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SYLLABUS FOR THE TRADE OF

COMPUTER OPERATOR AND PROGRAMMING ASSISTANT

(IT & ITES SECTOR)

Redesigned in 2014

by

Ministry of Labour and Employment
Directorate General of Employment and Training
New Delhi

GENERAL INFORMATION

1. Name of the Trade : COMPUTER OPERATOR AND PROGRAMMING ASSISTANT
2. N.C.O. Code No. : 4112.20, 3121.20
3. Duration of Craftsmen Training : 1 year (Two Semesters)
4. Power norms : 3.45 KW
5. Space norms : 70 Sq. m.
6. Entry Qualification : Passed 10th class examination
7. Unit strength : 20 Trainees
8. Instructors Qualifications : Degree in Computer Engineering/IT, MCA with one year of relevant experience OR Diploma in Computer Engineering /IT, BCA, NIELIT A Level with two years of relevant experience OR NTC/ NAC and National Craft Instructor Certificate in COPA Trade with three years of relevant experience after NAC/NTC.

Job Roles:

After completion of the course the trainees shall be qualified for one or more of the following job roles:

1. Office Automation.
2. Smart Accounting.
3. Web design and maintenance.
4. Computer maintenance.
5. Computer Training in schools and institutes.
6. Cyber Cafe setup and management.
7. IT online support

**Syllabus for the Trade of “COMPUTER OPERATOR AND PROGRAMMING ASSISTANT” Under
Craftsmen training Scheme.**

First Semester: Code no. COPA – 01

Duration:6 months (26 weeks)

Week No.	Trade Practical	Trade Theory
1-2	<p>Computer components and Windows Operating System</p> <ul style="list-style-type: none"> • Disassembling, Identification of components and Reassembling a Desktop computer. • Familiarization with Windows O.S desktop, using icons, buttons and customizing the desktop. • Managing files and folders, using removable drives. • Viewing system properties and control panel details. Viewing and setting environmental variables. • Working with MS Paint. 	<p>Introduction to Computers and Windows Operating System</p> <ul style="list-style-type: none"> • History, Generations, Types, Advantages and Applications of Computers. • Concepts of Hardware and Software. Computer Hardware basics. • Introduction to various processors. • Introduction to the functions of an Operating System, Popular Operating Systems in Use. • Main features of Windows O.S • Various Input/ Output devices in use and their features. • Using Scanner, Printer and Webcam.
3	<p>Computer Hardware basics and Software Installation</p> <ul style="list-style-type: none"> • Viewing the BIOS and changing the Boot order. • Identify and rectify common hardware and software issues. • Formatting the hard disk and loading O.S and necessary application software. • Installation of DVD, using different types of hard disks. • Bluetooth Configuration, DVD write techniques. 	<p>Computer Hardware basics and Software Installation</p> <ul style="list-style-type: none"> • Introduction to the booting process, BIOS settings and their modification. • Introduction to various types of memories and their features. • Basic Hardware and software issues and their solutions. • Formatting and Loading O.S and Application software and Antivirus.

4-5	<p>Familiarization with DOS CLI & Linux Operating Systems.</p> <ul style="list-style-type: none"> • Using basic DOS commands for directory listing, file and folder management etc. • Using Basic Linux commands for directory listing, file and folder management, password etc. • Using the Linux graphical user interface for file and folder management, exploring the system etc. 	<p>Introduction to DOS Command Line Interface & Linux Operating System.</p> <ul style="list-style-type: none"> • Introduction to basic DOS Internal and External Commands. • Introduction to Open Source Software. • Introduction to Linux Operating System features, structure, files and processes. • Introduction to various Linux Shells. • Basic Linux commands.
6-8	<p>Using Word Processing Software</p> <ul style="list-style-type: none"> • Familiarization with the Word window components. • Creating, saving and editing documents using Word. • Inserting and formatting tables and other objects. • Using templates, autocorrect tools, macros and the mail merge tool. • Working with Page layout settings and printing documents. • Typing practice using open source typing tutor tools. • Practice of using shortcut keys. 	<p>Word Processing</p> <ul style="list-style-type: none"> • Introduction to the various applications in office. • Introduction to Word features, Office button, toolbars. • Creating, saving and formatting and printing documents using Word. • Working with inserting objects, macro, mail merge, templates and other tools in Word. • Page setup and Printing Documents using word.
9-11	<p>Using Spread Sheet Application</p> <ul style="list-style-type: none"> • Creating, Saving and Formatting Excel Spreadsheets. • Using Absolute and Relative referencing, linking sheets, Conditional formatting etc. • Using Excel functions of all major categories. • Using various data types in Excel, Sorting, filtering and validating data. 	<p>Spread Sheet Application</p> <ul style="list-style-type: none"> • Introduction to Excel features and Data Types. • Cell referencing. Use of functions of various categories, linking Sheets. • Introduction to various functions in all categories of Excel. • Concepts of Sorting, Filtering and Validating Data. • Analyzing data using charts, data tables, pivot tables, goal

	<ul style="list-style-type: none"> • Creating and formatting charts. • Importing & Exporting Excel Data. • Performing data analysis using “what if” tools. • Modifying Excel Page setup and printing. • Simple projects using Excel & Word. 	<p>seeking and scenarios.</p> <ul style="list-style-type: none"> • Introduction to Reporting.
12	<p>Image editing, Creating presentations & Using Open Office</p> <ul style="list-style-type: none"> • Use of windows and open source image editing software like Open Office Draw, GIMP, Irfan View or a similar tool. • Creating Slide shows, Inserting objects. • Animating Slide transitions and Objects. • Creating a simple presentation project using Open Office. • Working with Open Office for word processing and spreadsheet application. 	<p>Image editing, Creating presentations & Using Open Office</p> <ul style="list-style-type: none"> • Introduction to Open Office. • Introduction to the properties and editing of images. • Introduction to Power Point and its advantages. • Creating Slide Shows. • Fine tuning the presentation and good presentation techniques.
13-15	<p>Database Management</p> <ul style="list-style-type: none"> • Creating database and designing a simple tables in Access. • Enforcing Integrity Constraints and modifying the properties of tables and fields. • Creating Relationships and joining tables. • Creating Forms. • Creating simple select queries with various criteria and calculations. • Creating Simple update, append, make table, delete and crosstab 	<p>Database Management Systems</p> <ul style="list-style-type: none"> • Concepts of Data, Information and Databases. Overview of popular databases, RDBMS, OODB and NOSQL. • Rules for designing good tables. Integrity rules and constraints in a table. • Relationships in tables. • Introduction to various types of Queries and their uses. • Designing Access Reports and Forms. • Introduction to macros, designer objects controls, their properties

	<p>queries.</p> <ul style="list-style-type: none"> • Modifying form design with controls, macros and events. • Importing and exporting data to and from Access. • Compressing and Encrypting databases. 	and behavior.
16-17	<p>Configuring and Using Networks</p> <ul style="list-style-type: none"> • Viewing Network connections. • Connecting a computer to a network and sharing of Devices, files and Folders. • Familiarization with various Network devices, Connectors and Cables. • IP Addressing and Subnet for IPV4 / IPV6, Masking, pinging to test networks. • Configuring Hub and Switch. • Setting up and configuring LAN in a Computer Lab as peer to peer network. • Setting up a proxy server/ DHCP Server with firewall. • Setting up video conferencing. • Using various tools for computer maintenance, Network security. 	<p>Networking Concepts</p> <ul style="list-style-type: none"> • Introduction to Computer Networks, Necessity and Advantages. • Client Server and peer to Peer networking concepts. • Concept of Proxy Server and proxy firewall server. • Network topologies. Introduction to LAN, WAN and MAN. • Network components, viz. Modem, Hub, Switch, Router, Bridge, Gateway etc. • Network Cables, Wireless networks and Blue Tooth technology. • Concept of ISO - OSI 7 Layer Model. • Overview of various Network protocols Viz. TCP/IP, FTP, Telnet etc. • Logical and Physical Addresses, Classes of Networks. • Network Security & firewall concepts. • Concept of DHCP Server.
18	<p>Internet Concepts</p> <ul style="list-style-type: none"> • Browsing the Internet for information. • Creating and using e – mail for communication. • Communication using text, video chatting and social networking sites. • Identifying various threats to the system connected to the net. 	<p>Internet Concepts</p> <ul style="list-style-type: none"> • Introduction to WWW, Concept of Internet, Web Browsers, internet servers and search engines. • Concepts of Domain naming Systems and E mail communication. • Introduction to video chatting

	<ul style="list-style-type: none"> • Protecting the computer against various internet threats. • Configure Outlook, mail service in mobile phones. Using tools like Skype, Google+ etc. 	<p>tools, VOIP and Social Networking concepts.</p> <ul style="list-style-type: none"> • Concept of Cloud storage and Open Web Server. • Introduction to Internet Security, Threats and attacks, Malicious Software types, Internet security products and their advantages.
19-21	<p>Designing Static Web Pages</p> <ul style="list-style-type: none"> • Designing simple web pages with text, pictures, tables, lists, hyperlinks, frames, marquees etc. using HTML tags. • Designing Web Pages with Forms and Form Controls using HTML tags. • Creating Web Pages using CSS. • Using WYSIWYG web design tools to design and edit web pages with various styles. 	<p>Web Design Concepts</p> <ul style="list-style-type: none"> • Concepts of Static and Dynamic Web pages. • Introduction to HTML and various tags in HTML. • Creating Forms with controls using HTML. • Concepts of CSS and applying CSS to HTML • Introduction to open source CMS viz., Joomla, Wordpress etc. and Web authoring tools viz. Kompozer, FrontPage etc.
22-23	Project Work	
24-25	Examinations	
26	Admissions for the next session	

Week No.	Trade Practical	Trade Theory
1-7	<p>Java Script</p> <ul style="list-style-type: none"> • Familiarization with JavaScript elements. • Embedding JavaScript in HTML to display information in web pages. Documentation and Formatting. • Using JavaScript Variables, Data types, Constants and Operators. • Working with Arrays, Control statements and Loops in JavaScript. • Writing functions in JavaScript. • Working with String, Math and Date functions in JavaScript. • Switch, Loops, Breaks and Errors. • Using Java Script Objects. • Working with JavaScript Libraries. • Using simple Open source web server (like XAMPP) and FTP software (For ex. Filezilla). • A simple project using JavaScript. 	<p>Java Script</p> <ul style="list-style-type: none"> • Algorithms and flowcharts. • Introduction to Web Servers and their features. • Introduction to Programming and Scripting Languages. • Introduction to JavaScript and its application for the web. • JavaScript Basics – Data types, Variables, Constants. Conversion between data types. • The Arithmetic, Comparison, Logical and String Operators in JavaScript. Operator precedence. • Arrays in JavaScript – concepts, types and usage. • Program Control Statements and loops in JavaScript. • Introduction to Functions in JavaScript. • Built in JavaScript functions overview. • The String data type in JavaScript. Introduction to String, Math and Date Functions. • Concepts of Pop Up boxes in JavaScript. • Introduction to the Document Object Model.
8– 15	<p>Programming with VBA</p> <ul style="list-style-type: none"> • Familiarization with the VBA Editor. • Writing simple programs involving VBA Data types, Variables, Operators and Constants. • Working with string variables in 	<p>Introduction to VBA, Features and Applications.</p> <ul style="list-style-type: none"> • Introduction to VBA features and applications. • VBA Data types, Variables and Constants. • Operators in VBA and operator

	<p>VBA.</p> <ul style="list-style-type: none"> • Creating and Manipulating Arrays in VBA. • Writing programs involving Mathematical, Conversion, Date and String Functions in VBA. • Working with conditional statements like If. Elseif, Select ... Case statements in VBA. • Writing programs in involving Loops. • Creating Message boxes and Input boxes in VBA. • Creating Functions and Procedures. Passing Parameters and Using Returned Data. • Using VBA built in functions in programs. • Creating and editing macros. • Writing code to work with Excel VBA forms and form controls like buttons, Checkboxes, Labels, ComboBox, GroupBox, ListBox, Option Button, Scroll Bar and Spin button. Modification of object properties. • Using ActiveX controls. • Programming with methods and events. • Debugging, Stepping Through Code, Breakpoints, Finding and Fixing Errors. • A simple project involving MS excel and VBA. 	<p>precedence.</p> <ul style="list-style-type: none"> • Mathematical Expressions in VBA. • Introduction to Strings in VBA. • Introduction to Arrays in VBA. • Conditional processing in VBA, using the IF, Elseif, Select... Case Statements. • Loops in VBA Introduction to VBA. • VBA message boxes and input boxes. • Introduction to Creating functions and Procedures in VBA. • Using the built in functions. • Creating and editing macros. • Introduction to Object Oriented Programming Concepts. Concepts of Classes, Objects, Properties and Methods. • Events and Event driven programming concepts. • The user forms and control in Excel VBA. • Properties, events and methods associated with the Button, Check Box, Label, ComboBox, Group Box, Option Button, List Box, Scroll Bar and Spin button controls. • Overview of ActiveX Data objects. • Debugging Techniques.
16-19	<p>Using Accounting Software</p> <ul style="list-style-type: none"> • Basic accounting practice. • Familiarization with the Tally interface. • Company creation, Account Creation, Voucher Entry in Tally. • Report Generation (Creating 	<p>Smart Accounting</p> <ul style="list-style-type: none"> • Basics of Accounting, Golden Rules of Accounting, Voucher Entry, Ledger Posting, Final Accounts Preparation. • Cash Book. Ratio Analysis, Depreciation, Stock Management. • Analysis of VAT, Cash Flow, Fund

	<p>statements like Invoice, Bill, Profit & Loss account etc.).</p> <ul style="list-style-type: none"> • Performing Cost Centre & Cost Category management. • Managing Budgeting Systems. • Scenario management and Variance Analysis. • Using Tally for Costing, Ratio Analysis, Cash Flow, Funds Flow Statements. • Analyzing and Managing Inventory. • Performing Point of Sales and Taxation. Performing Systems Administration and using other Utilities, User creation, Backup & Restore of Company. • Using the Multilingual Functionality 	<p>FlowAccounting.</p> <ul style="list-style-type: none"> • Introduction to Tally, features and Advantages. • Implementing accounts in Tally. • Double entry system of bookkeeping. • Budgeting Systems, Scenario management and Variance Analysis. • Costing Systems, Concepts of Ratios, Analysis of financial statements, Inventory Basics, POS Invoicing, TDS, TCS, FBT, VAT & Service Tax Processing in Tally. • Tally Interface in Different Languages.
20	<p>E Commerce</p> <ul style="list-style-type: none"> • Familiarization with latest E commerce websites viz. E bay, Amazon, FlipCart, OLX, Quikr etc. and comparative study of the main features of these sites. • Using E Commerce Simulator Software for Marketplace Business Simulation. • Identifying and solving security issues in E-commerce and payment operations. 	<p>E Commerce</p> <ul style="list-style-type: none"> • Definition of E commerce, Types, scope and benefits of E commerce. • Difference between E commerce and traditional commerce. • Capabilities requirements and Technology issues for E commerce. • Types of E commerce web sites. • Building business on the net. • Concepts of on line Catalogues, Shopping carts, Checkout pages. • Payment and Order Processing, Authorization, Chargeback and other payment methods. • Security issues and payment gateways.
21	<p>Typing practice</p> <ul style="list-style-type: none"> • Typing Practice in Regional Language 	<p>Cyber Security:</p> <ul style="list-style-type: none"> • Overview of Information Security, Security threats, information Security

		<p>vulnerability and Risk management</p> <ul style="list-style-type: none"> • Introduction to Directory Services, Access Control, Software Development Security, Privacy protection, Audit and Security. • Introduction to I.T Act and penalties for cybercrimes.
22-23	Project Work	
24-25	Examinations	
26	Admissions for CITS	

Note: Syllabus for the subject of Employability Skills is common for all the trades

TRADE: COMPUTER OPERATOR AND PROGRAMMING ASSISTANT

LIST OF TOOLS & EQUIPMENT

TRAINEES EQUIPMENT/SOFTWARE/TOOLS AND FURNITURE FOR A BATCH OF 20 TRAINEES

SL.No	Name of the items	Quantity
1	Desktop Computers of the latest configuration prevalent at the time of procurement or with the following minimum features: CPU: 32/64 Bit Core 2 Duo/Quad Core/i3/i5, Speed: 3 GHz or Higher. Cache Memory: - Minimum 3 MB or better. RAM:-8 GB DDR-III or Higher. Hard Disk Drive: 500GB or Higher, 7200 rpm(minimum) or Higher, Wi-Fi Enabled. Network Card: Integrated Gigabit Ethernet(10/100/1000) - Wi-Fi, USB Mouse, USB Keyboard and Monitor (Min. 22 Inch), Standard Ports and connectors. DVD Writer, Speakers And Mic. Licensed Windows Operating System / OEM Pack(Preloaded), Antivirus / Total Security	10 Nos.
2	Laptop 4 th Gen Ci5 Processor, 4GB RAM, 1TB Hard Disk, Win8 Preloaded Licensed OS, 2GB Graphics Card, DVD Writer, Standard Ports And Connectors.	01 No
3	Wi-Fi Router / 24 Port Switch With Wireless Connectivity option	01 No
4	Lab should have Structured cabling (to enable working with Wired Networks too for Practical)	As required
5	Internet or Intranet Connectivity	As required
6	Laser Printer Monochrome A4 Size	1 No.
7	Network Monochrome Laser Printer A4 Size	1 No.
8	Optical Scanner (Flatbed A4)	1 No.
9	Digital Web Cam (High Resolution)	4 Nos.
10	DVD or Blu-Ray Writer	2 Nos.
11	LCD Projector with matte(antiglare) screen	1 No.
12	2KVA online UPS	2 Nos.

13	Cable crimping tool	1 No.
14	Standalone Hard Disks 500 GB or Higher	4 Nos.
15	Network Rack	1 No.
16	Barcode Scanner	1 No.
17	Digital Multimeters, 3.5 digit handheld type.	8 Nos.
18	Standard Screw Driver Set	10 Sets
19	USB Mini Dongle for Bluetooth devices Connection	6 Nos.
20	Bluetooth headphone & mic set	6 Nos
21	External Solid State Hard Disk 1 TB	2 Nos.
22	LAN Setup	As required
B. Software per Unit		
1	MS Office 2010 (professional) or the latest version available at the time of procurement	11 Licenses
2	Antivirus for – clients / workstations in profile with validity of an year or more which should be renewed upon expiry	11 Licenses
3	Open Office or equivalent.	Open source software
4	GIMP / Irfan View Image editor or equivalent	Open source software
5	LINUX OS	Open source software
6	WYSIWYG Web Authoring tool- Dreamweaver or Opensource tools likeKompozer, FrontPageor similar tools along with FTP tools for ex.Filezillaetc.	Proprietary /Open source software
7.	Tally ERP 9 or Latest	11 Licenses
8.	E Commerce Simulation Software	Open source software
9.	Web Server : Any HTTP Web server / XAMPP or any other similar server	Open source software

C. LIST OF OTHER ITEMS/ FURNITURE		
1	Hand Held 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 / 20 Nos
5	Computer table laminated 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)	20 Nos
7	Printer table 650X500X750mm can be varied as per local specifications	03Nos
8	Split type Air conditioners 1.5 tons	03Nos
9	Storage cabinet 60X700X450mm	01Nos
10	White Board.	01 No.
11	Steel Almirah	01 No.

Raw materials for a batch of 20 trainees for two semesters		
1	White Board Marker	As required
2	Duster Cloth(2' by 2')	As required
3	Cleaning Liquid 500 ml	As required
4	Xerox Paper (A4)	As required
5	Full Scape Paper (White)	2 reams
6	Cartridges for printer	As required
7	RJ 45 Jack	200 Pcs
8	Optical Mouse (USB/PS2)	As required

9	Key Board (USB/PS2)	As required
10	SMPS	As required
11	CMOS Batteries	As required
12	3 Pin Power Chord	As required
13	Cat 5/5e cable	100 meter
14	Stapler Small	2 pcs
15	Stapler Big	1 pcs
16	AAA battery for remote	As required
17	AA battery for clock	As required
18	8 GB pen drives	2 Nos
19	CDs	50 Nos
20	DVDs	50 Nos.
21	Wall Clock	1 pcs

Provision must be made for domain name registration and renewal from time to time for hosting the web sites created by the trainees as part of the syllabus.
