** Data types
- 18.2.4.3.T3** Data operators
- arithmetic
 - logical
 - comparison
 - others

18.2.4.3.T4 Variable declaration

18.2.4.4T PROGRAM WRITING

THEORY

18.2.4.4.T0 **Specific Objectives**

By the of this topic, the trainee should be able to:

- a) define program writing terminologies

CONTENT

18.2.4.4.T1 Defining program writing terminologies

PRACTICE

18.2.4.4.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) build a program
- b) compile a program
- c) debug a program
- d) execute a program in visual basic

18.2.4.4.P1 Building programs

18.2.4.4.P2 Compilation

18.2.4.4.P3 Debugging

18.2.4.4.P4 Execution

18.2.4.5T CONTROL STRUCTURES

THEORY

18.2.4.5.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) explain control structures
- b) describe different types of control structures
- c) implement control structure

CONTENT

18.2.4.5.T1 Definition of control structures

18.2.4.5.T2 Types of Control structure

- sequence
- selection
- iteration/repetition

PRACTICE

18.2.4.5.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) implement control structure

CONTENT

18.2.4.5.P1 Implementation of control structures

18.2.4.6T **ERROR HANDLING**

THEORY

18.2.4.6.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) identify different types of errors
- b) describe error handling techniques

CONTENT

18.2.4.6.T1 Types of errors

- syntax
- run time
- semantics
- logical

18.2.4.6.T2 Error handling techniques

- writing error handlers
 - on error go to
 - on error resume
 - err object
- debugging tools

18.2.4.7T SUB-PROGRAMS

THEORY

18.2.4.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe sub-programs
- b) describe various types of subprograms
- c) describe the scope of variables

CONTENT

18.2.4.7.T1 Description of Sub-programs

18.2.4.7.T2 Types of Sub-programs

- private sub-programs
- public sub-programs

18.2.4.7.T3 Scope of variables

- local variables
- global variables

PRACTICE

18.2.4.7.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) write a sub-program

CONTENT

18.2.4.7.P1 Writing sub-programmes

18.2.4.8T DATA STRUCTURES

THEORY

18.2.4.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of data structures
- b) describe different types of data structures
- c) describe various sort techniques
- d) describe various search techniques

CONTENT

18.2.4.8.T1 Description of data structures

18.2.4.8.T2 Types of data structures

- arrays

- one dimensional
- two dimensional

18.2.4.8.T3 Sort techniques

- bubble
- shell

18.2.4.8.T4 Search techniques

- binary search

PRACTICE

18.2.4.8.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) implement data structures
- b) implement search and sort techniques

CONTENT

18.2.4.8.P1 Implementing data structure

18.2.4.8.P2 Implementing search and sort techniques

18.2.4.9T **LINKING TO DATABASES**

THEORY

18.2.4.9.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) apply database controls
- b) create reports

CONTENT

18.2.4.9.T1 Database controls

- Data Control
- MS Data bound Controls
- Active Data Object(ADO)

18.2.4.9.T2 Reports

- data report

PRACTICE

18.2.4.9.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) apply database controls
- b) create data report

CONTENT

18.2.4.9.P1 Applying database control

18.2.4.9.P2 Creating data report

18.2.4.10T EMERGING TRENDS IN VISUAL PROGRAMMING

THEORY

18.2.4.10.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) identify emerging trends in visual programming
- b) describe challenges of emerging trends in visual programming
- c) cope with challenges of emerging trends in visual programming

CONTENT

18.2.4.10.T1 Emerging trends in visual programming

18.2.4.10.T2 Challenges of emerging trends in Visual programming

18.2.4.10.T3 Coping with challenges of emerging trends in visual programming

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- www contents
- Sample codes from www contents
- Visual programming languages

ASSESSMENT MODE

- Written tests
- Practical tests
- Program project development
- Oral tests

19.2.5. DATABASE MANAGEMENT SYSTEM (100 HOURS)

19.2.5.01 INTRODUCTION

This module unit is designed to equip the trainee with knowledge, skills and attitude that will enable him/her understand the construction and management of databases.

19.2.5.02 GENERAL OBJECTIVES

By the end of this module unit, the trainee should be able to:-

- a) appreciate database design and development
- b) understand the components of database management systems
- c) develop and manipulate a database

19.2.5.03 COURSE SUMMARY AND TIME ALLOCATION (100 HOURS)

CODE	TOPIC	SUB-TOPIC	TIME		
			T	P	TOTAL
19.2.5.1	INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS	<ul style="list-style-type: none"> • meaning of DBMS • historical evolution of DBMS • traditional vs. database approaches • components of a database management systems • classification of database system • advantages of DBMS • role of key players in database design and development 	18		18
19.2.5.2	DATABASE ORGANIZATION	<ul style="list-style-type: none"> • Meaning of database organisation • database organization approaches <ul style="list-style-type: none"> - distributed - centralized - client/server - database 	6		6
19.2.5.3	PRINCIPLES AND TECHNIQUES OF DATABASE DESIGN	<ul style="list-style-type: none"> • meaning • database design cycle 	8		8
19.2.5.4	RELATIONAL DATABASE SYSTEM	<ul style="list-style-type: none"> • meaning of relational database system • characteristics • relational algebra • relational calculus 	10		16
19.2.5.5	ENTITY RELATIONSHIP	<ul style="list-style-type: none"> • meaning of entity relationship • connotations of entity relationship • drawing ERDs 	2		8

CODE	TOPIC	SUB-TOPIC	TIME		
			T	P	TOTAL
19.2.5.6	NORMALIZATION	<ul style="list-style-type: none"> • meaning and importance of normalization • normalization rules • performing normalization 	10		14
19.2.5.7	QUERYING A DATABASE	<ul style="list-style-type: none"> • meaning of a database query • features • categories of SQL statements • design SQL statements • design SQL Queries • use of SQL statements to interrogate a database 	4	20	24
19.2.5.8	FUNCTION OF DATABASE MANAGEMENT SYSTEM	<ul style="list-style-type: none"> • meaning • transaction processing • concurrency controls • database recovery • database security and authorization 	4		4
19.2.5.9	EMERGING TRENDS	<ul style="list-style-type: none"> • emerging trends in database management system • challenges of emerging trends in database management system • coping with emerging trends in database management system 	2		2

19.2.5.1T INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

THEORY

19.2.5.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) meaning of database management system
- b) describe Components of databases
- c) trace the historical evolution of DBMS
- d) differentiate between traditional and database approach
- e) describe the advantages of DBMS
- f) classify database systems
- g) describe the role of key players in database design and development

CONTENT

- 19.2.5.1.T1** Meaning of database management system
- 19.2.5.1.T2** Components of databases
- 19.2.5.1.T3** Historical evolution of DBMS
- 19.2.5.1.T4** Traditional verses database approaches
- 19.2.5.1.T5** Advantages of DBMS
- 19.2.5.1.T6** Database systems
- 19.2.5.1.T7** Role of key players in database design and development

19.2.5.2T DATABASE ORGANISATION

THEORY

19.2.5.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning of database organisation
- b) describe database organization approaches

CONTENT

- 19.2.5.2.T1** Meaning of database organisation
- 19.2.5.2.T2** Describing database organisation approaches
 - distributed
 - centralized
 - client/server

19.2.5.3T PRINCIPLES AND TECHNIQUES OF DATABASE DESIGN

THEORY

19.2.5.3.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) describe the principles and techniques of database design
- b) describe database design cycle

CONTENT

19.2.5.3.T1 Principles and techniques of database design

19.2.5.3.T2 Database design cycle

19.2.5.4T RELATIONAL DATABASE SYSTEM

THEORY

19.2.5.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain meaning of relational database system
- b) explain the characteristics of a relational database system
- c) explain the relational algebra
- d) explain relational calculus

CONTENT

19.2.5.4.T1 Meaning of relational database system

19.2.5.4.T2 Characteristics of a relational database system

19.2.5.4.T3 Relational algebra

- meaning
- properties
- operations

19.2.5.4.T4 Meaning of relational calculus

PRACTICE

19.2.5.4.P0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) perform operations on relational algebra

19.2.5.4.P0 Performing relational algebra operations

19.2.5.5T ENTITY RELATIONSHIP

THEORY

19.2.5.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning of entity relationship
- b) describe the connotations of ER
- c) draw entity relationship diagrams

19.2.5.5.T1 Meaning of entity relationship

19.2.5.5.T2 Describing connotations of ER

PRACTICE

19.2.5.5.P0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) draw entity diagram

19.2.5.5.P1 Drawing entity diagram

19.2.5.6T NORMALIZATION

THEORY

19.2.5.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain meaning and importance of normalization
- b) describe normalization rules
- c) perform normalization

19.2.5.6.T1 Description of Normalization

19.2.5.6.T2 Importance of Normalization

19.2.5.6.T3 Normalization rules

- 1NF
- 2NF
- 3NF

PRACTICE

19.2.5.6.P0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) Perform normalization

19.2.5.6.P1 Performing normalization

19.2.5.7T QUERYING A DATABASE

THEORY

19.2.5.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) explain the meaning of a database query
- b) describe SQL Features
- c) identify the categories of SQL
- d) design SQL statement

CONTENT

19.2.5.7.T1 Meaning of a database query

19.2.5.7.T2 Features of SQL

19.2.5.7.T3 Categories of SQL

PRACTICE

19.2.5.7.P0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) design and use SQL statements to interrogate a database

CONTENT

19.2.5.7.P1 Designing and using statements to interrogate a database

19.2.5.8T FUNCTION OF DATABASE MANAGEMENT SYSTEMS

THEORY

19.2.5.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) a) explain the meaning and importance of database management systems

CONTENT

19.2.5.8.T1 Meaning and importance of database management systems

- transaction processing

- concurrency controls
- database recovery
- database security and authorization

19.2.5.9T EMERGING TRENDS

THEORY

19.2.5.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:-

- a) identify emerging trends in database management systems
- b) explain the challenges of emerging trends in database management systems
- c) cope with emerging trends in database management systems

CONTENT

19.2.5.9.T1 Identification of emerging trends in database management system

19.2.5.9.T2 Explaining the challenges of emerging trends in DBMS

19.2.5.9.T3 Coping with challenges of emerging trends in DBMS

TEACHING/LEARNING RESOURCES

- Relevant text books and free e-books
- www contents
- Appropriate DBMS software (MS access, Oracle 10g,
- Whiteboard
- Appropriate charts, pictures, clips

ASSESSMENT MODE

- Written tests
- Practical tests
- A Database Project
- Oral tests

21.2.6. COMPUTER APPLICATION II (120 HOURS)

20.2.6.01 INTRODUCTION

This module unit is designed to equip the trainee with knowledge, skills and attitude that will enable him/her use specialised computer application software.

20.2.6.02 GENERAL OBJECTIVES

By the end of this module unit, the trainee should be able to:

- a) use financial application software
- b) use project management software
- c) use computer aided design
- d) appreciate the use of geographical information systems
- e) appreciate the use of artificial intelligence

20.2.6.03 COURSE SUMMARY AND TIME ALLOCATION (120 HOURS)

CODE	TOPIC	SUB-TOPIC	TIME T P	TOTAL
20.2.6.1	FINANCIAL AP- PLICATIONS	<ul style="list-style-type: none"> • meaning and impor- tance of financial application • types of financial applications • features of financial applications • fundamentals of ac- counting • accounting and book keeping • accounting ledgers • practical applications 	20 40	60
20.2.6.2	COMPUTER AIDED DESIGN (CAD)	<ul style="list-style-type: none"> • meaning and impor- tance of CAD • fundamentals of Technical Drawing • features of CAD software • screen layout • commands used • configuration of CAD • practical applications 	10 30	40
20.2.6.3	GEOGRAPHICAL INFORMATION SYSTEM (GIS)	<ul style="list-style-type: none"> • meaning and impor- tance of GIS • components of GIS • application areas • others 	10 10	20
20.2.6.4	ARTIFICIAL IN- TELLIGENCE	<ul style="list-style-type: none"> • meaning and im- portance of artificial intelligence • categories of artificial intelligence • benefits and challenges of artificial intelligence • emerging trends in artificial intelligence 	40	40
TOTAL				120

20.2.6.1T FINANCIAL APPLICATIONS

THEORY

20.2.6.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe the fundamental of accounting
- b) distinguish between accounting and book-keeping
- c) describe the ledgers used in accounting

CONTENT

20.2.6.1.T1 Fundamentals of accounting

20.2.6.1.T2 Difference between accounting and book keeping

20.2.6.1.T3 Ledgers used in accounting

PRACTICE

20.2.6.1.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) apply various computerised financial systems

20.2.6.1.P1 Applying various computerised financial systems

- payroll systems
- inventory systems
- others

20.2.6.2T COMPUTER AIDED DESIGN (CAD)

THEORY

20.2.6.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of computer aided design
- b) explain the fundamentals of technical drawing
- c) describe the typical screen layout of a CAD system
- d) describe the features of a CAD system
- e) explain the advantages of a CAD system

CONTENT

- 20.2.6.2.T1 Meaning and importance of computer-aided design
- 20.2.6.2.T2 Fundamental of technical drawing
- 20.2.6.2.T3 Features of a CAD system
- 20.2.6.2.T4 Typical screen layout of a CAD system
- 20.2.6.2.T5 Advantages of a CAD system

PRACTICE

20.2.6.2.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) use the commands in a CAD system
- b) configure the CAD system

CONTENT

- 20.2.6.2.P1 Using commands in a CAD system
- 20.2.6.2.P2 Configuring the CAD system

20.2.6.3T GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

THEORY

20.2.6.3.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of GIS
- b) describe the components of a GIS

CONTENT

- 20.2.6.3.T1 Meaning and importance of GIS
- 20.2.6.3.T2 Components of a GIS

PRACTICE

20.2.6.3.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) apply GIS in various fields

20.2.6.3.P1 Applying GIS in various fields

- marketing
- security

- others

20.2.6.4T ARTIFICIAL INTELLIGENCE

THEORY

20.2.6.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- explain the meaning and importance of artificial intelligence
- describe the categories of artificial intelligence
- explain the benefits and challenges of artificial intelligence
- identify emerging trends in artificial intelligence

CONTENT

20.2.6.4.T1 Meaning and importance of artificial intelligence

20.2.6.4.T2 Categories of artificial intelligence

- robotics
- cognitive science
- natural interface applications
 - speech
 - voice recognition
 - virtual reality

20.2.6.4.T3 Benefits and challenges of artificial intelligence

20.2.6.4.T4 Emerging trends in artificial intelligence

TEACHING/LEARNING RESOURCES

- Computer
- Relevant application software
- Whiteboard
- Printers and Printing papers
- Relevant text books and free e-books
- Online content (www.howstuffworks.com, www.wikipedia.com...)

ASSESSMENT MODE

- Written Tests
- Practical tests
- Projects
- Oral test

MODULE 3

By the end of this module unit, the trainee should be able to perform network and system support duties

Topics

1. Networking and Data Communication
2. Management Information Systems
3. Principles of Management
4. Quantitative Techniques
5. Internet Based Programming
6. Business Plan

20.3.1. DATA COMMUNICATION AND NETWORKING (150 HOURS)

21.3.1.01: INTRODUCTION

This module unit is designed to equip the trainee with knowledge, skills and attitude that will enable him/her install and manage data communication networks

21.3.1.02: GENERAL OBJECTIVES

By the end of this module unit, the trainee should be able to:

- a) understand the concepts of data communications networks
- b) understand the use and application of different transmission media
- c) understand the various data transmission techniques
- d) appreciate the need for international standards
- e) use switching techniques in networking
- f) manage data communication networks
- g) appreciate the use and application of internet
- h) evaluate the performance of data communication network

21.3.1.03: COURSE SUMMARY AND TIME ALLOCATION (150 HOURS)

CODE	TOPIC	SUB-TOPIC	TIME		TOTAL HOURS
			T	P	
21.3.1.1	INTRODUCTION TO COMPUTER NETWORKS	<ul style="list-style-type: none">• meaning of computer network• components types of computer networks• types of computer network• role of computer networks• network topologies• categories of computer networks	1	2	3

CODE	TOPIC	SUB-TOPIC	TIME		TOTAL HOURS
			T	P	
21.3.1.2	NETWORK MEDIA	<ul style="list-style-type: none"> • meaning and importance of network media • types of transmission media • electrical properties of matter • types of wireless • network and topologies • advantages and disadvantages of different media and their application 	12		12
21.3.1.3	DATA COMMUNICATION	<ul style="list-style-type: none"> • meaning of data communication • principles of data communication • encoding techniques in data communication • networking models and their importance • OSI module and different layers • standards for internet networking component • as they map to OSI model • TCP model and functions • comparison of OSI and TCP models 	10		10
21.3.1.4	NETWORK CONNECTIONS AND PROTOCOLS	<ul style="list-style-type: none"> • transport protocols • others • network connectivity 	6		6
21.3.1.5	LOCAL AREA NETWORK	<ul style="list-style-type: none"> • meaning of LAN • LAN protocols and transmission methods • media access methods 	8		8
21.3.1.6	WIDE AREA NETWORK	<ul style="list-style-type: none"> • meaning of WAN • WAN protocols 	10		10
21.3.1.7	ETHERNET TECHNOLOGY	<ul style="list-style-type: none"> • meaning of ethernet • technology • ethernet standards 	6		6

CODE	TOPIC	SUB-TOPIC	TIME		TOTAL HOURS
			T	P	
21.3.1.8	NETWORK TROUBLE SHOOTING	<ul style="list-style-type: none"> • meaning and importance of trouble shooting • importance of network • troubleshooting • methods of troubleshooting 	6	2	8
21.3.1.9	NETWORK SECURITY	<ul style="list-style-type: none"> • meaning and importance of network security • network security • security techniques • security threats and • other network • vulnerabilities 	8	2	10
21.3.1.10	NETWORK DESIGNS	<ul style="list-style-type: none"> • meaning of network design • computer development • life cycle • hardware and software • requirement selective • set-up connection and • test • trouble shooting 	8	8	16
21.3.1.11	TCP/IP CONCEPTS	<ul style="list-style-type: none"> • meaning of concepts • types of data flow • use of IP addresses • testing of TCP/IP • configuration 	6	10	16
21.3.1.12	COMMUNICATION SOFTWARE	<ul style="list-style-type: none"> • meaning of communication • software • types of network • software • types of network • software 	8	2	10
21.3.1.13	INTERNET	<ul style="list-style-type: none"> • meaning and importance of internet • computer configuration • for internet usefile transfer • browsing internet 	4	14	18

CODE	TOPIC	SUB-TOPIC	TIME		TOTAL HOURS
			T	P	
21.3.1.14	EMERGING TRENDS	<ul style="list-style-type: none"> • emerging trends in networking • challenges of emerging trends • coping with challenges of emerging trend in networking 	8		8

21.3.1.1T DATA COMMUNICATION AND NETWORKING

THEORY

21.3.1.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of computer networks
- b) explain basic components of computer networks
- c) describe types of computer networks
- d) explain the role of computer networks
- e) describe network topologies
- f) describe categories of computer networks

CONTENT

- 21.3.1.1.T1 Meaning of computer network
- 21.3.1.1.T2 Components of computer network
- 21.3.1.1.T3 Types of computer networks
- 21.3.1.1.T4 Role of computer networks
- 21.3.1.1.T5 Network topologies
- 21.3.1.1.T6 Categories of computer networks

PRACTICE

21.3.1.1.P0 Specific Objectives

By the end of this topic the trainee should be able to:

- a) assemble network components

CONTENT

21.3.1.1.P1 Assembling network components

21.3.1.2T NETWORK MEDIA

THEORY

21.3.1.2.T0 20.3.2T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe electrical properties of matter
- b) explain the importance of different transmission media
- c) explain types of transmission media
- d) describe wireless network topologies
- e) explain the advantages/disadvantages of network media

CONTENT

21.3.1.2.T1 Electrical properties of matter

21.3.1.2.T2 Importance of different transmission media

21.3.1.2.T3 Types of transmission media

- bounded
- unbounded

21.3.1.2.T4 Describing wireless networks and topologies

21.3.1.2.T5 Explaining the advantages/disadvantages of different media

21.3.1.3T DATA COMMUNICATION

THEORY

21.3.1.3.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of data communication
- b) explain the principles of data communication
- c) explain techniques in data communication
- d) explain networking models and their importance
- e) describe the OSI model and different layers
- f) describe the standards for Ethernet
- g) describe networking components as they map to OSI models
- h) describe the TCP model and functions of different layers
- i) describe the comparison between OSI model and TCP model

CONTENT

- 21.3.1.3.T1 Meaning of data communication
- 21.3.1.3.T2 Principles of data communication
- 21.3.1.3.T3 Techniques in data communication
- 21.3.1.3.T4 Networking models and their importance
- 21.3.1.3.T5 OSI model and different layers
- 21.3.1.3.T6 Standards for Ethernet
- 21.3.1.3.T7 Networking components as they map to OSI models
 - NIC
 - HUB
 - SWITCH
 - ROUTER
- 21.3.1.3.T8 TCP models and functions of different layers
- 21.3.1.3.T9 Comparison between OSI model and TCP model

21.3.1.4T NETWORK CONNECTIONS AND PROTOCOLS

THEORY

21.3.1.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain transport protocols
- b) describe other protocols
- c) describe network connectivity

CONTENT

- 21.3.1.4.T1 Transport protocols
- 21.3.1.4.T2 Other protocols
 - RIP
 - BGP
 - OSPF
- 21.3.1.4.T3 Network connectivity
 - switch to switch
 - switch to computer

21.3.1.5T LOCAL AREA NETWORK

THEORY

21.3.1.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of local area network
- b) explain the LAN protocols and LAN transmission methods
- c) explain media access methods

CONTENT

21.3.1.5.T1 Meaning of local area network

21.3.1.5.T2 LAN protocols and LAN transmission methods

21.3.1.5.T3 Media access methods

- CSMA/CD
- Token

21.3.1.6T WIDE AREA NETWORK

THEORY

21.3.1.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of wide area networks
- b) explain the WAN protocols

CONTENT

21.3.1.6.T1 Meaning of wide (WAN)

21.3.1.6.T2 WAN protocols

- PPP
- FRAME RELAYS
- ISDN

21.3.1.7T ETHERNET TECHNOLOGY

THEORY

21.3.1.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of ethernet technology
- b) explain different Ethernet standards

CONTENT

21.3.1.7.T1 Ethernet technology

- 21.3.1.7.T2** Ethernet standards
- 10 base 2
 - 10 base 5
 - 10 baseT
 - 100 baseXX

21.3.1.8T NETWORK TROUBLE SHOOTING

THEORY

21.3.1.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain meaning and importance of network trouble shooting
- b) describe different methods of network trouble shooting

CONTENT

21.3.1.8.T1 Explaining the meaning and importance of network trouble shooting

21.3.1.8.T2 Describing different methods of network trouble shooting

- Echo
- Telnet

PRACTICE

21.3.1.8.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) apply trouble shooting techniques

CONTENT

21.3.1.8.P1 Applying trouble shooting techniques

21.3.1.9T NET WORK SECURITY

THEORY

21.3.1.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe network security
- b) importance of network security
- c) explain security techniques
- d) explain how to deal with security threats and other network vulnerabilities

CONTENT

21.3.1.9.T1 Network security

21.3.1.9.T2 Security techniques

- password
- encryption techniques
- authentication
- authorisation
- privileges

21.3.1.9.T3 Security threats and other network vulnerabilities

- firewall

PRACTICE

21.3.1.9.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- apply security techniques in a network

CONTENT

21.3.1.9.P1 Applying security techniques in a network

21.3.1.10T NETWORK DESIGN

THEORY

21.3.1.10.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- explain the meaning of network design
- describe the computer development life cycle
- explain hardware and software selection criteria

CONTENT

21.3.1.10.T1 Explain the meaning of network design

21.3.1.10.T2 Describing the computer development life cycle

21.3.1.10.T3 Explaining the hardware and software selection criteria

PRACTICE

21.3.1.10.P0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- setup and test connections

CONTENT

21.3.1.10.P1 Setting up and testing connections

21.3.1.11T TCP/IP PROTOCOLS

THEORY

21.3.1.11.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) meaning of TCP/IP concepts
- b) describe types of data flow

CONTENT

21.3.1.11.T1 Meaning of concepts

- TCP
- IP

21.3.1.11.T2 Describing types of data flow

- full duplex
- half duplex

PRACTICE

21.3.1.11.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) use internet protocol addresses
- b) test TCP/IP configuration

CONTENT

21.3.1.11.P1 Using of internet protocol addresses

21.3.1.11.P2 Testing TCP/IP configuration

21.3.1.12T COMMUNICATION SOFTWARE

THEORY

21.3.1.12.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) meaning of different types of communication software
- b) explain different types of communication software
- c) describe types of network software

CONTENT

21.3.1.12.T1 Meaning of terms

- computer software
- network software

21.3.1.12.T2 Explaining different types of communication software

21.3.1.12.T3 Describing types of network software

PRACTICE

21.3.1.12.P0 20.3.12P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) install communication software
- b) install different types of network software

CONTENT

21.3.1.12.P1 20.3.12P1 Installing communication software

- c) pine
- d) Eudora
- e) outlook express
- f) others

21.3.1.12.P2 20.3.12P2 Installing different types of network software

- Linux
- Unix
- Novel
- Windows NT
- others

21.3.1.13T INTERNET

THEORY

21.3.1.13.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of internet

CONTENT

21.3.1.13.T1 Explaining the meaning and importance of internet

PRACTICE

21.3.1.13.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) configure computer for internet use
- b) demonstrate file transfer network news and others
- c) demonstrate browse

CONTENT

- 21.3.1.13.T1 Configuring computer for internet use
- 21.3.1.13.T2 Demonstrating file transfer network
- 21.3.1.13.T3 browsing internet

21.3.1.14T EMERGING TRENDS

THEORY

21.3.1.14.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) identify emerging trends in networking
- b) discuss challenges of emerging trends
- c) discuss how to cope with emerging trends in networking

CONTENT

- 21.3.1.14.T1 Emerging trends in networking
- 21.3.1.14.T2 Challenges of emerging trends in networking
- 21.3.1.14.T3 Coping with challenges of emerging trends in networking

TEACHING/LEARNING RESOURCES

- A LAN setup (workstations and a server)
- Relevant network operating system
- Relevant network utilities (for testing connectivity)
- Whiteboard
- Relevant text books and free e-books
- Online content (www.howstuffworks.com, www.wikipedia.com...)
- Network Components
 - MAC
 - Network cables and other accessories
 - Switches
 - a router
 - A visit (where resources are not available)
- ISP services

ASSESSMENT MODE

- Written Tests
- Practical tests
- Projects

- Oral test

22.3.2. MANAGEMENT INFORMATION SYSTEMS (100 HOURS)

22.3.2.01: INTRODUCTION

This module unit is intended to equip the trainee with the necessary knowledge, skills and attitude that will enable him/her to manage information systems

22.3.2.02: GENERAL OBJECTIVES

By the end of this module unit, the trainee should be able to:

- a) understand the role of information systems in management
- b) appreciate the role of information in an organization
- c) understand the need for managing information system resources
- d) understand the uses of IS in organizations
- e) appreciate information systems ethics

22.3.2.03: SUMMARY AND TIME ALLOCATION (100 HOURS)

CODE	TOPIC	SUB-TOPIC	TIME (HOURS)
22.3.2.1	INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS	<ul style="list-style-type: none">• meaning of management information system• components of a management information system• role of information in an organization• system classification• qualities of good information system• social-technical view of information systems	14
22.3.2.2	USE OF INFORMATION SYSTEM IN MANAGEMENT	<ul style="list-style-type: none">• meaning and importance of management• use of IS in management• use of IS in management decision making• types of decisions• decision making cycle	12
22.3.2.3	MANAGEMENT OF INFORMATION SYSTEMS RESOURCES	<ul style="list-style-type: none">• information resource management concept• importance of managing information resources• information system resources• information society	8
22.3.2.4	INFORMATION SYSTEM PLANNING	<ul style="list-style-type: none">• meaning and importance of information systems planning• information systems planning process• reasons for aligning information systems plan to organisation plan	8

CODE	TOPIC	SUB-TOPIC	TIME (HOURS)
22.3.2.5	INFORMATION SYSTEM PROJECT MANAGEMENT	<ul style="list-style-type: none"> • meaning and importance of information system project management • information system project management techniques • sign of a failing information system project • causes for information system project failure • control measure and techniques of rescuing a failing information system project 	18
22.3.2.6	INFORMATION SYSTEMS ACQUISITION	<ul style="list-style-type: none"> • information systems acquisition process • factors that influence information system acquisition • factors that influence the choice of information system acquisition method • criteria for information system acquisition 	10
22.3.2.7	THE ROLE OF INFORMATION SYSTEM IN ORGANISATION	<ul style="list-style-type: none"> • the applications of IS in an organisation • application of IS for competitive advantages in an organisation 	4
22.3.2.8	INFORMATION SYSTEMS MAINTENANCE	<ul style="list-style-type: none"> • meaning and importance of information systems maintenance • techniques of maintaining an information system 	4
22.3.2.9	THE ROLE OF ICT IN AN ORGANIZATIONAL CHANGE	<ul style="list-style-type: none"> • meaning of organizational change • impact of IS as an agent of organizational change <ul style="list-style-type: none"> - automation - rationalization - business process - re-engineering • considerations for implementing a change programme in an organization 	10

CODE	TOPIC	SUB-TOPIC	TIME (HOURS)
22.3.2.10	INFORMATION SYSTEM ETHICS	<ul style="list-style-type: none"> • ethical issues in information systems • guidelines for responsible use of information systems • computer crime • control measures for computer crime 	10
22.3.2.11	EMERGING TRENDS IN MANAGEMENT INFORMATION SYSTEM	<ul style="list-style-type: none"> • emerging trends In MIS • challenges of emerging trends • cope with challenges in MIS 	2

22.3.2.1T INTRODUCTION TO MANAGEMENT INFORMATION SYSTEM (MIS)

THEORY

22.3.2.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of management information system
- b) describe the components of MIS
- c) explain the role of information in an organization
- d) describe the qualities of good information system
- e) describe the approaches to system classification
- f) describe the socio technical view of information systems

CONTENT

22.3.2.1.T1 Meaning of management information systems

22.3.2.1.T2 Components of management information systems

22.3.2.1.T3 Role of information in an organization

22.3.2.1.T4 Qualities of good information

22.3.2.1.T5 Approaches to system classification

- classification By organizational level supported
- classification By functional area supported
- classification By support provided
- classification By management activity supported

22.3.2.1.T6 Social-technical view of information systems

21.3.2T USE OF INFORMATION SYSTEM IN MANAGEMENT

THEORY

22.3.2.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance IS in management
- b) describe the use of IS in management decision making
- c) explain the types of decisions making
- d) describe the decision making cycles

CONTENT

22.3.2.1.T1 Meaning and importance of IS in management

- planning
- control

22.3.2.1.T2 Use of IS in management decision making

- DSS
- GDS
- EIS
- Others

22.3.2.1.T3 Describing types of decisions

- Structured
- Semi-structured
- Un-structured

22.3.2.1.T4 Decision making cycle

22.3.2.2T MANAGEMENT OF INFORMATION SYSTEM RESOURCES

THEORY

22.3.2.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- explain the meaning of information system concept
- explain the importance of managing information system resources
- describe information system resources
- describe information society

CONTENT

22.3.2.2.T1 Meaning and importance of information system resource concepts

22.3.2.2.T2 Importance of managing information system resources

22.3.2.2.T3 Describing Information system resources

22.3.2.2.T4 Describing Information society

- meaning
- characteristics
- challenges

22.3.2.3T INFORMATION SYSTEM PLANNING

THEORY

22.3.2.3.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- explain the meaning and importance of information system planning

- b) explain the steps involved in information system planning
- c) explain the reasons for aligning information system plan to the organisational plan

CONTENT

- 22.3.2.3.T1** Meaning and importance of information system planning
- 22.3.2.3.T2** Explaining the steps involved in information system planning
- 22.3.2.3.T3** Explaining the reasons for aligning information system plan to organisational plan

22.3.2.4T INFORMATION SYSTEM PROJECT MANAGEMENT

THEORY

22.3.2.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning and importance of information system project management
- b) describe information system project management techniques
- c) explain the signs of a failing information systems project
- d) explain the cause of information system project failure
- e) explain the control measures and techniques of a failing information system project

CONTENT

- 22.3.2.4.T1** Meaning and importance of information system
- 22.3.2.4.T2** Information system project management techniques
- 22.3.2.4.T3** Sign of a failing information system project
- 22.3.2.4.T4** Causes of information system project failure
- 22.3.2.4.T5** Explaining control measures and technique a failing information system project

22.3.2.5T INFORMATION SYSTEM ACQUISITION

THEORY

22.3.2.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe information system acquisition process
- b) explain factors that influence information systems acquisition
- c) describe the information system acquisition methods
- d) explain factors that influence the choice of information system acquisition

method

- e) explain the criteria for information system acquisition

CONTENT

- 22.3.2.5.T1** Describing information system acquisition process
- 22.3.2.5.T2** Explaining factors that influence information system acquisition
- 22.3.2.5.T3** Describing information system acquisition methods
- 22.3.2.5.T4** Factors that influence the choice of information system acquisition methods
- 22.3.2.5.T5** Criteria for information system acquisition

22.3.2.6T ROLE OF INFORMATION SYSTEM (IS) IN ORGANIZATION

THEORY

22.3.2.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the applications of IS in an organization
- b) explain the of IS and competitive advantages

CONTENT

- 22.3.2.6.T1** General applications of IS in an organization
- 22.3.2.6.T2** Application of IS and competitive advantage in an organisation

22.3.2.7T INFORMATION SYSTEMS MAINTENANCE

THEORY

22.3.2.7.T0 specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the importance information systems management
- b) explain the techniques of maintaining an information system

CONTENT

- 22.3.2.7.T1** Explaining the importance of IS
- 22.3.2.7.T2** Explaining the technique of maintaining

22.3.2.8T ROLE OF INFORMATION SYSTEM (IS) IN ORGANIZATION CHANGE

THEORY

22.3.2.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of organizational change
- b) describe the impact of IS as an agent of change in an organization
- c) explain key consideration for implementing a change programme in an organization

CONTENT

22.3.2.8.T1 Meaning of organizational change

22.3.2.8.T2 Impact of IS as an agent of change in an organization

22.3.2.8.T3 Considerations for implementing a change programme in an organization

22.3.2.9T INFORMATION SYSTEM ETHICS

THEORY

22.3.2.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain ethical issues in information systems
- b) describe the guidelines for responsible use of an information system
- c) describe computer crime
- d) explain control measures for computer crime

CONTENT

22.3.2.9.T1 Explaining ethical issues in information systems

22.3.2.9.T2 Describing gridlines for responsible use of information system

22.3.2.9.T3 Computer crime

22.3.2.9.T4 Control measures for computer crime

22.3.2.10T EMERGING TRENDS IN MANAGEMENT INFORMATION SYSTEM (MIS)

THEORY

22.3.2.10.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) identify emerging trends in MIS
- b) explain the challenges of emerging trends in MIS
- c) cope with the challenges of emerging trends in MIS

CONTENT

- 22.3.2.10.T1** Emerging trends in MIS
- 22.3.2.10.T2** Challenges of emerging trends in MIS
- 22.3.2.10.T3** Coping with the challenges of emerging trends in MIS

TEACHING/LEARNING RESOURCES

- Whiteboard
- Relevant text books and free e-books
- Content from www
- Resource person

ASSESSMENT MODE

- Written Tests
- Oral test

24.3.3. PRINCIPLES AND PRACTICE OF MANAGEMENT (144 HRS)

23.3.3.01: INTRODUCTION

This course unit is aimed at equipping the trainee with knowledge and skills that will enable him/her to perform management functions in an organisation.

23.3.3.02: GENERAL OBJECTIVES

By the end of this course unit, the trainee should be able to:

- a) explain and apply the management function in an organisation
- b) assist managers at various levels in an organisation
- c) appreciate the role played by management in development
- d) cultivate a sense of entrepreneurship
- e) appreciate the importance of purchasing and supplies management in information technology
- f) undertake marketing activities in Information Technology sector.

23.3.3.03: SUBJECT SUMMARY AND TIME ALLOCATION (154 HOURS)

CODE	TOPIC	SUB-TOPIC	HOURS
23.3.3.1	INTRODUCTION OF MANAGEMENT	<ul style="list-style-type: none">• definition of management• early contribution to management• the classical thought of management• the human relations school of thought• the modern thought to management• the environment thought of management• managerial functions as overview	14
23.3.3.2	PLANNING FUNCTION	<ul style="list-style-type: none">• nature and purpose of planning• types of plans• principles of planning• difficulties in planning	18
23.3.3.3	ORGANIZATION FUNCTION	<ul style="list-style-type: none">• structure and organisational design• departmentation• authority relationship• decentralisation of authority• decision making	18

CODE	TOPIC	SUB-TOPIC	HOURS
23.3.3.4	STAFFING FUNCTION	<ul style="list-style-type: none"> • definition of staffing • manpower planning • job design • job analysis • job evaluation • recruitment • selection • induction • retirement, redundancies and redeployment, training and retraining • personnel records, wages and redeployment, training and re-training • personnel records, wages and salaries industrial relations. 	18
23.3.3.5	DIRECTING/LEADING FUNCTION	<ul style="list-style-type: none"> • the human factors in directing/leading • motivation • nature of leading/directing • co-ordination 	16
23.3.3.6	CONTROLLING FUNCTION	<ul style="list-style-type: none"> • nature and characteristics of control • areas of control • non-bugetary controls • bugetary controls 	18
23.3.3.7	PERSONNEL MANAGEMENT	<ul style="list-style-type: none"> • the scope of personnel management • staffing • wages and salaries administration • employee development • industrial relations 	16
23.3.3.8	PURCHASING AND SUPPLIES MANAGEMENT	<ul style="list-style-type: none"> • overview of purchasing and supplies management • computer hard and software purchasing processes • ethical standards in purchasing computer hardware and software • negotiations and determination of terms of purchase • stock and inventory control information • technology industry 	18

CODE	TOPIC	SUB-TOPIC	HOURS
23.3.3.9	MARKETING MANAGEMENT	<ul style="list-style-type: none"> • overview of marketing and marketing management • marketing mix • marketing research • after sales service • consumer behaviour • marketing planning • marketing control 	18

23.3.3.1T INTRODUCTION TO MANAGEMENT

THEORY

23.3.3.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the meaning of management
- b) describe fully the evolution of management thought
- c) explain the role and contributions of the major players in the evolution for management thought; ROBERT OWEN, CHARLES BABBAGE, FREDRICK TAYLOR, HENRY FAYOL, LILIAN GILBREITH
- d) describe the impact of the external and internal environment on management
- e) explain the functions of modern management in an organization

CONTENT

23.3.3.1.T1 Definition of management

- what is management – AN ART or A SCIENCE?
- the theories of management
- who is a manager?

23.3.3.1.T2 The early contribution to management

- Roman Catholic Church
- Military organization
- Camera lists
- Robert Babbage etc

23.3.3.1.T3 The classical thought management

- Scientific Management
- Its characteristics and contributions to management thought and : Frederick Taylor and Frank and Lilian Gilbreith
- The behavioural science and human relations school of thought
- The characteristics and contributions of behavioural science management school of thought:

- Industrial Psychology, Sociological Approach,
- The Hawthorne Studies, Max Weber and Bureaucracy
- The characteristics of Human Relations School of Thought and its contributions to management thought – Henry Fayol
-
- The system approach to management thought
 - Its characteristics and contribution
 - Types of systems : Chester Bernard

23.3.3.1.T4 The modern school of management thought

- management science or mathematical approach management
- empirical or cox approach
- behavioural approach
- socio-technical systems approach
- contingency or situational approach
- operational or managerial roles approach
- combination of the above

23.3.3.1.T5 The Environment of Management

- overview
- external environment
- internal environment
- the impact of environment on management

23.3.3.1.T6 Managerial functions – an overview

- planning
- organising
- staffing
- leading/directing
- controlling

23.3.3.2T THE FUNCTION OF PLANNING

THEORY

23.3.3.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- explain the meaning of planning
- explain the reason for planning
- describe the steps in planning
- explain the types of plans
- explain the principles of planning
- describe the reasons for failure of plans and how they can be overcome

CONTENT

- 23.3.3.2.T1** Nature and Purpose of planning
- definition of planning
 - the need for planning
 - techniques used in planning
- 23.3.3.2.T2** Types of plans
- definition of a plan
 - purpose of mission
 - objectives
 - strategies
 - politics
 - rules and procedures
 - programming and scheduling
 - budgets
 - long term, medium term and short term plans
- 23.3.3.2.T3** Principles of planning
- flexibility
 - reality
 - commitment principles
 - persuasiveness
 - co-ordination
- 23.3.3.2.T4** Difficulties in planning
- reasons for plan failures
 - evaluation of plans
 - making effective plans
- 23.3.3.2.T5** Managerial Functions – An over view
- planning
 - organising
 - staffing
 - leading/directing
 - controlling

23.3.3.3T THE FUNCTION OF ORGANIZATION

THEORY

- 23.3.3.3.T0** Specific Objectives

By the end of this topic, the trainee should be able to:

- a) identify various organizational structures
- b) explain the need for departmentalisation in an organization
- c) identify the various basis of departmentalization
- d) distinguish between line and staff relationships in an organization
- e) identify the factors that determine the degree of delegation of authority
- f) relate the principles of organization to specific institutions
- g) identify the various ways of decision making in an organization e.g. and grow
- h) explain the circumstances committees, groups, etc would be used in decision making
- i) highlight the limitations of using each of the various methods of decision-making.

CONTENT

- 23.3.3.3.T1** Structure and organization design
- different types of organizations e.g. formal informal etc
- 23.3.3.3.T2** Departmentalization
- importance of departmentalization
 - basis of departmentalization e.g. time, product, function, customers etc
 - service departments
- 23.3.3.3.T3** Authority relationships
- authority and power
 - functional authority
 - line and staff relationship
 - limitations
- 23.3.3.3.T4** Decentralization of authority
- need for decentralization
 - the art of decentralization
 - delegation
 - factors determining degree of delegation
 - problems encountered in delegation
- 23.3.3.3.T5** Decision making
- the nature of decision-making
 - individual, committee and group decision-making
 - problems encountered in delegation

23.3.3.4T THE FUNCTION OF STAFFING

THEORY

23.3.3.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define staffing
- b) explain the manpower planning process
- c) explain the demand for and the supply of labour
- d) explain job analysis and job evaluation
- e) carry out job analysis and job evaluation
- f) explain recruitment and selection procedures
- g) identify various methods of induction training
- h) explain the concepts retirement, redundancies, employment, training and retraining
- i) explain the approaches to job design
- j) explain the uses of personnel records
- k) identify the various types of personnel

CONTENT

23.3.3.4.T1 Definition of staffing

23.3.3.4.T2 Manpower planning

- meaning
- the manpower planning process
- assessing the demand for and supply of labour

23.3.3.4.T3 Estimation manpower requirements

23.3.3.4.T4 Job analysis

- definition
- job description
- job specification
- benefits of job analysis

23.3.3.4.T5 Job Evaluation

- definition
- methods of job evaluation – analytical and non-analytical

23.3.3.4.T6 Recruitment

- definition
- recruitment policies and procedures
- sources of employee recruitment

- 23.3.3.4.T7** Selection
- definition
 - salient features of the selection process e.g. applications, short listing, interviewing, tests, referenced, decision
- 23.3.3.4.T8** Indication – orientation placement
- organisation manuals, organisation charts etc.
- 23.3.3.4.T9** Retirement redundancies re-deployment
- training
- 23.3.3.4.T10** Personnel records
- uses of personnel records
 - types of personnel records
 - computerised personnel records

23.3.3.5T THE FUNCTION OF DIRECTING/LEADERSHIP

THEORY

23.3.3.5.T1 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) highlight the necessary attributes of an effective leader
- b) explain the significance of the human factor in the process of directing
- c) explain various motivation theories
- d) evaluate the various leadership styles
- e) distinguish between leadership and managing

CONTENT

23.3.3.5.T2 The human factor in directing

- managing and the human factor
- models of people
- creativity and innovation in leadership

23.3.3.5.T3 Motivation

- meaning of motivation
- motivation factors
- theories of motivation
- the carrot and the stick
- hierarchy of needs
- expectancy etc

23.3.3.5.T4 Nature of directing/leadership

- leadership qualities
- leadership behaviour
- leadership styles
 - democratic
 - laissez – fair
 - benevolent
 - autocratic

23.3.3.5.T5 Co-ordination

- meaning and need for co-ordination
- styles of co-ordination

23.3.3.6T THE CONTROLLING FUNCTION

THEORY

23.3.3.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define the term control
- b) explain the role of the controlling process in an organisation
- c) explain the areas of control
- d) identify and evaluate the different types of control operations within and organization
- e) describe the control procedures used for human resources materials, finance and capital

CONTENT

23.3.3.6.T1 Nature and characteristics of control

- define control
- the role of control within an organization
- types of control
- open and closed loop systems
- principles of control

23.3.3.6.T2 Areas of control

- finance
- human resources
- materials and stock production
- capital

23.3.3.6.T3 Non-Budgetary controls

- personal observation-inspection
- reports

- audit programmes
- human resources accounting
- ratio analyze
- break-even analysis
- time event network analysis
- management by objectives (MBO)

23.3.3.7T PERSONNEL MANAGEMENT

THEORY

22.3.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- define personnel management
- explain the role and functions of a personnel department in an organization
- explain the duties and responsibilities of a personnel manger
- describe the various types of training and other staff development programmes
- identify areas that could stimulate conflict
- describe methods of reducing and resolving conflicts
- explain the term discipline and how disciplinary actions are carried out
- explain the relationship that exists between the trade unions, government and management

CONTENT

23.3.3.7.T1 The meaning and role of personnel management

- definition
- personnel management Vs general management
- personnel policies
- duties and responsibilities of a personnel manager

23.3.3.7.T2 Staffing

- manpower planning
- job analysis
- job evaluation
- recruitment
- selection
- placement
- job design
- retirement, redundancies and re-deployment
- personnel records

- 23.3.3.7.T3** Wages and salaries administration
- principles of wages and salary administration
 - wages and salary systems and employee benefits
 - job grading and salary scales
- 23.3.3.7.T4** Employee development
- the role of staff development
 - performance services appraisal
 - schemes of services
 - determination of training needs
 - types of training needs
 - training design
 - training evaluation
 - management development
- 23.3.3.7.T5** Industrial Relations
- definition
 - the background for industrial relations in Kenya
 - collective bargaining
 - disputes and strikes
 - discipline and disciplinary action
 - organizations involved in industrial relations

23.3.3.8T PURCHASING AND SUPPLIES MANAGEMENT

THEORY

23.3.3.8.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain the principles governing purchasing and supplies of computer
- b) outline the computer hard and software purchasing processes
- c) describe the ethical obligation of suppliers to I. T. equipment to the buyers
- d) uphold ethical standards in information technology
- e) describe the negotiations techniques
- f) explain the importance of stock control in information management

CONTENT

23.3.3.8.T1 Overview of purchasing and supplies management

- purchasing principles
- supply principles
- purchasing in a dynamic industry
- importance of purchasing activities to an industry

23.3.3.8.T2 Computer hardware and software purchasing processes e.g the purchase style

- ordering and clearing the order
- control of quantity and control
- receiving and inspection for quality
- terms and conditions of purchase
- order specification

23.3.3.8.T3 Ethical standards in purchasing computer hardware and software

- purchasing standards
- ethical obligations
- obligation of the company
- conflict of interest obligation to supplier
- combating unethical practices
- social responsibility

23.3.3.8.T4 Negotiations and determination of the terms of purchase

- the nature of negotiations
- techniques of negotiations
- stages of negotiations
- objectives and tactics of negotiations
- sourcing policy
- evaluation of suppliers
- managing contract of prize

23.3.3.8.T5 Stock and inventory control in Information Technology Industry

- stock and inventory control principles
- stock and inventory control techniques
- determination of stock levels
- stock taking techniques
- storage systems of Information Technology equipment

23.3.3.9T **MARKETING MANAGEMENT**

THEORY

23.3.3.9.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) highlight the principles governing marketing and marketing management
- b) describe the various elements of the marketing mix
- c) explain the reasons why organizations undertake marketing research

- d) outline the importance of after sale service to the information technology
- e) explain the reasons why a marketing manager needs to undertake consumer behaviours
- f) explain the concept of marketing planning
- g) discuss the need or marketing control in an organisation

CONTENT

- 23.3.3.9.T1** Overview of marketing and marketing principles
 - marketing principles
 - marketing concept
 - functions of a marketing manager
 - marketing management activities
- 23.3.3.9.T2** Marketing mix
 - product
 - price
 - promotion
 - distribution
- 23.3.3.9.T3** Marketing research
 - the nature and scope of marketing research
 - role of marketing research
 - procedure for conducting market research
 - market research design
- 23.3.3.9.T4** After sales services
 - need for after sales services in information technology industry
 - importance of after sales services in information technology equipment
- 23.3.3.9.T5** Marketing planning
 - nature of marketing planning
 - steps in marketing planning
 - developing marketing strategies
 - sales forecasting techniques
- 23.3.3.9.T6** Marketing control
 - scope of marketing control
 - marketing control cycles
 - development of standards of control
 - principles of effective marketing control
 - strategies in marketing control

TEACHING/LEARNING RESOURCES

- Whiteboard
- Relevant text books and free e-books
- Content from www
- Resource person

ASSESSMENT MODE

- Written Tests
- Oral test

24.3.4. QUANTITATIVE METHODS

24.3.4.01: INTRODUCTION

This course unit is intended to provide the trainee with the necessary computing skills to enable him/her to use numerical methods to quantify and process data.

24.3.4.02: GENERAL OBJECTIVES

By the end of this course unit, the trainee should be able to:

- a) use forecasting tools to analyse systems
- b) apply approximation methods in systems design
- c) appreciate financial, network planning and simulation techniques in systems design

24.3.4.03: SUBJECT SUMMARY AND TIME ALLOCATION

CODE	TOPIC	SUB-TOPIC	HOURS
24.3.4.1	DATA COLLECTION AND PRESENTATION	<ul style="list-style-type: none">• basic for data collection• data classification• data tabulation• diagrammatic and graphical presentation	10
24.3.4.2	MEASURES OF CENTRAL TENDENCY	<ul style="list-style-type: none">• definition of measures• properties• calculation and interpretation• data presentation	10
24.3.4.3	MEASURE OF DISPERSION	<ul style="list-style-type: none">• characteristics• relative and absolute measures• calculation of measures	12
24.3.4.4	CORRELATION AND REGRESSION	<ul style="list-style-type: none">• scatter diagram• correlation• correlation coefficient• coefficient of determination• linear regression models	14
24.3.4.5	TIME SERIES ANALYSIS	<ul style="list-style-type: none">• components of time series• time series models• measurement methods• application of time series	20
24.3.4.6	INDEX NUMBERS	<ul style="list-style-type: none">• definition of index numbers• types of construction problems• application of index numbers• limitations	12
24.3.4.7	PROBABILITY DISTRIBUTION	<ul style="list-style-type: none">• concepts of discrete and continuous variables• discrete distributions• continuous distribution	18
24.3.4.8	NETWORK PLANNING	<ul style="list-style-type: none">• introduction• network construction• critical construction• applications	18
24.3.4.9	LINEAR PROGRAMMING (LP)	<ul style="list-style-type: none">• models• types of models• LP models requirement• LP models• solutions methods	20

CODE	TOPIC	SUB-TOPIC	HOURS
24.3.4.10	ESTIMATION AND TEST OF HYPOTHESIS	<ul style="list-style-type: none"> • estimation • types of estimators • sampling distributions • confidence interval and interpretation • hypothesis • types of errors • test statistics and the test 	16
24.3.4.11	THEORY OF DECISION	<ul style="list-style-type: none"> • mathematical expectation • expectation and decision 	16
24.3.4.12	SIMULATION	<ul style="list-style-type: none"> • definition • techniques of simulation 	18
24.3.4.13	SAMPLING	<ul style="list-style-type: none"> • introduction • sampling and census • types of sampling and limitations 	16
24.3.4.14	FINANCIAL MATHEMATICS	<ul style="list-style-type: none"> • simple and compound interest • sinking fund • annuities and perpetuities • cash flow generation • mortgages • project appraisal methods • inventory control systems • economic order quantity models • safety stock and re-order level 	20

24.3.4.1T DATA COLLECTION AND PRESENTATION

THEORY

24.3.4.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) discuss the basic consideration for data collection
- b) classify collected data into various categories
- c) tabulate collected data
- d) diagrammatically and graphically present data

CONTENT

24.3.4.1.T1 Basis for data collection

- objective and scope
- statistical units
- data sources and types
- collection methods and their limitations

- 24.3.4.1.T2** Data classification
- classification functions
 - rule of classification
 - types of classification
- 24.3.4.1.T3** Data tabulation
- definitions and parts of table
 - types of tabulations
 - applications
- 24.3.4.1.T4** Diagrammatic and graphic presentation
- types of construction diagrams
 - types of construction graphs
 - interpretation of diagrams and graphs

24.3.4.2T MEASURES OF CENTRAL TENDENCY

THEORY

24.3.4.2.T0 23.3.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define measures of central tendency
- b) state the properties of the measures of central tendency
- c) determine the measures of central tendency

CONTENT

- 24.3.4.2.T1** Definition of measures of central tendency
- 24.3.4.2.T2** Properties of the measures of the central tendency
- 24.3.4.2.T3** Calculation and interpretation
- mean
 - mode
 - medium

24.3.4.3T MEASURES OF DISPERSION

THEORY

24.3.4.3.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) state the characteristics of a good measure of dispersion
- b) differentiate between the absolute and relative measures

- c) calculate and interpret the measures of dispersion

CONTENT

- 24.3.4.3.T1** Characteristic
- 24.3.4.3.T2** Relative and absolute measures
- definition
 - merits and demerits
- 24.3.4.3.T3** Calculation of measures of dispersion
- range
 - mean deviation
 - quartile, decile, percentiles, etc
 - standard deviation
 - skewness and curtosis

24.3.4.4T CORRELATION AND REGRESSION

THEORY

24.3.4.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define terms related to correlation
- b) compute parameters related to correlation
- c) compute coefficient to determinants
- d) explain independent and dependent variables
- e) draw scatter diagrams
- f) draw the line of best fit by free hand method
- g) explain the term regression line
- h) differentiate between mathematical model and regression model

CONTENT

- 24.3.4.4.T1** Computation of parameters related to correlation
- product moment
 - rank correlation
 - coefficient of determination
- 24.3.4.4.T2** Interpretation of values of correlation coefficient
- 24.3.4.4.T3** Explanation of terms
- independent variables
 - dependent variables

- 24.3.4.4.T4 Drawing scatter diagrams
- 24.3.4.4.T5 Drawing line of best fit
- 24.3.4.4.T6 Explanation of regression line
- 24.3.4.4.T7 Distinction between mathematical model and regression model
- 24.3.4.4.T8 Principles of least square method
- 24.3.4.4.T9 Determining normal equations
- 24.3.4.4.T10 Solving normal equations to obtain the regression equation
- 24.3.4.4.T11 Using regression equation of forest
- 24.3.4.4.T12 Assumptions made in linear regression
 - linearity between x and y
 - standard deviation of error term is constant and same for all values of x
 - distribution of error is normal

24.3.4.5T TIME SERIES

THEORY

24.3.4.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe the characteristic of time series
- b) describe the components of a time series
- c) distinguish between the two different models
- d) decompose the time series into its components
- e) extrapolate past the future values using the trend
- f) interpolate values using trend

CONTENT

- 24.3.4.5.T1 Description of time series
 - definition
 - characteristics
 - time period
- 24.3.4.5.T2 Description of components
 - trend
 - cyclic variations
 - seasonal variations
 - random variations
- 24.3.4.5.T3 Models
 - trends

- semi average
- centered moving average
- mathematical model (least squares method)
- free hand fitting
- Seasonal – moving averages
- $(R-Y) = -(T+C+S)$

24.3.4.5.T4 Extrapolation of past and future values

24.3.4.5.T5 Interpolation of values

24.3.4.6T INDEX NUMBERS

THEORY

24.3.4.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) define index numbers
- b) explain advantages and disadvantages of different types of index numbers
- c) state the uses of index numbers
- d) choose a representative base period
- e) explain how weighting are calculated
- f) construct index numbers

CONTENT

24.3.4.6.T1 Definition of index numbers

24.3.4.6.T2 Definition of basic terms

- price index
- quantity index
- paasche index number
- laspayres index numbers
- weighted index numbers
- base period
- current period
- weights
- time reversal and chaining

24.3.4.6.T3 Advantages and disadvantages of different types of index numbers

- paasche
- laspayres
- weighted index numbers

- 24.3.4.6.T4 Uses of index numbers
- 24.3.4.6.T5 Choice of base period
- 24.3.4.6.T6 Calculation of weightings
 - weightings of price
 - weightings for individual commodities
 - weightings for quantities
- 24.3.4.6.T7 Construction of indices

24.3.4.7T **PROBABILITY DISTRIBUTIONS**

THEORY

24.3.4.7.T0 **Specific Objectives**

By the end of the topic, the trainee should be able to

- a) differentiate between discrete and continuous variables
- b) explain discrete probability distributions
- c) apply discrete probability distributions to problems
- d) explain continuous variables
- e) apply continuous probability distributions to problems

CONTENT

- 24.3.4.7.T1 Discrete and continuous variables
- 24.3.4.7.T2 Discrete probability distributions
- 24.3.4.7.T3 Application of discrete probability distribution to solve problems
 - binomial
 - poisson
- 24.3.4.7.T4 Continuous probability distribution to solve problems
 - normal probability
 - analysing measurements that follow natural laws
 - binomial probability approximation
 - problems involving confidence level and interval

24.3.4.8T **NETWORK PLANNING**

THEORY

24.3.4.8.T0 **Specific Objectives**

By the end of this topic, the trainee should be able to:

- a) explain network planning
- b) explain importance of network planning
- c) explain the uses of network planning
- d) explain terms associated with network planning
- e) state the rules of drawing network
- f) draw a network
- g) identify critical path]
- h) find the minimum time required to complete project.

CONTENT

- 24.3.4.8.T1** Network planning
- 24.3.4.8.T2** Importance of network planning
- 24.3.4.8.T3** Uses of network planning
- 24.3.4.8.T4** Terms associated with network planning
- node
 - activity
 - preceding time
 - succeeding time
 - PERT
 - most likely time
 - optimistic time
 - pessimistic time
- 24.3.4.8.T5** Rules of drawing a network
- dangling
 - looping
 - dummy variables
- 24.3.4.8.T6** Drawing a network
- node
 - activity
 - starting point
 - ending point
- 24.3.4.8.T7** Critical path
- forward pass
 - backward pass
 - optimistic time
 - pessimistic time
 - most likely time

- 24.3.4.8.T8** Minimum time required to complete a project
- mean time required to complete a project
 - standard deviation of the time required to complete the project

24.3.4.9T LINEAR PROGRAMMING

THEORY

24.3.4.9.T0 23.3.9.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain linear programming
- b) explain the constraints in linear programming
- c) state linear programming assumption
- d) explain limitations of linear programming
- e) outline the objectives of linear programming
- f) use simplex method to solve linear programming problems
- g) state when to use graphical methods
- h) apply graphical methods to solve problems

CONTENT

24.3.4.9.T1 Constraints which limit the achievement of objectives

- policy
- finance
- market
- availability of resources

24.3.4.9.T2 Statement of linear programming assumptions

- linearity
- divisibility
- additivity
- single objectives
- simple cost function
- external cost function
- certainty

24.3.4.9.T3 Limitations of linear programming

24.3.4.9.T4 Objectives of linear programming

- maximization of profit
- minimization of costs

- make optimal use of resources

24.3.4.9.T5 Using simplex method to solve linear programming problems

24.3.4.9.T6 When to use graphical method

- only w variables are involved
- 2 or more constraints operating

24.3.4.9.T7 Use graphical method to solve problems

24.3.4.10T ESTIMATION AND TEST OF HYPOTHESIS

THEORY

24.3.4.10.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- define estimation
- differentiate between the two types of estimation
- determine the sampling distribution of a statistic
- determine the confidence interval for a parameter
- design a simple hypothesis testing
- define errors in hypothesis testing
- test various hypothesis

CONTENT

24.3.4.10.T1 Estimation

- definition
- need for estimation

24.3.4.10.T2 Types of estimators

- point estimators
- interval estimators

24.3.4.10.T3 Sampling distribution

- central limit problems
- \bar{x} and s^2 distribution
- distribution of difference between means (\bar{x}) and between proportions (A/P)

24.3.4.10.T4 Confidence interval and interpretations

24.3.4.10.T5 Hypothesis

- definitions
- design and rules

- types

24.3.4.10.T6 Types of errors

- type I errors
- type II errors

24.3.4.10.T7 Test statistics and the test

24.3.4.11T DECISION

THEORY

24.3.4.11.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- define mathematical expectation
- calculate mathematical expectation
- state bayer's rule
- construct pay-off table
- state maxima rule
- solve decision-tree problems

CONTENT

24.3.4.11.T1 Definition of mathematical expectation

24.3.4.11.T2 Calculation of mathematical expectation

24.3.4.11.T3 Statement of Bayer's rule

24.3.4.11.T4 Construction of pay-off table

24.3.4.11.T5 Statement of maxima rule

24.3.4.11.T6 Solution of decision tree problem

24.3.4.12T SIMULATION

THEORY

24.3.4.12.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- explain simulation
- explain types of simulation
- solve problems using simulation techniques

CONTENT

24.3.4.12.T1 Meaning of simulation

24.3.4.12.T2 Types of simulation

- physical
- mathematical
- deterministic
- probabilistic
- Monte Carlo

24.3.4.12.T3 Problems solving using simulation

- random numbers
- generation of random numbers
- Monte-Carlo simulation technique

24.3.4.13T SAMPLING

THEORY

24.3.4.13.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- define the terms used in sampling
- explain the concept of sampling distribution
- calculate standard error
- relate the mean and SD of sampling distribution of mean to mean and SD of the parent distribution
- determine the unbiased estimate of the population mean and variance from the sample data

CONTENT

24.3.4.13.T1 Definition of terms

- random sampling
- sampling with replacement
- population
- samples
- sampling distributions

24.3.4.13.T2 Explanation of the concepts of sampling distribution

24.3.4.13.T3 Calculation of standard errors

24.3.4.13.T4 Relationship between mean and SD of the sampling distribution of the mean and the SD of the parent distribution.

24.3.4.13.T5 Recognition that the distributions of the sample mean of normal distribution is normal distribution.

24.3.4.13.T6 Determination of population mean and SD from sample data

- when sample size is large
- when sample size is small

24.3.4.14T FINANCIAL MATHEMATICS

THEORY

24.3.4.14.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) Explain simple and compound interest
- b) explain the concepts of sinking fund
- c) calculate the value of annuity
- d) use annuity table
- e) define terms used in relation with present values
- f) use discount factor table
- g) calculate present value
- h) explain terms used in relation with annuities
- i) calculate present value of annuity
- j) use present value of annuity table for calculation
- k) define inventory
- l) describe the control system
- m) calculate economic order quantity (EOQ)
- n) determine safety stock (SS) and re-order level

CONTENT

24.3.4.14.T1 Simple and compound interest

24.3.4.14.T2 Concepts of sinking fund

24.3.4.14.T3 Future value of annuity

24.3.4.14.T4 Use of annuity table

24.3.4.14.T5 Terms used in relation with present value

- Present value
- discounting
- discount tree
- discount rate
- discounting factor

24.3.4.14.T6 Cash flow generation using discounting factor table

24.3.4.14.T7 Calculation of present value

24.3.4.14.T8 Inventory and control systems

- re-order control systems
- periodic systems
- ABC systems

- MRP

24.3.4.14.T9 Economic order quantity (E)Q) model

- without discount
- with discount
- limitations

24.3.4.14.T10 Safety stock and re-order level

TEACHING/LEARNING RESOURCES

- Whiteboard
- Relevant text books and free e-books
- Content from www
- Resource person
- charts

ASSESSMENT MODE

- Written Tests
- Oral test

25.3.5. INTERNET BASED PROGRAMMING-(110 HOURS)

25.3.5.01: INTRODUCTION

This module unit is intended to provide the trainee with knowledge and skills to develop internet based programs

25.3.5.02: GENERAL OBJECTIVES

By the end of this module unit the trainee should be able to:-

- a) appreciate the use various web development languages
- b) acquire development skills in internet based programs
- c) use the various web authoring tools
- d) develop a web site

25.3.5.03: COURSE SUMMARY AND TIME ALLOCATION (110 HOURS)

CODE	TOPIC	SUB TOPIC	HOURS		TOTAL
			T	P	
25.3.5.1	INTRODUCTION TO INTERNET-BASED PROGRAMMING	<ul style="list-style-type: none">• internet-based programming• world wide web• role of web site in organizations	2		2
25.3.5.2	WEB PROGRAMMING	<ul style="list-style-type: none">• web programming• approaches to web programming• web programming languages• web programming interfaces• criteria for choosing a web programming language	8	2	10
25.3.5.3	HTML CODING	<ul style="list-style-type: none">• HTML• HTML structure• HTML Tags• Insert objects in HTML document• HTML Hyperlinks• tables• frames• forms	8	30	38
25.3.5.4	WEB AUTHORIZING AND DESIGN TOOLS	<ul style="list-style-type: none">• web design tool• features of web design tools• web authoring, design formats and protocols• characteristics of a good design• design a web site	10	26	36
25.3.5.5	JAVA SCRIPT AND ACTIVE SERVER PAGES	<ul style="list-style-type: none">• describe Java Script and ASP• data input procedures• data output procedures	4	14	18

CODE	TOPIC	SUB TOPIC	HOURS		TOTAL
			T	P	
25.3.5.6	WEB SECURITY	<ul style="list-style-type: none"> • web security • web security issues • challenges of web security • control measures 	4		4
25.3.5.7	EMERGING TRENDS IN INTERNET BASED PROGRAMMING	<ul style="list-style-type: none"> • emerging trends in internet-based programming • challenges of emerging trends in internet-based programming • cope with the challenges of emerging trends in internet-based programming 	2		2

25.3.5.1T INTRODUCTION TO INTERNET BASED PROGRAMMING

25.3.5.1.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- explain internet-based programming
- describe world wide web
- explain the role of web sites in today's organizations

CONTENT

25.3.5.1.T1 Internet-based programming

25.3.5.1.T2 World Wide Web

25.3.5.1.T3 Role of web sites in organizations

25.3.5.2T WEB PROGRAMMING

THEORY

25.3.5.2.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain web programming
- b) describe the approaches to web programming
- c) identify web programming languages
- d) explain the criteria for choosing a web programming language
- e) describe web programming interfaces

CONTENT

- 25.3.5.2.T1** Explanation of Web programming
- 25.3.5.2.T2** Approaches to web programming
- Server-side programming
 - Client-side programming
- 25.3.5.2.T3** Web programming languages
- HTML
 - Perl
 - PHP
 - Python
 - Java script
 - Others
- 25.3.5.2.T4** Criteria for choosing a web programming language
- 25.3.5.2.T5** Common web programming interfaces
- Common Client Interface (CCI)
 - Common Gateway Interface (CGI)

PRACTICE

- 25.3.5.2.P0** **Specific Objectives**
- By the end of this topic, the trainee should be able to:
- a) install web program requirements

CONTENT

- 25.3.5.2.P1** Installing web programming requirement

25.3.5.3T HTML CODING

THEORY

- 25.3.5.3.T0** **Specific Objectives**
- By the end of this topic, the trainee should be able to:
- a) HTML
 - b) describe the features of HTML

- c) describe HTML structure

25.3.5.3.T1 HTML

25.3.5.3.T2 HTML structure

25.3.5.3.T3 HTML Tags

PRACTICE

25.3.5.3.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) insert objects in a HTML document
- b) create hyperlinks
- c) design a web page with tables
- d) design a web page with frames
- e) design a web page with forms

CONTENT

25.3.5.3.P1 Inserting objects in HTML document

- images
- video clip
- background music

25.3.5.3.P2 Creating HTML Hyperlinks

- links to images
- links to web pages
- links to E-mails
- links to Uniform Resources Locator (URL)

25.3.5.3.P3 Designing a webpage with tables

- rows
- columns
- table width and height

25.3.5.3.P4 Designing a webpage with frames

- frame set
- frame column
- frame rows

25.3.5.3.P5 Designing a webpage with forms

- form input commands

- text and numeric input commands
- button commands
- submit and reset commands

25.3.5.4T WEB AUTHORIZING AND DESIGN TOOLS

THEORY

25.3.5.4.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- describe web design tool
- describe the features of different web design tools
- describe web authoring protocols
- describe the characteristics of a good web design
- describe web authoring tools
- develop a web site

CONTENT

- 25.3.5.4.T1** Description of web design tool
- 25.3.5.4.T2** Features of web design tools
- 25.3.5.4.T3** Web authoring protocols
- 25.3.5.4.T4** Characteristics of a good web design
- 25.3.5.4.T5** Description of authoring tools

PRACTICE

25.3.5.4.P0 Specific Objectives

By the end of this topic, the trainee should be able to:

- describe website/webpage

CONTENT

- 25.3.5.4.P1** Design a website/webpage
 - introduction
 - adding contents in a site
 - formatting
 - working with graphics and sounds
 - designing page layout
 - using libraries and templates
 - creating forms
 - navigating the site
 - linking to databases

- testing

25.3.5.5T JAVA SCRIPT AND ACTIVE SERVER PAGES

THEORY

25.3.5.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) describe java script and ASP
- b) explain the data input procedures
- c) explain the data output procedures

CONTENT

25.3.5.5.T1 Describing to Java Script and ASP

25.3.5.5.T2 Data input procedures

25.3.5.5.T3 Data output procedures

25.3.5.5.T4 Implement Java Script and ASP

PRACTICE

25.3.5.5.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) design web using a java script and ASP

CONTENT

25.3.5.5.T1 Designing web using a java script and ASP

25.3.5.6T WEB SECURITY

THEORY

25.3.5.6.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) explain web security
- b) identify web security issues
- c) explain the challenges of web security
- d) explain web security control measures

CONTENT

25.3.5.6.T1 Explaining web security

25.3.5.6.T2 Identifying web security issues

25.3.5.6.T3 Challenges of web security

25.3.5.6.T4 Explaining web security measures

25.3.5.7T EMERGING TRENDS IN INTERNET BASED PROGRAMMING

THEORY

25.3.5.7.T0 Specific Objectives

By the end of this topic, the trainee should be able to:

- a) identify emerging trends in internet-based programming
- b) explain the challenges of emerging trends in internet-based programming
- c) cope with the challenges of emerging trends in internet-based programming

CONTENT

25.3.5.7.T1 Emerging trends in internet-based programming

25.3.5.7.T2 Challenges of emerging trends in internet-based programming

25.3.5.7.T3 Coping with the challenges of emerging trends in internet-based programming

TEACHING/LEARNING RESOURCES

- Whiteboard
- Relevant text books and free e-books
- Sample web pages downloaded from www
- Appropriate web design software
 - Microsoft FrontPage
 - Adobe Dream weaver CS3
 - Dotnet frame work
 - Java
 - Others

ASSESSMENT MODE

- Written Tests
- Oral test
- Practical tests
- projects

25.3.6. BUSINESS PLAN

25.3.6.01: INTRODUCTION

This module unit is designed to equip the trainee with knowledge, skills and attitudes to enable him/her prepare a business plan.

25.3.6.02: GENERAL OBJECTIVES

At the end of this module unit the trainee should be able to:

- a) understand the background of intended business
- b) understand the market environment of the business
- c) understand organization and management plan
- d) appreciate operational plan
- e) prepare financial projections
- f) prepare a business plan

25.3.6.03: BUSINESS PLAN

CODE	TOPIC	SUB-TOPIC	T	P	TOTAL HOURS
25.3.6.1	INTRODUCTION TO BUSINESS PLANNING	<ul style="list-style-type: none">• Meaning of business plan• Purpose of a business plan• Features of a business plan• Guidelines for developing an effective business plan	2	2	4
25.3.6.2	BUSINESS DESCRIPTION	<ul style="list-style-type: none">• Business name• Business location and address• Form of ownership• Type of business• Products/ services• Justification of the opportunity• The industry• Business goals and objectives• Entry and growth strategy• SWOT analysis	2	4	6
25.3.6.3	MARKETING PLAN	<ul style="list-style-type: none">• Customer identification• Competitor analysis• Market share• Promotion and advertising• Pricing strategy• Sales tactics• Sales target• Distribution strategy• Customer service	2	6	8

CODE	TOPIC	SUB-TOPIC	T	P	TOTAL HOURS
25.3.6.4	ORGANISATION AND MANAGEMENT PLAN	<ul style="list-style-type: none"> • Oganisation structure • Management team • Recruitment, training and promotion • Remuneration and incentives • Licenses, permits and other requirements • Supporting services 	2	6	8
25.3.6.5	OPERATIONAL/ PRODUCTION PLAN	<ul style="list-style-type: none"> • Production facilities and capacity utilization • Production and operation strategy • Production process • Regulations affecting operations • Operational time table/production schedule 	2	6	8
25.3.6.6	FINANCIAL PLAN	<ul style="list-style-type: none"> • Pre-operations cost • Working capital • Cash flow projections • Pro-forma income statements • Pro-forma balance sheets • Break even analysis • Profitability ratios • Desired financing • Proposed capitalization • Potential risks 	4	6	10
25.3.6.7	PRESENTATION	<ul style="list-style-type: none"> • Business plan writing • Presentation of the business plan 	2	2	4

CODE	TOPIC	SUB-TOPIC	T	P	TOTAL HOURS
25.3.6.8	EMERGING TRENDS AND ISSUES	<ul style="list-style-type: none"> • Emerging issues in business planning • Strategies in dealing with emerging issues 	1	1	2
TOTAL					50

25.3.6.1T INTRODUCTION TO BUSINESS PLAN

THEORY

25.3.6.1.T0 Specific Objectives

At the end of this topic the trainee should be able to:

- a) Explain the meaning of a business plan
- b) Explain the purposes of a business plan
- c) Identify the features of a business plan
- d) Describe guidelines for developing an effective business plan

25.3.6.1.T1 Meaning of a business plan

25.3.6.1.T2 Purposes of a business plan

25.3.6.1.T3 Features of a business plan

25.3.6.1.T4 Guidelines for developing an effective business plan

25.3.6.2T BUSINESS DESCRIPTION

THEORY

25.3.6.2.T0 Specific Objectives

At the end of this topic the trainees should be able to:

- a) Provide the business name
- b) Describe business location and address
- c) Discuss form of ownership
- d) Explain the type of business
- e) Describe the products offered
- f) Discuss the the justification of opportunity
- g) Describe the industry

- h) Explain the goals of business
- i) Explain the entry and growth strategy
- j) Discuss SWOT analysis

- 25.3.6.2.T1** Provide the business name
- 25.3.6.2.T2** Business location and address
- 25.3.6.2.T3** Form of ownership
- 25.3.6.2.T4** Type of business
- 25.3.6.2.T5** Products offered
- 25.3.6.2.T6** Justification of opportunity
- 25.3.6.2.T7** The industry
- 25.3.6.2.T8** The goals of business
- 25.3.6.2.T9** Entry and growth strategy
- 25.3.6.2.T10** SWOT analysis

25.3.6.3T MARKETING PLAN

THEORY

- 25.3.6.3.T0** **Specific Objectives**
At the end of this topic the trainees should be able to:
 - a) Identify customers
 - b) Describe the competitors
 - c) Determine the market share
 - d) Explain the methods of promotion and advertising
 - e) Explain the pricing strategy
 - f) Set sales target
 - g) Describe the sales tactics
 - h) Describe the distribution strategy
 - i) Describe the customer service strategy
- 25.3.6.3.T1** Identification of customers
- 25.3.6.3.T2** Competitors analysis
- 25.3.6.3.T3** Determination the market share
- 25.3.6.3.T4** Methods of promotion and advertising

- 25.3.6.3.T5 Pricing strategy
- 25.3.6.3.T6 Set sales target
- 25.3.6.3.T7 Sales tactics
- 25.3.6.3.T8 Distribution strategy
- 25.3.6.3.T9 Customer service strategy

25.3.6.4T ORGANISATION AND MANAGEMENT PLAN

THEORY

25.3.6.4.T0 Specific Objectives

At the end of this topic the trainees should be able to:

- a) Describe the organization structure
- b) Describe the management team
- c) Identify other business personnel
- d) Explain recruitment, training and promotion of personnel
- e) Discuss remuneration and incentives for personnel
- f) Identify licenses persist and legal requirements
- g) Identify support services

- 25.3.6.4.T1 Organization structure
- 25.3.6.4.T2 Management team
- 25.3.6.4.T3 Other business personnel
- 25.3.6.4.T4 Recruitment, training and promotion of personnel
- 25.3.6.4.T5 Remuneration and incentives for personnel
- 25.3.6.4.T6 Licenses persist and legal requirements
- 25.3.6.4.T7 Support services

25.3.6.5T OPERATIONAL AND PRODUCTION PLAN

THEORY

25.3.6.5.T0 Specific Objectives

At the end of this topic the trainees should be able to:

- a) Identify production facilities and capacity
- b) Develop a production and operation strategy
- c) Describe the production process of the products
- d) Discuss the regulations affecting operations

e) Prepare operation time table/production schedule

- 25.3.6.5.T1** Production facilities and capacity
- 25.3.6.5.T2** Develop a production and operation strategy
- 25.3.6.5.T3** Production process of the products
- 25.3.6.5.T4** Production process of the products
- 25.3.6.5.T5** Regulations affecting operations
- 25.3.6.5.T6** Prepare operation time table/production schedule

25.3.6.6T FINANCIAL PLAN

THEORY

25.3.6.6.T0 Specific Objectives

At the end of this topic the trainees should be able to:

- a) Determine pre-operational costs
- b) Estimate working capital
- c) Estimate cash-flow projections
- d) Prepare pro-forma income statements
- e) Prepare pro-forma balance sheets
- f) Calculate break-even point
- g) Calculate profitability ratios
- h) Calculate desired financing
- i) Calculate proposed capitalization
- j) Identify potential

- 25.3.6.6.T1** Determination pre-operational costs
- 25.3.6.6.T2** Estimating working capital
- 25.3.6.6.T3** Estimating cash-flow projections
- 25.3.6.6.T4** Preparation pro-forma income statements
- 25.3.6.6.T5** Preparation pro-forma balance sheets
- 25.3.6.6.T6** Calculation break-even point
- 25.3.6.6.T7** Calculation profitability ratios

25.3.6.7T PRESENTATION

THEORY

25.3.6.7.T0 Specific Objectives

At the end of this topic the trainees should be able to:

- a) write the final business plan
- b) make a presentation of the business plan

25.3.6.7.T1 Writing the final business plan

- format
- elements

25.3.6.7.T2 Presentation of the business plan

- order of presentation
- flow of ideas/content
- communication style
- appropriate display methods for final document

25.3.6.8T EMERGING TRENDS AND ISSUES

THEORY

25.3.6.8.T0 Specific Objectives

At the end of this topic the trainees should be able to:

- a) identify the emerging trends in business plan
- b) identify the challenges posed by the emerging trends and issues
- c) explain various ways of coping with challenges

25.3.6.8.T1 Emerging trends in business plan

25.3.6.8.T2 Challenges posed by the emerging trends and issues

25.3.6.8.T3 Ways of coping with challenges

SUGGESTED LEARNING ACTIVITIES

- Discussions
- Field study
- Demonstration
- Practical exercise
- Presentation
- Use of samples

SUGGESTED LEARNING RESOURCES

- Manuals
- Samples
- Relevant text books
- News papers and magazines
- Media
- Internet

SUGGESTED EVALUATION METHODS

- Questions and answers
- Continuous assessment
- Presentations
- Written business