

**List of the Members who attended the meeting of Trade Committee for
DPCS held on 29/4/97 at S.S.Bhavan, New Delhi,
under the Chairmanship of Director of Trg., DGE & T**

1. Shri D.S.Dagaur
Director of Training,
DGE&T
Chairman
2. Prof. J.P.Gupta
AICTE, N.Delhi.
3. Shri O.P.Goyal
Technical Director
N.I.C., N.Delhi.
4. Shri Rajiv Mathur
Regional Manager,
NIIT, N.Delhi.
5. Shri V.S.P.Srivastava
Joint Director, Computer Div.
School of Computer and Information
Sciences, IGNOU, New Delhi.
6. Shri R.Sethi
Senior System Analyst
National Informatics Centre
7. Shri Anurag Gupta,
Senior Consultant,
NIIT, New Delhi.
8. FR. K.C.John
Administrator
Don Bosco School
New Delhi.
9. Shri Ashok Kumar
JDT, DGE & T
10. Shri Y.P.Sharma
JDT, DGE & T
11. Shri R.Bhatnagar,
Senior Programmer
DGE & T
12. Mrs.Anita Srivastava
ADT, DGE & T
13. Shri Y.K.Bangia
Dy.Director of Training, DGE & T.
Member Secretary

**Computer Operator & Programming Assistant
Under
Craftsmen Training Scheme**

Syllabus for the trade of "Computer operator & Programming Assistant" at Craftsmen level under the aegis of NCVT.

ELIGIBILITY :

Qualification : 12th class pass under 10 + 2 system or duly recognised Diploma in engineering from any polytechnic of 3 years duration after class 10th.

Duration of Training : 52 weeks (one year)

42 hours per week

- 1 hour/week Social Studies

- 4 hours/week Extra-Curricular

42 - 5 = 37 hours/week Computer Course

27 hours/week = Practical

10 hours/week = Theory

Total no. of hours for Computer Courses : $52 \times 37 = 1924$

Total no. of Lab (Practical) Hours : $52 \times 27 = 1404$

Total no. of Theory Hours : $52 \times 10 = 520$

OBJECTIVE OF THE COURSE :

1. Learning fundamentals of computers.
2. Identify, analyse and check validity of data.
3. To attain the data entry speed.
4. Provide hands-on-experience on PC/Micro Computer.
5. Learning computer languages like COBOL, C++.
6. Learning various packages supported by PC such as Xbase, Spread sheet (LOTUS 1-2-3), World Processor (Wordstar, word perfect) office automation manager packages (lotus smart suite, MS-Office, etc)
7. Develop programmes from planning and flow charting to coding and debugging.
8. Stressing on business data processing and office automation.

MODULE-I
Fundamentals of Computers (Hrs. Time : 160, P : 180)

- Unit-I** History of Computer & Fundamentals (T-40)
- Introduction
- Definition
- type and classification
- Computer characteristics
- functions
- Unit-II** Computer Hardware and Software concepts (T-80)
- Input devices.
- Output devices.
- CPU, Memory, Secondary memory.
- Unit-III** Introduction to Personal Computer/Microcomputer and operating system (UNIX, WINDOWS, MSDOS, NETWARE) (T-20, P-180)
- Unit-IV** Concept of information & dat. processing (T-20)

MODULE II (T : 210, P : 800)

- Unit-I** : Programming Practice and Techniques. (T-25)
- Unit-II** : Program design & logic (T-25)
- Unit-III** : LANGUAGE-COBOL PC Software (T-40, P-250)
- Unit-IV** : Programming and problem solving through "C" (T-80, P-280)
- Unit-V** : Introduction to business Organisation (T-40, P-250)

MODULE-III (T : 150, P : 424)

- Unit-I** : Office Automation Package (T-40, P-80)
- Unit-II** : Spread Sheet Package (T-35, P-100)
- Unit-III** : Xbase package (T-30, P-110)
- Unit-IV** : An Overview of selected packages, (T-30, P-110)
- Unit-V** : Computer & Communication, Internet, E-Mail (T-15, P-24)

MODULE-I (Hrs. T : 160, P : 180)

Unit-I : Fundamentals of Computers (Hrs. T : 40)

History of Computer

- Abacus of ENIAC, Computer Generations, Languages, Software and application, Computer in India.

Computers - An Introduction

- Functions of computer : input, processing, output, Functions of ALU, control, storage, input and output devices.

Types/Classification

- Classification of Computer : Home, Micro, Mini, Mainframe, Super Computers.
- Centralised decentralised systems.
- Networks of Computers-Homogenous, Heterogenous

Characteristics

- Clock Speed
- Accuracy

Functions

- Bits, bytes, characters, field, record, file.
Representation of Data : Binary, binary addition and subtraction, octal, hexadecimal, ASCII, EBCDIC, Positive versus negative integers, floating point numbers.
- Higher level and lower level Languages.

UNIT-II : HARDWARE AND SOFTWARE CONCEPTS (T:80)

- Computer Hardware : Electronic Digital Computers
- Input devices : On line data input devices & their importance :
Dumb terminals, intelligent terminals, Voice recognition devices touch tone terminals, mouse, digitizers, MICR, OCR, OMR, Joy Stick , Light Pen.
- Offline data input :
Key to disk system, key to tape system, key to punched card.
- Source data input :
Point of Sale terminals, laser beam scanners, optical sense readers, optical character readers, magnetic ink character readers.
- Output Devices : Hard copy device - Dot matrix printer, impact printers, thermal printers, ink jet printers, laser printers, photographic printers, computer output microform (COM), punched Output, plotter output; spooling.
- Soft copy Devices : VDU (Monochrome & Colour), LCD (Liquid Crystal Display), Audio response unit : Micro films.
- CPU Architecture/ALU : Instruction execution, Fetch and execution cycles, Control unit Micro-programming concept, speed mismatch between CPU and memory.
- Memory Devices : RAM, ROM, PROM, EPROM, ECC RAM, EDO RAM and their specifications, memory storage locations, use of memory addressing in programming.
- Secondary Memory Devices : Floppy disk, hard disk removable/fixed), magnetic tapes, concept of cylinders, tracks and sectors, advantage and limitations of secondary storage, access time, access methods (sequential, direct, indexed; CD-ROM)

Software Concepts :

- Applications vs. system software, compiler, interpreter, Multiuser, multitasking operating systems.

Unit-III. Introduction to Personal Computers/Micro computers and operating systems (Basic Shell commands of UNIX, WINDOWS-95, MSDOS, NETWARE) (T-20,P-180)

Introduction to -

PC, PC/XT, PC/AT, Super AT, Minimum hardware and software configuration of the above.

DOS/WINDOWS commands -

- Profiling an Operating System
- Booting Sequence : Operating System files, and Command Processor file.
- Definition of a file : File names
- Booting from floppy and HDD
- Warm and Cold reboot
- Types of DOS commands : Internal and External - Introduction to AUTOEXEC.BAT.
- Different versions of MS-DOS.
- Directory commands : DIR, MD, RD, TREE PATH, SUBST.
- Wildcards Definition
- File Management commands : COPY, XCOPY, DEL.RENAME, ATTRIB, BACKUP, RESTORE, FIND, SYS.
- General commands : TYPE, DATE TIME, PROMPT
- Disk Organisation
- Disk Storage Capacity
- Sectors in a disk, Diskette Compatibility
- Boot Record
- Disk Partitioning and Master Boot Record
- File Allocation Table (FAT)
- Disk Management Commands : FORMAT, CHKDSK, DISKCOPY LABEL, VOL, DISKCOMP, COMP.RECOVER.
- Redirecting Command input and output
- Pipes
- EDLIN Editor commands
- Using COPY CON to build a file
- Introduction to simple batch files
- Configuring the system : CONFIG.SYS and AUTOEXEC.BAT FILES
- Setting the Environment : SET Command
- System Configuration : FILES, BUFFERS, COUNTRY SHELL, LASTDRIVE
- Batch files commands : ECHO, PAUSE, REM
- Batch files with commands line arguments
- Single and Multiple command line parameters.
- Loop Structures in Batch files
- Nested Batch Files
- Preparing Batch files
- Preparing Batch File Menu Shell
- DOS Utility Commands : MEMMAKER, MSAV, DBLSPACE, MOVE, DEFRAG, DELTREE, MSBACKUP, SCANDISK, SETVER, UNDELETE, UNFORMAT, XCOPY.

Using WINDOWS

- Start Windows
- Using different windows simultaneously
- Moving through windows and mouse
- Maximize/Minimize Windows
- Use of help feature
- Exit Windows
- Starting an application
- Run and Manage multiple applications
- Close applications

Using the Program Manager

- Create/Add Groups using Program Manager
- Move/copy/Delete Program Items
- Change Program Item properties

- Delete groups
- Open File Manager
- Expand compressed directories and files
- Open and manage multiple director windows
- View and sort files
- Save File Manager Settings
- Exist File Manager

File Management Through WINDOWS

- Select Files and Directories
- Copy, Move, Delete, Files/Directories
- Creating and renaming Files/Directories
- Disk Operations Using File Manager

Using Essential Accessories

- Starting and Using Write
- Type and Edit text in a document in Write
- Insert pictures in a document in Write
- Format text in Write document
- Save and Print a document file in Write
- Starting and using Paintbrush
- Printing a drawing

BASIC SHELL COMMANDS OF UNIX

Communication & N/W Concepts :

- Concepts of batch vs. on line environment.
- Single user va. multiuser environment, multi testing and multi-processing.
- Network Management Concept
- Concept of batch files in MSDOS utility disk drefragmanter; virus scane & Removal

Unit-IV : Concepts of Information & Data processing (T-20)

- Information concepts and processing : Evolution of Information Processing, data, information, Language and Communication.
- Definition of Information : difference between Data and Information (analogous to raw material or/and finished product).
- Value of Information : Relevance to receiver, decision-making potential.
- Data concepts : symbols which describe record reality : logical and physical concepts.
- Logical concepts of data : Entities, Attributes and Relationships.
- Physical concepts : Storage and retrieval of data : comparision of manual and computer storage and organisation of data as files.
- Techniques/Methods of Data Processing.

MODULE - II (T-210, P-800)

Unit-I Programming Practices & Techniques (T-25)

- Data capture and validation, Data entry package (software & Practice)
- Input form design, data editing, key to disk system, validation & control)
- Laboratory exercises on data-entry (speed 8000 characters hrs.) tele-typewriter, video display terminal, dot matrix printers.
- Exercise on data collection, data valuation and data verification.
- Exercise on transferring data from one medium to another/including back-up & Restore.

Unit-II Program design & logic (T-25)

- Problem analysis, evolution using step wise refinement Algorithm, Data Flow Diagrams, structure charts, decision tables, pseudo coding, More emphasis on flow charts and its symbols.
- Illustrations with summing series, sorting, searching merging Analysis of algorithms- space and time trade offs. Programme documentation, style in programming, program testing. Flow charts and Data Flow Diagrams. Program testing and debugging efficient programming techniques. Structured programming.

Unit-III COBOL (T:40, P : 250)

Introduction to COBOL

Overview of COBOL

- History of COBOL
- Coding format of COBOL Program
- Continuation lines
- Structure of a COBOL Program
- Character Set recognised by COBOL
- COBOL words
- Formation of COBOL words
- Types of COBOL words
- Constants and Identifies
- Numeric Literals
- Figurative Constants
- Data names and Identifiers

Identification Division & Environment Division

Identification Division

- Program-id Paragraph
- Documentation Paragraph
- Environment Division
- Configuration Section
- Input-Output Section
- File Control Paragraph
- File Control Paragraph
- Clauses like-Select, Assign, Organisation, Access Mode

Data Division

- FD, LABEL, BLOCK CONTAINS, RECORD CONTAINS, VALUE OF FILE-ID
- LINAGE, FOOTING AT, LINES AT TOP, LINES AT BOTTOM
- Record Description Entries
- Levels of Data 01-49,66,88
- Picture Clauses.

- Editing characters Clauses like VALUE, USAGE, SIGN IS, BLANK WHEN ZERO, JUSTIFIED RENAMES REDEFINES, OCCURS.
- WORKING SECTION level 77

Procedure Division

Structure of the Procedure Division

- Data Movement verbs
- Move
- Move Corresponding
- Arithmetic verbs
- ADD, SUBTRACT, MULTIPLY, DIVIDE, COMPUTEROUNDED AND ON SIZE ERROR OPTION
- Sequence control and Conditional verbs.
- PERFORM, PERFORM-THRU-UNTIL-TIMES-VARYING-FROM-AFTER
- IF ELSE IF Simple Compound-nested If relational Condition, Sign Condition, Class Condition Condition name condition.
- SEARCH, SEARCH ALL, STOP RUN

INPUT-OUTPUT verbs

ACCEPT DISPLAY

- OPEN-INPUT, OUTPUT, INPUT-OUTPUT EXTENDED
- DREAD-AT END, INVALID KEY, NEXT
- WRITE-ADVANCING-AT BOF-INVALID KEY
- REWRITE-INVALID KEY
- DELETE-IN VALID KEY
- START-KEY IS-INVALID KEY
- CLOSE

FILE HANDLING

- Sequential Files
- Blocking factor, Buffer size RESERVE clause, FILE STATUS clause CODE SET CLAUSE
- FD entry for fixed length records and variable length records.
- I.O.CONTROL paragraph-Clauses like RETURN SAME AREA
- Declaratives and FILE STATUS Clauses, USE statement
- Sorting and Merging of Files.
- Sort verb RELEASE and RETURN verbs, USING and GIVING option, INPUT PROCEDURE, OUTPUT PROCEDURE.
- Updating of Files, File matching
- MERGE verb

DIRECT ACCESS FILES

- Relative files
- Indexed sequential files
- Selection of file organisation.

CHARACTER HANDLING INSPECT

- STRING AND UNSTRING VERBS
- ### COBOL FOR PERSONAL COMPUTERS
- Screen Section and ACCEPT/DISPLAY verbs
 - Scrolling and non-scrolling modes
 - ACCEPT/DISPLAY verbs with position specification
 - ACCEPT/DISPLAY verbs with screen section

OTHER FEATURES OF COBOL 85

- Introduction
- Major improvement features
- Program structure

- Re-editing
- Relational Condition, Class Condition
- Redefines clause
- INITIALIZE verb, INSPECT verb with CONVERTING OPTION CONTINUE verb, Enhancement of conditional verbs, EVALUATE verbs, PERFORM with TEST phrase.
- File Handling

COBOL SUBROUTINES

- General Features
- PROCEDURE DIVISION with USING phrase
- LINKAGE SECTION
- CALL CANCEL AND EXIST PROGRAM
- Inter-program Communication in Personal Computer
- Non-numeric Literals

Unit-IV Programming and problem solving through C++ (T : 80 P : 280)

- Over view of programming : Introduction to Computer based problem solving and strategies for the same, Programme Design and Implementation issue, Algorithm, Data organisation, Data Structures. Use of procedures for Modular Design, documentation of programs and program testing.
- Fundamental of C++ Programming : Structure of C++ programming Data type, Data Structure, Constants and variables.
- Operations : Arithmetic, Relation and Logical, control if-then, for while.
- Arrays : Array declaration, one and two dimensional array -
- Function : General, function arguments, return value
- Basic I/O : Formatted and unformatted I/O
- Advanced Programming Techniques
- Dynamic Data Structures in C
- Miscellaneous features : File handling, C Preprocessor, C standard library and Header File.

Unit-V Introduction to Business Organisation (T : 40, P : 250)

- Introduction to business organisation and their need.
- Introduction to data processing : records and files : Data collection preparation, verification, editing and checking.
- Business files-master, processing sorting searching, merging, summarising Business Files-Master and Transactional Files : file generation back-ups files recovery procedures.
- Introduction to Accounting and Financial Management Types of accounts, books of accounts, simple accounting entries etc.

Computer Applications :

- Financial Accounting
- Pay Roll & invoicing application
- Budgeting and Planning.
- Cost Accounting.
- Inventory and State Control
- Sales Accounting and Sales Analysis etc.

Module III (T : 150, P : 300)

Unit-I Office Automation Package (T-40, P-80)

WORD PROCESSING PACKAGE

Basics of Word Processing

- Text Selection
- Opening Documents and Creating Documents
- Saving Documents/Quitting Documents
- Cursor Control
- Printing Documents
- Using the Interface (Menu, Toolbars)
- Editing Text (Copy, Delete, Move etc)
- Finding and Replacing Text
- Spell Check Feature/Autocorrect Feature, Grammar Facility
- Auto text, Character formatting, Page Formatting.

DOCUMENT ENHANCEMENT

- Adding Borders and Shading, Headers and Footers.
- Setting Up Multiple Columns, Sorting blocks, Margins and Hyphenating Documents.
- Creating Master Document, Data Source
- Merging Documents
- Using Mailmerge Feature for Labels and Envelopes

Graphics and Using Templates and Wizards.

Hands-on experience in Word processing under DOS including Wordstar.

Familiarity in Word Processing under Windows including Word pro.

Lotus Smartsuite and MS office.

Unit-II SPREADSHEET PACKAGE (T : 40, P : 100)

Using of MS- Excel,lotus Smartsuite, Lotus 1-2-3

Worksheet Basics

- Data Entry in Cells, entry of numbers,text and Formulae
- Moving data in a Worksheet
- Moving Around in a Worksheet
- Selecting Data Range
- Using the Interface (Toolbars, Menus)
- Editing basics
- Working with Workbooks
- Saving and Quitting
- Cell Referencing

Formatting and Calculations

- Calculations and worksheets - Using Autofill
- Working with Formylae
- Efficient Data Display with Data Formatting (number formatting, Data formatting etc.)
- Working with Ranges
- worksheets printing

Working with Graphs and Charts

- Adding / Formatting Text Data with Autoformat
- Creating Embedded Chart Using Chart wizard
- Sizing and Moving Parts
- Updating Charts
- Changing Chart Types
- Creating Separate Chart Sheet

- Adding Titles, Legends and Gridlines
- Printing Charts

Database management

- Finding Records with Data Form
- Adding / Deleting Records
- Filtering Records in a Worksheet

Unit -III Xbase Packages (T : 40, P : 120)

Contents :

- Concept of Data Base Management System
- Difference between data files and database files
- Fox Pro / dBASE III Plus
- Creating Data Base Files and Structures
- Editing Data Base Files
- Record pointer positioning features
- Specific record locating features
- Information display commands
- Indexed files
- Create, Delete, Save and recall memory variables
- Using in-built report-generation facility
- Using label facility
- Format files
- Using various functions available.

Advanced features (e.g. interfacing dBASE with Word Multiplan, Lotus 1-2-3, Symphony etc.)

Developing programmes for commercial application using Windows based, X-Base package.

Unit - IV AN OVERVIEW OF SELECTED PACKAGES (T- 40, P- 120)

- Desktop Publishing
- Office Automation with MS-Office
- Popular packages on Communication like CCMAIL, PRUCOMPLUS etc.
- Computer Viruses
- Presentation Graphics Features of Harvard Graphics, Printmaster Coral DRAW, Powerpoint etc.
- Multimedia / Animation package.

Unit-V Computer and Communication : (T-15, P-44)

Computer Network, Communication Services across network protocols : LAN WAN, E-Mail, Internet facilities through WWW, Mosaic, Gopher and element of JAVA, Computer System : Single/Multiuser, Work Station, Client-Serve, Introduction to video conferencing.

HARDWARE REQUIREMENT FOR COMPUTER OPERATOR & PROGRAMMING ASSISTANT

1. File Server for the Lan
Pentium @ 133 MHZ
With PCI CARD
32 MB Ram
2 GB HDD
CTD
1.44 MB FDD
VGA MONO MONITOR
101 KEY BOARD
16 BIT ETHERNET CARD
NODES
2. WORKSTATION/NODES
486 DX 4 @ MHZ OR PANTIUM
8 MB RAM

1.44 MB (3½") FDD

VGA COLOUR MONITOR
101" KEYBOARD
MICROSOFT SERIAL MOUSE
16 BIT ETHERNET CARD
3. WORKSTATION FOR MULTIMEDIA
PENTIUM @ 100 MHZ
16 MB RAM
SVGA COLOUR MONITOR
CD-ROM DRIVE
1 GB HD
1.44 FDD
101 KEYBOARD
SOUND CARD & SPEALERS + MICROPHONE
FAX MODEM CARD CONNECTED THROUGH
TELEPHONE LINE WITH VSNL CONNECTION FOR
WWW/INTERNET
MICROSOFT SERIAL MOUSE
4. 8-PORTHUB FOR LAN
5. RJ 45 CONNECTORS, CAT 3 CABLE FOR LAN
6. NOVEL NETWARE 3,12 OR HIGHER 20 USER
(Academic version preferably)
7. 1 KVA ON-LINE UPS FOR SERVER
8. 625 VA OFF-LINE UPS FOR NODES
9. 132 COLUMN DMP PRINTER (9 PIN)
10. DESKJET PRINTER (COLOUR)
11. OPTICAL SCANNER (HAND HELD TYPE)
12. Floppy Diskette 100 No.3½" Cartidge type-5 No.

Note:- Latest version of hardware & software should be provided.

LIST OF OTHER ITEM/FURNITURE

1. Vacuum cleaner - 1 No.
2. Pigeon hole cabinet-18 compartments - 2 Nos
3. Chair and Table for the Instructor -1 No. each for class room & Lab.
4. Computer Table sunmica top 1050 x 650 x 750 mm with sliding tray for key board and one shelf for storage - 10 Nos
5. Operators chair (without arms mounted on castor, adjustable height, wheel, cushioned)- 20 Nos.
6. Thermometer
7. Door Mat - 1 No.
8. Wall Clock - 1 No.
9. Printer Table 650 x 500 x 750 mm - 3 No.
10. Window type Air conditioners 1.5 tons - 3 Nos.
11. Storage Cabinet 600 x 700 x 450 mm 1 No.
12. Optical scanner (hand held type)
13. Floppy Diskette 100 No. 3 x 1/2 cartridge type - 5 No.

Software

COBOL, MULTI PROGRAMMING OPERATING SYSTEMS (SCO UNIX or latest, WINDOWS 95 or latest, NETWARE)

MSDOS, X-BASE, LOTUS 1-2-3, and all standard IBM Software like MS-Office etc. Multimedia and animation package.

(a) Application Package-Inventory Control, Financial Statement, Sales Analysis, Data Entry.

(b) Additional equipment for institutes which are already conducting earlier courses and having equipment supplied through D.O.E.

Software

SCO UNIX, WINDOWS 95, MSDOS, X-BASE, LOTUS 1-2-3, and all standard IBM Software.

Application Package - Word processing, Inventory Control Financial Statement, Sales Analysis.

Note:-Latest version of Hardware & Software should be procured or local NIC centre may be consulted.