



कौशल बलम्

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><b>Computer components and Windows Operating System</b></p> <ul style="list-style-type: none"> <li>• Disassembling, Identification of components and Reassembling a Desktop computer.</li> <li>• Familiarization with Windows O.S desktop, using icons, buttons and customizing the desktop.</li> <li>• Managing files and folders, using removable drives.</li> <li>• Viewing system properties and control panel details. Viewing and setting environmental variables.</li> <li>• Working with MS Paint.</li> </ul>	<p><b>Introduction to Computers and Windows Operating System</b></p> <ul style="list-style-type: none"> <li>• History, Generations, Types, Advantages and Applications of Computers.</li> <li>• Concepts of Hardware and Software. Computer Hardware basics.</li> <li>• Introduction to various processors.</li> <li>• Introduction to the functions of an Operating System, Popular Operating Systems in Use.</li> <li>• Main features of Windows O.S</li> <li>• Various Input/ Output devices in use and their features.</li> <li>• Using Scanner, Printer and Webcam.</li> </ul>
3	<p><b>Computer Hardware basics and Software Installation</b></p> <ul style="list-style-type: none"> <li>• Viewing the BIOS and changing the Boot order.</li> <li>• Identify and rectify common hardware and software issues.</li> <li>• Formatting the hard disk and loading O.S and necessary application software.</li> <li>• Installation of DVD, using different types of hard disks.</li> <li>• Bluetooth Configuration, DVD write techniques.</li> </ul>	<p><b>Computer Hardware basics and Software Installation</b></p> <ul style="list-style-type: none"> <li>• Introduction to the booting process, BIOS settings and their modification.</li> <li>• Introduction to various types of memories and their features.</li> <li>• Basic Hardware and software issues and their solutions.</li> <li>• Formatting and Loading O.S and Application software and Antivirus.</li> </ul>

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

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

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

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



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

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

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

		<p>vulnerability and Risk management</p> <ul style="list-style-type: none"> <li>• Introduction to Directory Services, Access Control, Software Development Security, Privacy protection, Audit and Security.</li> <li>• Introduction to I.T Act and penalties for cybercrimes.</li> </ul>
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**

<b>SL.No</b>	<b>Name of the items</b>	<b>Quantity</b>
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 <sup>th</sup> 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>B. Software per Unit</b>		
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

<b>C. LIST OF OTHER ITEMS/ FURNITURE</b>		
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.

<b>Raw materials for a batch of 20 trainees for two semesters</b>		
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.

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