SYLLABUS FOR THE TRADE
OF

COMPUTER OPERATOR AND PROGRAMMING ASSISTANT
(SEMESTER PATTERN)

UNDER
CRAFTSMAN TRAINING SCHEME

Designed in : 2013

by

Goverenment. of India
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
Directorate General of Employment & Training
Ministry of Labour & Employment
EN 81, SECTOR – V, SALT LAKE CITY,
Kolkata – 700 091.

List of trade committee members approved the syllabus of semester system for the trade of *"COPA "* held on 10th January 2012 at Kubernagar ITI, Ahmedabad, Gujarat

Sr.No.	Name	Designation	Status
1	Shri Nikhilbhai Patel	Chairman, IMC ITI Kubernagar	Chairman
2	Shri S.A.Pandav	Joint Director, Employment & Training, Gandhinagar	Member
3	Shri K.N.Somashekaraiah	Principal, RVTI, Bengalore	Co-ordinator
4	Shri Hemant Singh	Training Officer	Member
5	Shri Sanjay Kumar Gupta	V.I (COPA)	Member
6	Shri Amit Shah	Principal system analyst	Member
7	Shri Samir Motwani	V P Operations	Member
8	Shri P.B.Vyas	Principal Calss-II	Member
9	Shri G.K.Wadhwa	Asst. Manager IT	Member
10	Shri H.D.Solanki	Group Instructor, COPA	Member
11	Smt. B.R.Naik	Group Instructor, COPA	Member
12	Shri M.N.Parmar	Group Instructor	Member
13	Shri P.A.Mistry	Principal, ITI Kubernagar, Ahmedabad	Member Secretary

List of members attended the Workshop to finalize the syllabi of existing CTS into Semester Pattern held from 6th to 10th May'2013 at CSTARI, Kolkata.

Sl. No.	Name & Designation	Organisation	Remarks
1.	R.N. Bandyopadhyaya, Director	CSTARI, Kolkata-91	Chairman
2.	K. L. Kuli, Joint Director of Training	CSTARI, Kolkata-91	Member
3.	K. Srinivasa Rao, Joint Director of Training	CSTARI, Kolkata-91	Member
4.	L.K. Muhkerjee, Deputy Director of Training	CSTARI, Kolkata-91	Member
5.	Ashoke Rarhi, Deputy Director of Training	ATI-EPI, Dehradun	Member
6.	N. Nath, Assistant Director of Training	CSTARI, Kolkata-91	Member
7.	S. Srinivasu, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
8.	Sharanappa, Assistant Director of Training	ATI-EPI, Hyderabad-13	Member
9.	Ramakrishne Gowda, Assistant Director of Training	FTI, Bangalore	Member
10.	Goutam Das Modak, Assistant Director of Trg./Principal	RVTI, Kolkata-91	Member
11.	Venketesh. Ch. , Principal	Govt. ITI, Dollygunj, Andaman & Nicobar Island	Member
12.	A.K. Ghate, Training Officer	ATI, Mumbai	Member
13.	V.B. Zumbre, Training Officer	ATI, Mumbai	Member
14.	P.M. Radhakrishna pillai, Training Officer	CTI, Chennai-32	Member
15.	A.Jayaraman, Training officer	CTI Chennai-32,	Member
16.	S. Bandyopadhyay, Training Officer	ATI, Kanpur	Member
17.	Suriya Kumari .K , Training Officer	RVTI, Kolkata-91	Member
18.	R.K. Bhattacharyya, Training Officer	RVTI, Trivandrum	Member
19.	Vijay Kumar, Training Officer	ATI, Ludhiana	Member
20.	Anil Kumar, Training Officer	ATI, Ludhiana	Member
21.	Sunil M.K. Training Officer	ATI, Kolkata	Member
22.	Devender, Training Officer	ATI, Kolkata	Member
23.	R. N. Manna, Training Officer	CSTARI, Kolkata-91	Member
24.	Mrs. S. Das, Training Officer	CSTARI, Kolkata-91	Member
25.	Jyoti Balwani, Training Officer	RVTI, Kolkata-91	Member
26.	Pragna H. Ravat, Training Officer	RVTI, Kolkata-91	Member
27.	Sarbojit Neogi, Vocational Instructor	RVTI, Kolkata-91	Member
28.	Nilotpal Saha, Vocational Instructor	I.T.I., Berhampore, Murshidabad, (W.B.)	Member
29.	Vijay Kumar, Data Entry Operator	RVTI, Kolkata-91	Member

GENERAL INFORMATION

1. Name of the Trade	:	**COMPUTER OPERATOR AND PROGRAMMING ASSISTANT**

2. N.C.O. Code No.   :

3. Duration of Craftsmen Training   : 1 year (Two Semesters)

4. Power norms   : 3.45 KW

5. Space norms   : 70 Sq. mt.

6. Entry Qualification   : Passed 10th class examination

7. Unit strength   : 20 Trainees

8. Instructors Qualification   : Passed MCA/ B-TECH/BE   in Computer Science/ Engineering/ Technology from recognized university   with 1year working experience in the relevant field. OR

Passed 3 years Diploma in Computer Science / Engineering / Technology from recognized board or institution with 2 years working experience in the relevant field. OR

Passed BCA/BSc Computer Science/ DOEACC A Level from recognized university   with 2 years working experience in the relevant field. OR

NAC or NTC holder in relevant trades with three years Experience

9. Desirable qualification   : Preference to be given CIC (Craft instructor Certificate) holders.

At least one Instructor must have Degree / Diploma in relevant field

Syllabus for the Trade of "COMPUTER OPERATOR AND PROGRAMMING ASSISTANT" Under C.T.S.

Duration : Six Months

First Semester
Semester Code : COP : SEM I

Week	Trade Practical	Trade Theory
1	Using WINDOWS ☐ Start windows ☐ Using different windows simultaneously ☐ Moving through widows and mouse ☐ Maximum/Minimum windows ☐ Use of help feature ☐ Exit windows ☐ Starting an application ☐ Run and Manage multiple application ☐ Close applications Using the program Manager ☐ Create/Add Groups using Program Manager ☐ Move/Copy/Delete Program Items. ☐ Change Programmed/their properties ☐ Expand compressed directories and files ☐ Multiple Windows	History of Computer ☐ Abacus of ENIAC, Computer Generations, Languages, Software and application, Computers in India. Computers - An Introduction ☐ Functions of Computer: input, processing, output, Functions of ALU, control, storage, input and output devices. ☐ Application of Computers: viz. Railway Reservation, Electricity / Telephone Billing and (include some e-governance applications according to respective States.) ☐ Networks of Computers- Homogenous, Heterogeneous Characteristics (State Wide Area Network (SWAN) concept) ☐ Clock Speed ☐ Accuracy
2-3	Using the program Manager ☐ Create/Add Groups using Program Manager ☐ Move/Copy/Delete Program Items. ☐ Change Programmed/their properties ☐ Expand compressed directories and files ☐ Multiple Windows Using Desktop ICONS ☐ My Computer ☐ Network Neighborhood ☐ Control Panel ☐ Add Printer ☐ Create/Delete/Rename/Folder File Management through Windows ☐ Select File snag Directories ☐ Copy, Move, Delete, Files/Directories ☐ Disk Operations using File Manage	Functions ☐ Bits, bytes characters, field record, file. Representation of data: ☐ Binary addition and subtraction, octal, hexadecimal, ASCII, EBCDIC, positive versus negative integers, floating point numbers. ☐ Higher level and Lower language.

	Using Essential Accessories ☐ Starting and Using Text Editors ☐ Type and Edit text in a document in Text Editors 9 ☐ Save and Print a document file in Text Editors ☐ Starting and using paintbrush ☐ Printing a drawing	
4	Basic Shell Commands of LINUX ☐ Date, echo, who, is, cp, rm, mv, cd,	Computer Hardware; electronic digital computer. ☐ Input device: on line data input devices & their importance, dumb terminals, voice recognition devices, Touch tone terminals, Mouse. ☐ Office data input: key to disk system
5	☐ Mk dir, rm dir, chmod, sort, grep, passwd, etc.	Source data input: point of sale terminals, laser beam scanners, optical sense readers, optical characters readers (OCR), and magnetic ink character readers (MICR). ☐ Output device: Hard copy device -Dot matrix printer, ink jet printer, laser printer, plotter output.
6-7	Designing web-pages(Static)	Soft copy device: VDU (monochrome color), LCD (liquid crystal display), audio response unit; ☐ CPU architecture: Overview with data flow ☐ Memory device: Classification of Primary Memory Devices and Flash Memories. ☐ Secondary memory device; Hard disk (removable/fixed), advantage and limitations of secondary storage devices & DVD Writers or Blu-ray Writers. ☐ Removable Drive like Pen drives and external storage devices. ☐ Serial, Parallel and USB Ports.
8-9	Setup the Internet Connection & Sharing(Proxy Setup &Leased Line Setup)	Internet connection setup & sharing. ☐ Protocols TCP/IP, ISP, NSP ETC.
9	Designing web-pages, Static & Dynamic.	☐ Concept of sites & pages ☐ Introduction to HTML, DHTML,XML,
10-11	Concepts of Web Hosting, Web server, Application server, Database Server	Information concepts and processing: Evolution of Information Processing, data information, language and Communication. ☐ Definition of Information: difference between Data and Information. ☐ Data concepts: symbols which describe records reality: logical and physical

		concepts.
		☐ Logical concepts of data: Entities, Attributes and Relationship.
		☐ Physical concepts: Storage and Retrieval of data; comparison of manual and computer storage and organization of data as files.
		☐ Data processing: Storage, retrieval and processing of data as files.
		☐ Data processing: Storage, retrieval and processing of data, provision of Information of relevance.
		☐ Techniques/Methods of Data processing.
		☐ Methods of Data Security like backup, online backup, restoration etc
12-14	Measuring Main Supply, Earth voltage & checking earthing. ☐ Precautionary measures in Handling /Operating. - VCD, CD, HDD, FDD, DVD, SCANNER - Modem, Keyboard, Mouse, Hub, Monitor ☐ Printers: Dot Matrix, Inkjet, Laser - Feeding paper - Installing the cartridge - Refilling the cartridge. ☐ Backup and Restore of DATA - Scheduling - Management Plans etc.	Flow Charts ☐ Illustrations with summing series, sorting, searching merging Analysis of algorithms-space and time tradeoffs. Program documentation, style in programming, program testing, low chart and Data flow Diagrams. ☐ Program testing and debugging efficient programming techniques Structured programming
15-16	Basic C Programming	Introduction to C ☐ Overview of C ☐ Constants, Variables, and Data type ☐ Operators and Expression ☐ Managing Formatted / Unformatted Input and Output
17-18	Programming On C on control structures(if-else, switch case, Loops etc.) Arrays	Decision making and Branching ☐ Decision Making looping ☐ Arrays
19-21	Programming On C on Strings, Functions	☐ Handling of Character Strings ☐ User defined Functions
22-23	Programming On C on Pointers, structures and unions	Structures and Unions ☐ Pointers ☐ File management in concepts
24	Employability Skill	
25	Project work /Industrial Visit (optional)	
26	Examination	

Second Semester
Semester Code : COP : SEM II

Week	Trade Practical	Trade Theory
1-2	Basics of Word processing ☐ Text selection ☐ Opening Documents and Creating Documents ☐ Saving Documents/Quitting Documents ☐ Cursor control ☐ Programming on Creating Simple Applications in VB	Approaching ASP.NET starting with Visual Basic .NET Features of Visual Basic , Editions of Visual Basic, Visual Basic Terminology ☐ Visual Basic Terminology, Working in the development environment ☐ Event-Driven Programming ☐ Creating a program in Visual Basic, project and executable files ☐ Visual Basic Reference Materials
3-4	Printing Documents ☐ Using the interface(Menu, toolbars) ☐ Editing Text (Copy, delete, Move etc.) ☐ Finding and replacing Text	Visual Basic.NET Fundamentals. Introduction to Objects ☐ Controlling objects ☐ Properties , Methods and Events ☐ Working with Forms ☐ Introduction to controls ☐ Basic controls ☐ Creating a Visual Basic Applications
5-6	☐ Practicing in Regional Language. Document Enhancement ☐ Adding borders and shading, Headers and Footers Setting Up Multiple columns, Sorting blocks, margins and hyphenating documents Programming on VB.Net	Working with Code and Forms ☐ Automatic Code completion features ☐ Interfacing with the user ☐ Using the Message box Functions ☐ Using the Input box functions ☐ Working with code statements ☐ Managing forms ☐ Working with Forms
7-8	☐ Creating Master Document, Data source ☐ Merging Documents ☐ Using mail merge Feature for Labels and envelopes Graphics and using Templates and Wizards Revision & Sessional Exam Programming on VB.Net	Overview of variables ☐ Declaring Variables ☐ Variable scope ☐ Using Arrays ☐ User-Defined data types ☐ converting data types ☐ Using Constants ☐ Working with Procedures ☐ Working with dates and times ☐ Using the Format function ☐ Manipulating Text strings ☐ Writing Procedures
9-10	Usage of Ms-Excel Worksheet Basics ☐ Data Entry in cells, entry of numbers, text and Formulae	Comparison and Logical Operators ☐ Using If….Then Statements ☐ Using select…case statements ☐ Overview of Looping structures

	☐ Moving data in a Worksheet ☐ Moving around in a Worksheet ☐ Selecting Data range ☐ Using the interface(Toolbars, Minus) ☐ Editing basics ☐ Working with workbooks ☐ Saving and quitting ☐ Cell Referencing Programming on VB.Net	☐ Using Do…Loop structures ☐ For…Next Statement ☐ Exiting a Loop ☐ Controlling Program Flow While, Do While, Else If loop, SWITCH Case
11-12	Calculations and Worksheets-Using Auto fill ☐ Working with formulae ☐ Efficient Data Display with Data formatting number formatting etc./ ☐ Working with ranges ☐ Worksheets printing Programming on ASP.Net	Types of Errors ☐ Break Mode ☐ Using the Debug Toolbar ☐ Using the Watch Window ☐ Using the Immediate Window ☐ Using the locals window ☐ Tracing Program Flow with the call stack ☐ Using visual Basic debugging tools
13	Adding/Formatting Text data with Auto format ☐ Changing chart types ☐ Creating separate, chat sheet ☐ Adding titles, legends and gridlines ☐ Printing charts. Programming on ASP.Net	Types of controls ☐ Overview of Standard Controls o Using combo box and list Box controls ☐ Using option button and Frame Control
14	Finding Records With Data form ☐ Adding/Deleting records. ☐ Filtering records in a worksheet Programming on ASP.Net	☐ working with selected text ☐ Advanced Standard Controls ☐ Activex controls ☐ Insertable Objects ☐ Working with controls ☐ Login, Validation & Navigation Control
15	Programming on ASP.Net	Overview of Activex Data objects ☐ Visual Basic data Access Features ☐ Relational Database concepts ☐ Using the ADO Data control to access data ☐ Structured Query Language (SQL) ☐ SQL connection ☐ Manipulated Data ☐ Using the Data Form Wizard ☐ Accessing Databases ☐ Back up & Restore Procedure
16	Programming on ASP.Net	Field – Level Validation ☐ Using Text Box Properties to Restrict Data Entry

		□ Using the Masked Edit Control □ Form-Level Validation □ Form Events Used When Validating Data
17	Programming on ASP.Net	Overview of Run-Time Errors □ Overview of the Error -0 Handling Process □ The Err Object □ Errors and the Calling Chain □ Errors in an Error-Handling Routine Exception Handling □ Inline Error Handling □ Error – Handling Styles □ General Error – Trapping Options in Visual Basic.NET □ Error Trapping - Exception Handling
18	Programming on ASP.Net	Menus □ Status Bars □ Toolbars □ Adding Menus - Hyperlink Drag-and-Drop Operations □ Overview of Drag-and-Drop Features □ Mouse Events □ Drag-and-Drop Editing Basics □ Adding Drag and Drop
19-20	Programming on ASP.Net	Collections □ Using Control Arrays Finishing Touches □ User Interface Design Principles □ Distributing and Application □ Creating a Default Project □ Review: Steps to Creating a Visual Basic Program □ Development Resources □ Using the Package and Development Wizard - Web Services
21	Practice on My SQL Creating Tables, Inserting Data in a Table, Using simple query	X-base package (T-55, P-200) - using MySQL and MS-Access □ What is Database Management System (RDBMS) and Relational Database Management System (RDBMS)
22	Practice on My SQL Updation, Deletion query	o □ Introduction to SQL o What is SQL? o Data Definition Language (DDL) and Data Manipulation Language (DML)

23	Practice on MS Access Creating Table, From	Introduction to Atomic Concurrent Integrated Durable (ACID) Properties. ☐ Expression o Select commands o Using Numeric, Concatenation operator, Date, Dual Table, null values
24	Practice on MS Access Query, Report	Awareness of IT –Act 2000, its Amendments and Phenomena (T-5) ☐ Provisions of act ☐ Types of offences, fines, imprisonment ☐ Cyber Crime, Cyber Law ☐ E-Commerce Basics (Overview of B2B, B2C, C2C), Online transactions
25	Revision	
26	Examination	

TRADE: COMPUTER OPERATOR AND PROGRAMMING ASSISTANT
LIST OF TOOLS & EQUIPMENT

A. TRAINEES TOOL KIT FOR 16 TRAINEES

SL. No.	Name of the items	Quantity
1	Laptop : i3 2nd generation processor or equivalent and above with major minimum features as below:- 1) Speed :- 2.1 GHz or Higher. 2)Cache Memory : - Minimum 3 MB or better. 3)RAM :- 4 GB DDR-III or Higher. 4)Hard Disk Drive :- 500GB or Higher,5400 rpm(minimum) or Higher, WiFi Connectivity. 5) Network Card : Integrated Gigabit Ethernet(10/100/1000). 6) Paper Licensed Operating System / OEM Pack(Preloaded). 7)Antivirus / Total Security – 01 NO.	1 No.
2	Server for LAN Xeon Latest 32/64 bit processor or Higher with PCI Express Video Card 4GB VRAM 4 GB RAM or higher 22" TFT Keyboard, Mouse, DVD OR BLU-RAY WRITER with latest license of OS - Server Edition Internet, Antivirus - Server Edition & UPS for Power Back up.	01 No
3	WORKSTATION/NODES : 2nd Generation Core i3 Processor or Equivalent and above with major minimum features as below : 1) 32/64 Bit Processor (3.06 GHz or Higher,4 MB 4-Core) or Higher. 2) Network Card : Integrated Gigabit Ethernet(10/100/1000). 3) RAM : 2 GB or Higher. 4) 320 GB / 500 GB HDD or Higher. 5) 19'' TFT Monitor 6) DVD Writer 7) PS2 / USB KeyBoard , USB/Optical Mouse with latest Paper Licensed Operating System / OEM Pack(Preloaded) Professional/Ultimate Edition with Internet Facility.	10 Nos
4	24 PORT SWITCH WITH WIRELESS CONNECTIVITY	As required
5	LAB should have Structured cabling	As required
6	Internet or Intranet Connectivity	As required
7	RJ 45 CONNECTORS	As required
8	CAT-6 CABLE FOR LAN	As required
9	500 VA or higher off – line UPS FOR NODES	10 No's
10	LASER PRINTER	1 No
11	Network MONOCHROME LASER PRINTER	1 No
12	OPTICAL SCANNER (DESK TOP TYPE)	1 No
13	WEB CAM (DIGITAL CAMERA)	
14	DVD OR BLU-RAY WRITER	2 Nos

15	Standalone HARD DISKS	4 Nos
16	LCD PROJECTOR	1 No
17	Network Rack	2 Nos
18	LAN Setup	As required
19	Data Recovery Software	As required
20	DSL Wireless Router	01 No
21	Wireless Router	01 No
B. SOFTWARE		
1	Software: OS, VISUAL STUDIO, Linux or any Open Source Software., Turbo C , JVM Antivirus for - clients / workstations in profile with validity of a year or more that can be procured on expiry. NOTE- LATEST VERSION OF HARDWARE AND SOFTWARE should be provided NOTE: ALL ABOVE WILL BE ACADEMIC VERSIONS EXCEPT FOR ANTIVIRUS	
C. LIST OF OTHER ITEMS/ FURNITURE		
1	Vacuum cleaner	01 No
2	Pigeon hole cabinet : 20 compartments	01 No
3	Chair and table for the instructor - 01 each (for class room & laboratory)	
4	Dual Desk or Chair and Tables for Trainees	10 Nos
5	Computer table sunmica top 150X650X750 mm with sliding tray for key board and one shelf of storage	10 Nos
6	Operators chair (without arms mounted on castor wheels, adjustable height	10 Nos
7	Wall clock	01 Nos
8	Printer table 650X500X750mm can be varied as per local specifications	03Nos
9	Window or Split type Air conditioners 1.5 tons	03Nos
10	Storage cabinet 60X700X450mm	01Nos
11	Inter active Board.	1 No.
12	2D Bar Code Reader	1 No.