

## 7. TRADE SYLLABUS

SYLLABUS FOR COMPUTER OPERATOR AND PROGRAMMING ASSISTANT			
DURATION: ONE YEAR			
Duration	Reference Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
Professional Skill - 94 Hrs;  Professional Knowledge - 32 Hrs	Install and setup operating system and related software in a computer following safety precautions.  (Mapped NOS: SSC/N3022)	<b>Safe working practices (10 Hrs)</b> <ol style="list-style-type: none"> <li>1. Visit COPA Lab. of the institutes and locate the electrical connections with computer system setup. (3 Hrs)</li> <li>2. Identifying safety symbols and hazard identification. (3 Hrs)</li> <li>3. Practice safe methods of fire fighting in case of electrical fire. (2 Hrs)</li> <li>4. Use of fire extinguishers. (2Hrs)</li> </ol> <b>Assemble a Desktop PC (8 hrs)</b> <ol style="list-style-type: none"> <li>5. Identify computer peripherals and internal components of a desktop computer. (4 Hrs)</li> <li>6. Assemble components of desktop computer. (4 Hrs)</li> </ol> <b>Using Windows Operating Systems (20 hrs)</b> <ol style="list-style-type: none"> <li>7. Practice on Windows interface and navigating windows. (3 Hrs)</li> <li>8. Practice on managing files and folders using removable drives. (4 Hrs)</li> <li>9. Customize the desktop (2 hrs)</li> <li>10. Settings and manage user accounts. (1 Hr)</li> <li>11. View system properties and control panel details. (3 Hrs)</li> <li>12. Work with keyboard shortcut commands. (4 Hrs)</li> <li>13. Print and scan document using different commands. (3 Hrs)</li> </ol> <b>Computer basics and Software Installation (20 Hrs)</b>	<b>Introduction to Computers (3 Hrs)</b> <ul style="list-style-type: none"> <li>• Safe working practices</li> <li>• Scope of the COPA trade.</li> <li>• Safety rules and safety signs.</li> <li>• Types and working of fire extinguishers.</li> </ul> <b>Introduction to Computer components</b> <b>Introduction to computer system (4 Hrs)</b> <ul style="list-style-type: none"> <li>• Concepts of Hardware and Software.</li> <li>• Function of motherboard components and various processors.</li> <li>• Various Input/Output devices in use and their features</li> </ul> <b>Introduction Windows Operating System (9 Hrs)</b> <ul style="list-style-type: none"> <li>• Introduction to operating System</li> <li>• Main features of Windows OS</li> </ul>



		<p>14. View the BIOS settings and their modifications. (3 Hrs)</p> <p>15. Install Windows operating system. (4 Hrs)</p> <p>16. Format hard disk and create partition. (3 Hrs)</p> <p>17. Identify and rectify common hardware and software issues during OS installation. (3 Hrs)</p> <p>18. Install necessary application software for Windows i.e. Office Package, PDF Reader, Media Player etc. (2 Hrs)</p> <p>19. Configure Bluetooth and Wi-Fi settings. (1 Hr)</p> <p>20. Install Drivers for printer, scanner, webcam and DVD etc. (2 Hrs)</p> <p>21. Burn data, video and audio files on CD/DVD using application software. (2 Hrs)</p> <p><b>DOS Command Line Interface (9Hrs)</b></p> <p>22. Use basic DOS commands for directory listing. (5 Hrs)</p> <p>23. Manage files and folders using DOS commands. (4 Hrs)</p> <p><b>Install Ubuntu Linux operating system and execute basic Linux commands (27 Hrs)</b></p> <p>24. Installation of Ubuntu Linux operating system (6 Hrs)</p> <p>25. Install necessary application software for Linux i.e. Office Package, PDF Reader, Media Player etc. (4 Hrs)</p> <p>26. Use Basic Linux commands for directory listing, file and folder management, password etc. (6 Hrs)</p> <p>27. Use the Linux graphical user interface for file and folder management, exploring the system etc. (6 Hrs)</p> <p>28. Customize desktop settings and manage user accounts in Linux. (3 Hrs)</p>	<ul style="list-style-type: none"> <li>• Concept of various shortcut commands.</li> </ul> <p><b>Introduction to the booting process (6 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Introduction to various types of memories and their features.</li> <li>• Basic Hardware and software issues and their solutions.</li> <li>• Usage of Application software and Antivirus.</li> </ul> <p><b>Introduction to DOS Command Line Interface &amp; Linux Operating Systems (10 Hrs)</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>• Basic Linux commands.</li> </ul>
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		29. View system properties and manage system setting in Linux. (2 Hrs)	
Professional Skill – 47 Hrs.;  Professional Knowledge - 14 Hrs	Create, format, and edit document using word processing application software. (Mapped NOS: SSC/N3022)	<p><b>Using Word Processing Software (47 hrs)</b></p> <p><b>Manage documents (11 Hrs.)</b></p> <p><b>30. Navigate within documents (2 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Search for text</li> <li>• Link to locations within documents</li> <li>• Move to specific locations and objects in documents</li> <li>• Show and hide formatting symbols and hidden text</li> </ul> <p><b>31. Format documents (4.6 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Set up document pages</li> <li>• Apply style sets</li> <li>• Insert and modify headers and footers</li> <li>• Configure page background elements</li> </ul> <p><b>32. Save and share documents (2 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Save documents in alternative file formats</li> <li>• Modify basic document properties</li> <li>• Modify print settings</li> <li>• Share documents electronically</li> </ul> <p><b>33. Inspect documents for issues (2.4 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Locate and remove hidden properties and personal information</li> <li>• Locate and correct accessibility issues</li> <li>• Locate and correct compatibility issues</li> </ul> <p><b>Format documents (8 Hrs.)</b></p> <p><b>34. Insert text and paragraphs (2 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Find and replace text</li> </ul>	<p><b>Using Word Processing Software (14 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Introduction to the various applications in MS 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 objects, macro, mail merge, templates and other tools in Word.</li> </ul>



		<ul style="list-style-type: none"><li>• Insert symbols and special characters</li></ul> <p><b>35. Format text and paragraphs (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Apply text effects</li><li>• Apply formatting by using Format Painter</li><li>• Set line and paragraph spacing and indentation</li><li>• Apply built-in styles to text</li><li>• Clear formatting</li></ul> <p><b>36. Create and configure document sections (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Format text in multiple columns</li><li>• Insert page, section, and column breaks</li><li>• Change page setup options for a section</li></ul> <p><b>Manage tables and lists (9.5 Hrs)</b></p> <p><b>37. Create tables (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Convert text to tables</li><li>• Convert tables to text</li><li>• Create tables by specifying rows and columns</li></ul> <p><b>38. Modify tables (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Sort table data</li><li>• Configure cell margins and spacing</li><li>• Merge and split cells</li><li>• Resize tables, rows, and columns</li><li>• Split tables</li><li>• Configure a repeating row header</li></ul> <p><b>39. Create and modify lists (3.5 Hrs)</b></p> <ul style="list-style-type: none"><li>• Format paragraphs as numbered and bulleted lists</li><li>• Change bullet characters and number formats</li><li>• Define custom bullet characters and number formats</li><li>• Increase and decrease list levels</li></ul>	
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		<ul style="list-style-type: none"><li>• Restart and continue list numbering</li><li>• Set starting number values</li></ul> <p><b>Create and manage references (3 Hrs.)</b></p> <p><b>40. Create and manage reference elements (1.4 Hrs)</b></p> <ul style="list-style-type: none"><li>• Insert footnotes and endnotes</li><li>• Modify footnote and endnote properties</li><li>• Create and modify bibliography citation sources</li><li>• Insert citations for bibliographies</li></ul> <p><b>41. Create and manage reference tables (1.6 Hrs)</b></p> <ul style="list-style-type: none"><li>• Insert tables of contents</li><li>• Customize tables of contents</li><li>• Insert bibliographies</li></ul> <p><b>Manage graphic elements (8.5 Hrs.)</b></p> <p><b>42. Insert illustrations and text boxes (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Insert shapes</li><li>• Insert pictures</li><li>• Insert 3D models</li><li>• Insert Smart Art graphics</li><li>• Insert screenshots and screen clippings</li><li>• Insert text boxes</li></ul> <p><b>43. Format illustrations and text boxes (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Apply artistic effects</li><li>• Apply picture effects and picture styles</li><li>• Remove picture backgrounds</li><li>• Format graphic elements</li><li>• Format SmartArt graphics</li><li>• Format 3D models</li></ul> <p><b>44. Add text to graphic elements (1 Hr)</b></p> <ul style="list-style-type: none"><li>• Add and modify text in text boxes</li><li>• Add and modify text in shapes</li></ul>	
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		<ul style="list-style-type: none"> <li>• Add and modify SmartArt graphic content</li> </ul> <b>45. Modify graphic elements (1.5 Hrs)</b> <ul style="list-style-type: none"> <li>• Position objects</li> <li>• Wrap text around objects</li> <li>• Add alternative text to objects for accessibility</li> </ul> <b>Manage document collaboration (3.5 Hrs.)</b> <b>46. Add and manage comments (1 Hrs)</b> <ul style="list-style-type: none"> <li>• Add comments</li> <li>• Review and reply to comments</li> <li>• Resolve comments</li> <li>• Delete comments</li> </ul> <b>47. Manage change tracking (2.5 Hrs)</b> <ul style="list-style-type: none"> <li>• Track changes</li> <li>• Review tracked changes</li> <li>• Accept and reject tracked changes</li> <li>• Lock and unlock change tracking</li> </ul> <b>Manage Mailings (3.5 Hrs)</b> <b>48. Perform mail merge (3.5 Hrs)</b> <ul style="list-style-type: none"> <li>• Create envelopes</li> <li>• Create labels</li> <li>• Create a new mailing list</li> <li>• Perform mail merge using an existing list</li> </ul>	
Professional Skill - 72 Hrs.;  Professional Knowledge - 18 Hrs	Create, format, edit and develop a workbook by using spreadsheet application software.  (Mapped NOS: SSC/N3022)	<b>Spread Sheet Application (72 Hrs)</b> <b>Manage Worksheets and Workbooks (12 Hrs.)</b> <b>49. Open files in MS Excel (1.5 Hrs)</b> <ul style="list-style-type: none"> <li>• Open MS Excel</li> <li>• Create a new Excel file</li> <li>• Create a new Excel file from a template</li> <li>• Open an existing Excel file</li> </ul> <b>50. Import data (1.5 Hrs)</b> <ul style="list-style-type: none"> <li>• Import data from txt files</li> <li>• Import data from csv files</li> </ul>	<b>Spread Sheet Application (18 Hrs)</b> <ul style="list-style-type: none"> <li>• Introduction to Excel features and Data Types.</li> <li>• Cell referencing and linking Sheets.</li> <li>• Introduction to various functions in all categories of Excel.</li> </ul>



		<p><b>51. Navigate within workbooks (2 Hrs)</b></p> <ul style="list-style-type: none"><li>• Search data</li><li>• Navigate to named cells, ranges or workbook elements</li><li>• Insert and remove hyperlinks</li></ul> <p><b>52. Format worksheets and workbooks (2 Hrs)</b></p> <ul style="list-style-type: none"><li>• Modify page setup</li><li>• Adjust row height and column width</li><li>• Customize headers and footers</li></ul> <p><b>53. Customize options and views (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Display and modify content in different views</li><li>• Freeze rows and columns</li><li>• Change window views</li><li>• Modify basic workbook properties</li><li>• Display formulas</li></ul> <p><b>54. Configure content for collaboration (2 Hrs)</b></p> <ul style="list-style-type: none"><li>• Set a print area</li><li>• Save workbooks in alternative file formats</li><li>• Configure print settings</li></ul> <p><b>Manage data cells and ranges (12 Hrs.)</b></p> <p><b>55. Manipulate data (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Paste data by using special paste options</li><li>• Fill cells by using Auto Fill</li><li>• Insert and delete multiple columns or rows</li><li>• Insert and delete cells</li></ul> <p><b>56. Format cells and ranges (5 Hrs)</b></p> <ul style="list-style-type: none"><li>• Merge and Unmerge cells</li><li>• Modify cell alignment, orientation and indentation</li><li>• Format cells using Format Painter</li><li>• Wrap text within cells</li><li>• Apply number formats</li></ul>	<ul style="list-style-type: none"><li>• Concepts of sorting, filtering and validating data.</li><li>• Analyzing data using charts, data tables, pivot tables, goal seek and scenarios</li></ul>
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		<ul style="list-style-type: none"><li>• Apply cell formats from the Format cells dialog box</li><li>• Apply cell styles</li><li>• Clear cell formatting</li></ul> <p><b>57. Define and reference named ranges (4 Hrs)</b></p> <ul style="list-style-type: none"><li>• Define a named range</li><li>• Name a table</li><li>• Summarize data visually Insert spark lines</li><li>• Apply built in conditional formatting</li><li>• Remove conditional formatting</li></ul> <p><b>Manage tables and table data (12 Hrs.)</b></p> <p><b>58. Create and format tables (4 hrs)</b></p> <ul style="list-style-type: none"><li>• Create excel tables from cell ranges</li><li>• Apply table styles</li><li>• Convert tables to cell ranges</li></ul> <p><b>59. Manage tables and table data (5 Hrs)</b></p> <ul style="list-style-type: none"><li>• Add or remove table rows and columns</li><li>• Configure table style options</li><li>• Insert and configure total rows</li></ul> <p><b>60. Filter and sort table data (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Filter records</li><li>• Sort data by multiple columns</li></ul> <p><b>Perform operations using formulas and functions (12 Hrs.)</b></p> <p><b>61. Insert references (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Insert relative, absolute and mixed references</li><li>• Reference named ranges and named tables in formulas</li></ul> <p><b>62. Calculate and transform data (5 Hrs)</b></p> <ul style="list-style-type: none"><li>• Perform calculations using AVERAGE(), MIN(), MAX() and SUM()</li></ul>	
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		<ul style="list-style-type: none"> <li>Count cells by using COUNT(), COUNTIF() and COUNTBLANK()</li> <li>Perform conditional operations by using the IF() function</li> </ul> <p><b>63. Format and modify text(4 Hrs)</b></p> <ul style="list-style-type: none"> <li>Format text using RIGHT(),LEFT() and MID() functions</li> <li>Format text using UPPER(), LOWER() and LEN() functions</li> <li>Format text using CONCAT() and TEXTJOIN() functions</li> </ul> <p><b>Manage Charts (12 Hrs.)</b></p> <p><b>64. Create Charts (3 Hrs)</b></p> <ul style="list-style-type: none"> <li>Create charts</li> <li>Create chart sheets</li> </ul> <p><b>65. Modify charts (4 Hrs)</b></p> <ul style="list-style-type: none"> <li>Add data series to charts</li> <li>Switch between rows and columns in source data</li> <li>Add and modify chart elements</li> <li>Add trend lines to chart</li> </ul> <p><b>66. Format charts (5 Hrs)</b></p> <ul style="list-style-type: none"> <li>Apply chart layouts</li> <li>Apply chart styles</li> <li>Add alternative text to charts for accessibility</li> </ul> <p><b>Manage Pivot Tables (12 Hrs.)</b></p> <p><b>67. Create Pivot Tables(12 Hrs)</b></p> <ul style="list-style-type: none"> <li>Create Pivot tables from cell ranges</li> <li>Manipulate fields (columns) to get desired analysis</li> <li>Use Filters for pivot tables</li> <li>Represent data as Count, Sum, Average &amp; % of row / column</li> <li>Group data in Columns &amp; rows for aggregate reports</li> </ul>	
Professional Skill - 53 Hrs;	Create and customize slides for presentation.	<p><b>Power point Presentations (9.5 Hrs.)</b></p> <p><b>68. Open files in MS PowerPoint (1 Hr)</b></p>	<p><b>Power point Presentations (13 Hrs.)</b></p>



Professional Knowledge - 13 Hrs	(Mapped NOS: SSC/N3022)	<ul style="list-style-type: none"> <li>• Open MS PowerPoint</li> <li>• Create a new PowerPoint file</li> <li>• Create a new PowerPoint file from a template</li> <li>• Open an existing PowerPoint file</li> </ul> <p><b>69. Format PowerPoint Presentations (1.5 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Add slides</li> <li>• Add titles and text</li> <li>• Select slide layouts</li> <li>• Add PowerPoint templates</li> <li>• Duplicate slides</li> </ul> <p><b>70. Modify slide masters, handout masters, and note masters (2 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Change the slide master theme or background</li> <li>• Modify slide master content</li> <li>• Modify slide layouts</li> </ul> <p><b>71. Change presentation options and views (1.5 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Change slide size</li> <li>• Display presentations in different views</li> </ul> <p><b>72. Save and share PowerPoint Presentations (1.5 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Save presentations in alternative file formats</li> <li>• Configure different Print settings</li> <li>• Share presentations electronically</li> </ul> <p><b>73. Configure and present slide shows (1 Hr)</b></p> <ul style="list-style-type: none"> <li>• Hide unwanted slides while presenting</li> <li>• Configure slide show options</li> <li>• Present slide shows by using Presenter View</li> </ul> <p><b>74. Prepare presentations for collaboration (1 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Protect presentations by using passwords</li> </ul>	<ul style="list-style-type: none"> <li>• Image editing, Presentations</li> <li>• Introduction to Open Office.</li> <li>• Introduction to the properties and editing of images.</li> <li>• Introduction to different formats of images and their uses.</li> <li>• Introduction to Power Point and its advantages.</li> <li>• Creating Slide Shows.</li> </ul> <p>Fine tuning the presentation and good presentation technique</p>
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		<ul style="list-style-type: none"><li>• Export presentations to other formats</li></ul> <p><b>Format presentations (6.5 Hrs.)</b></p> <p><b>75. Insert text and paragraphs (2 Hrs)</b></p> <ul style="list-style-type: none"><li>• Find and replace text</li><li>• Insert symbols and special characters</li></ul> <p><b>76. Format text and paragraphs (2 Hrs)</b></p> <ul style="list-style-type: none"><li>• Apply text effects</li><li>• Apply formatting by using Format Painter</li><li>• Set line and paragraph spacing and indentation</li><li>• Apply built-in styles to text</li></ul> <p><b>77. Create and configure sections (2.5 Hrs)</b></p> <ul style="list-style-type: none"><li>• Format text in multiple columns</li><li>• Text and image presentation styles</li><li>• Clear formatting</li></ul> <p><b>Manage tables and bulleted text (8 Hrs)</b></p> <p><b>78. Create tables (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Insert tables in PowerPoint</li><li>• Apply built-in table styles</li><li>• Create tables by specifying rows and columns</li></ul> <p><b>79. Modify tables (3 Hrs)</b></p> <ul style="list-style-type: none"><li>• Insert and delete table rows and columns</li><li>• Configure cell margins and spacing</li><li>• Merge and split cells</li><li>• Resize tables, rows, and columns</li></ul> <p><b>80. Create and modify bulleted text (2 Hrs)</b></p> <ul style="list-style-type: none"><li>• Format paragraphs as numbered and bulleted lists</li><li>• Change bullet characters and number formats</li></ul>	
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		<ul style="list-style-type: none"><li>• Increase and decrease list indents</li><li>• Set starting number values</li><li>• Restart and continue list numbering on different slides</li></ul> <p><b>Create and manage reference elements (hyperlinks) (1.25 Hrs)</b></p> <ul style="list-style-type: none"><li>• Create hyperlinks within presentations</li><li>• Create hyperlinks in presentations for files and other sources</li></ul> <p><b>Manage graphic elements (11.5 Hrs)</b></p> <p><b>81. Insert illustrations and text boxes (3.5 Hrs)</b></p> <ul style="list-style-type: none"><li>• Insert shapes</li><li>• Insert pictures</li><li>• Insert SmartArt graphics</li><li>• Insert screenshots and screen clippings</li></ul> <p><b>82. Format illustrations and text boxes (4 Hrs)</b></p> <ul style="list-style-type: none"><li>• Apply artistic effects</li><li>• Apply picture effects and picture styles</li><li>• Remove picture backgrounds</li><li>• Crop images</li><li>• Format graphic elements</li><li>• Format SmartArt graphics</li></ul> <p><b>83. Add and modify text in graphic elements (4 Hrs)</b></p> <ul style="list-style-type: none"><li>• Add and modify text in text boxes</li><li>• Add and modify text in shapes</li><li>• Add and modify SmartArt graphic text</li><li>• Create, insert and modify charts</li></ul> <p><b>Manage Audio &amp; Video elements (6.5 Hrs)</b></p> <p><b>84. Add Audio elements (2 Hrs)</b></p> <ul style="list-style-type: none"><li>• Import audio files in presentations</li><li>• Configure audio playback options</li></ul>	
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		<p><b>85. Add Video elements (4.5 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Import video files in presentations</li> <li>• Resize video to fit slide</li> <li>• Configure video playback options</li> </ul> <p><b>Manage transitions and animations (9 Hrs)</b></p> <p><b>86. Add slide transitions (5 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Add same slide transition for all slides</li> <li>• Set transition effect duration</li> <li>• Configure transition start and finish options</li> <li>• Customise select slide transitions</li> </ul> <p><b>87. Add animations (4 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Animate text and graphic elements</li> <li>• Order shapes, images, and text boxes</li> <li>• Group shapes, images, and text boxes</li> <li>• Configure animation effects</li> <li>• Configure animation paths</li> <li>• Reorder animations on a slide</li> </ul> <p><b>Manage collaboration (0.75 Hrs)</b></p> <p><b>88. Add and manage comments (0.75 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Add comments</li> <li>• Review and reply to comments</li> </ul>	
Professional Skill - 53 Hrs.;  Professional Knowledge - 13 Hrs	Create and manage database file by using MySQL. (NOS: SSC/N9401)	<p><b>Demonstrate on (15 Hrs.)</b></p> <p>89. Installation of MySQL. (1 Hr)</p> <p>90. Troubleshooting basic installation issues. (1 Hr)</p> <p>91. Creation and use of database. (3 Hr)</p> <p>92. Designing of tables. (3 Hr)</p> <p>93. Applying data integrity rules. (2 Hr)</p> <p>94. Using the DDL, DCL and DML statements. (2 Hrs)</p>	<p><b>Database Concepts (4 Hrs.)</b></p> <ul style="list-style-type: none"> <li>• Concept of DBMS, RDBMS.</li> <li>• Data Models, Concept of DBA, Database Users.</li> <li>• Database Schema.</li> <li>• Designing Database using Normalization Rules.</li> <li>• Various data types Data integrity, DDL DML and DCL statements.</li> <li>• Enforcing Primary key and foreign key.</li> </ul>

		<p>95. Enforcing constraints, primary key and foreign key. (2 Hrs)</p> <p>96. Adding indices to Tables. (1 Hr)</p> <p><b>Demonstrate on (15 Hrs)</b></p> <p>97. Simple select queries. (5 Hrs)</p> <p>98. Insert and delete queries Update queries. (10 Hrs)</p> <p><b>Demonstrate on (23 Hrs)</b></p> <p>99. Using the Number, Date and Character functions. Joins and Functions (11.5 Hrs)</p> <p>100. Joins, Group by, Having, Sub query. (11.5 Hrs)</p>	<p>• Adding Indices.</p> <p><b>Queries (4 Hrs)</b></p> <p>• Concepts of Transactions • ACID Property of Transaction Constraints.</p> <p><b>Joins and Functions (5 Hrs)</b></p> <p>• Joining of tables • Sub Queries • Functions used in query like sum, average, max, min, count etc.</p>
<p>Professional Skill - 68 Hrs;</p> <p>Professional Knowledge - 16 Hrs</p>	<p>Install, setup/ configure, troubleshoot, and secure computer network including Internet. (Mapped NOS: SSC/N3022)</p>	<p><b>Computer Network (68 Hrs.)</b> <b>Set-up &amp; configure a Computer Network (48 Hrs.)</b></p> <p>101. View Network connections. (2 Hrs)</p> <p>102. Connect a computer to a network and share Devices i.e. Printers, files, folders and drives. (4 Hrs)</p> <p>103. Work with various Network devices, connectors and cables. Create straight and cross cable and punch a UTP cable in the patch socket and test the connectivity. (4 Hrs)</p> <p>104. Practice IP Addressing and Subnet masking for IPV4/ IPV6 and pinging to test networks. (4 Hrs)</p> <p>105. Configure Hub and Switch. (4 Hrs)</p> <p>106. Set up and configure wired and wireless LAN in a Computer Lab within at least three computers. (6 Hrs)</p>	<p><b>Communicating in a Connected World (12 Hrs.)</b></p> <p>• Local Networks, • Communicating on a Local Network, Principles of Communications, • How do Ethernet Networks Work?, • How are Networks Built?, • Routing Across Networks • Explain how end-user devices and local networks interact with the global Internet. • Communicating in a Connected World Explain the concept of network communication.</p>

		<p>107. Use patch panel &amp; I/O Box for wired LAN and installing &amp; configuring Internet connection in a single PC and in a LAN. (6 Hrs)</p> <p>108. Set up a proxy server/ DHCP Server with firewall. (8 Hrs)</p> <p>109. Set up video conferencing using open-source software. (4 Hrs)</p> <p>110. Use various tools (by open source /free) for network troubleshooting, maintenance and security for both Wired and Wireless (6 Hrs)</p> <p>111. <b>Set up Internet access &amp; communication (10 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Set-up internet connectivity</li> <li>• Set-up digital communication</li> </ul> <p>112. <b>Use the Internet (10 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Browse the Internet</li> <li>• Use e-mail</li> <li>• Use Social Media</li> <li>• Use the phone for online activities</li> </ul>	<ul style="list-style-type: none"> <li>• Local Networks Explain the roles of devices in a network.</li> <li>• What Does a Home Network Look Like?</li> <li>• How Does Wi-Fi Work?</li> <li>• Introduction to LAN Devices, Internetworking Devices,</li> </ul> <p><b>Internet Concepts (4 Hrs)</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 tools and Social Networking concepts.</li> </ul>
Professional Skill - 67 Hrs;  Professional Knowledge - 17 Hrs	Develop web pages using HTML and CSS. (Mapped NOS: SSC/N0503, SSC/N0501)	<p><b>Create simple static web pages using HTML tags (67 Hrs.)</b></p> <p>113. <b>Practice HTML (46 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Practice with basic HTML elements (e.g. head, title, body), tag and attributes.</li> <li>• Design simple web page with text, paragraph and line break using HTML tags</li> <li>• Format text, change background colour and insert pictures in web page</li> <li>• Design simple web page with tables and lists.</li> </ul>	<p><b>Web Design Concepts (17 Hrs)</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>• Concepts of different controls used in Web Pages.</li> <li>• Concepts of CSS and applying CSS to HTML.</li> <li>• Introduction to open source CMS</li> </ul>

		<ul style="list-style-type: none"> <li>• Use marquees, hyperlinks and mail to link in designing web pages</li> <li>• Create frames, add style and design layout.</li> <li>• Display a web page within a web page using iframes.</li> <li>• Insert text, check and combo box in web page.</li> <li>• Design web page using password field, submit button</li> <li>• Reset button and radio button etc.</li> <li>• Design a web page adding flash file, audio and video files.</li> <li>• Design web page with forms and form controls using HTML tags</li> </ul> <p><b>114. Create simple static web pages using CSS (21 Hrs )</b></p> <ul style="list-style-type: none"> <li>• CSS syntax, Adding colors, fonts, backgrounds, images borders, text alignment, text transformation, Lists etc.</li> <li>• 3 types of CSS</li> <li>• Adding a Navigation Bars(vertical/horizontal bars)</li> <li>• CSS drop downs &amp; Forms</li> <li>• CSS counters and website layout, Multiple backgrounds &amp; Putting the stylesheet in a separate file</li> <li>• CSS Animations &amp; CSS Buttons</li> </ul>	<p>viz, Joomla, Word press etc. and Web authoring tools viz. Kompozer, WordPress, Front Page etc.</p>
Professional Skill - 173 Hrs;  Professional Knowledge - 35 Hrs	Develop web pages using JavaScript.  (Mapped NOS: SSC/N0503, SSC/N0501)	<p><b>JavaScript (173 Hrs)</b></p> <p><b>Embed JavaScript in HTML Pages (127 Hrs)</b></p> <p>115. Practicing the JavaScript in creating dynamic HTML pages. (53 Hrs)</p> <p>116. Embed JavaScript in HTML to Display Information in Web pages. (31 Hrs)</p>	<p><b>Introduction to JavaScript (35 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Introduction to Programming and Scripting Languages.</li> <li>• Introduction to JavaScript and its application for the web.</li> </ul>





		<p>117. Use error handling techniques in JavaScript. (11 Hrs)</p> <p>118. Use objects and classes in JavaScript. (31 Hrs)</p> <p>119. Describe Animation and Multimedia using JavaScript. (1 Hr)</p> <p><b>Create a dynamic website using an open-source tool (40 Hrs)</b></p> <p>120. Develop dynamic HTML pages using JavaScript.</p> <p><b>Deploy a simple web project (6 Hrs)</b></p> <p>121. Deploy web project using IIS.</p>	<ul style="list-style-type: none"> <li>• Introduction to Web Servers and their features.</li> <li>• JavaScript Basics – Data types, Variables, Constants and Conversion between data types.</li> <li>• Arithmetic, Comparison, Logical Operators in JavaScript. Operator precedence.</li> <li>• Program Control Statements and loops in JavaScript.</li> <li>• Arrays in JavaScript – concepts, types and usage.</li> <li>• The String data type in JavaScript. Introduction to String, Math and Date.</li> <li>• Introduction to Functions in JavaScript.</li> <li>• Built in JavaScript functions overview.</li> <li>• Concepts of Pop Up boxes in JavaScript.</li> <li>• Introduction to the Document Object Model.</li> <li>• Concepts of using Animation and multimedia files in JavaScript.</li> </ul>
Professional Skill – 73 Hrs	Create workbooks with advanced formulas, macros, charts, pivot tables	<p><b>Data Visualization or analysis using Excel – (73 Hrs)</b></p> <p><b>Create advanced formulas and macros (24 Hrs)</b></p>	<p><b>Advanced Excel Concepts - Theory- (17 Hrs)</b></p>



Professional Knowledge - 17 Hrs.	and demonstrate ability to use Power tools. (NOS: SSC/N9402)	<p>122. Create and modify simple macros (6 Hrs)</p> <p>123. Perform form controls and create simple data entry form with macros. (6 Hrs)</p> <p>124. Look up data by using functions. (6 Hrs)</p> <p>125. Use advanced date functions.(6 Hrs)</p> <p><b>Manage advanced charts and tables (21 hrs)</b></p> <p>126. Create and modify advanced charts. (10 Hrs)</p> <p>127. Create and modify PivotTables. (11 Hrs)</p> <p><b>Use Power Query and Power BI (24 Hrs)</b></p> <p>128. Create a Power Query, Power Query Function. Invoking the Power Query function and combining queries. Organize the workbook queries (12 Hrs)</p> <p>129. Use Power BI for simple data visualizations. (12 Hrs)</p> <p><b>Make a dashboard in Excel (4 Hrs)</b></p>	<ul style="list-style-type: none"> <li>• MS excel revision (row, columns, basic formatting, insert menu, Print setup, etc. ) and Look up introduction and functions</li> <li>• Types of references and cell naming</li> <li>• Excel Linkage Custom Format and Excel Protection</li> <li>• Tips and tricks</li> <li>• Pivot table and Pivot chart</li> <li>• Conditional formatting</li> <li>• Advanced Graphs</li> <li>• Power Queries</li> </ul>
Professional Skill - 25hrs;  Professional Knowledge - 10 Hrs.	Browse, select, and transact using E-commerce websites(NOS: SSC/N9403)	<p><b>Browse e-Commerce sites to identify products &amp; services (6.5 Hrs)</b></p> <p>130. Demonstrate e-Commerce sites. (1.5 Hrs)</p> <p>131. List features of e-commerce sites. (2 Hrs)</p> <p>132. Use e-commerce sites to source an item. (3 Hrs)</p> <p><b>Shop online (4.5 Hrs)</b></p> <p>133. Undertake transactions on an e-commerce site. (4.5 Hrs)</p> <p><b>Manage e-commerce operations (14 Hrs)</b></p> <p>134. Add products to an ecommerce website. (4 Hrs)</p> <p>135. Practice order processing. (3 Hrs)</p> <p>136. Practice payment processing. (4.5 Hrs)</p>	<p><b>e-Commerce (10 Hrs)</b></p> <ul style="list-style-type: none"> <li>• Introduction to E Commerce and advantages.</li> <li>• Building business on the net.</li> <li>• Payment and Order Processing, Authorization, Chargeback and other payment methods.</li> <li>• Security issues and payment gateways.</li> </ul>



		137. Identify common security issues. (3.5 Hrs )	
Professional Skill - 20 Hrs  Professional Knowledge - 10 Hrs.	Secure information from Internet by using cyber security concept. (NOS: SSC/N9404)	<b>138. Protect information, computers and networks from viruses, spyware and other malicious code (19 Hrs)</b> <ul style="list-style-type: none"> <li>• Explain Cyber security (2 Hrs)</li> <li>• Secure computers &amp; the network (5.5 Hrs)</li> <li>• Reduce cyber security threats (2 Hrs)</li> <li>• Secure a Wi-Fi Network (4 Hrs)</li> <li>• Use Anti-Virus software (3 Hrs)</li> <li>• Perform back-ups of files, data &amp; information (2.5 Hrs)</li> </ul> <b>139. Explain compliance with IT Act (1 Hr)</b> <ul style="list-style-type: none"> <li>• Identify steps for information privacy. (0.5 Hrs)</li> <li>• Identify common cybercrimes and penalties applicable. (0.5 Hrs)</li> </ul>	<b>Cyber Security (10 Hrs)</b> <ul style="list-style-type: none"> <li>• Overview of Information Security, SSL, HTTPS, Security threats, information Security vulnerability and Risk management.</li> <li>• Introduction to Directory Services, Access Control, Security, Privacy protection, Audit and Security.</li> <li>• Introduction to IT Act and penalties for cybercrimes.</li> </ul>
Professional Skill –25 Hrs;  Professional Knowledge 15 Hrs.	Explain Cloud concepts & services and Describe Application Development Life Cycle. (NOS: SSC/N9405)	<b>Cloud Computing (15 Hrs)</b> <b>Working with Cloud Services (12 Hrs)</b> <ul style="list-style-type: none"> <li>140. Practice with IaaS using free cloud services. (4 Hrs)</li> <li>141. Practice with PaaS using free cloud services. (4 Hrs)</li> <li>142. Practice with SaaS using free cloud services. (4 Hrs)</li> </ul> <b>Web hosting in Cloud (3 Hrs)</b> <ul style="list-style-type: none"> <li>143. Host a website in a free cloud. (3 Hrs)</li> </ul> <b>Develop an application and perform the Application Development Life Cycle (10 Hrs)</b> <ul style="list-style-type: none"> <li>144. Identify Phases of the Application Development Life Cycle. (5 Hrs)</li> <li>145. Describe Roles in each of the phases of Application</li> </ul>	<b>Introduction to Cloud Computing (12 Hrs)</b> <ul style="list-style-type: none"> <li>• Benefits of cloud services, different categories.</li> <li>• Resources available in cloud.</li> </ul> <b>Explain the Application Development Life Cycle (3 Hrs)</b> <ul style="list-style-type: none"> <li>• Identify Phases of the Application Development Life Cycle.</li> <li>• Describe Roles in each of phases of the Application Development Life Cycle.</li> </ul>

		Development Life Cycle. (5 Hrs)	
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**To be selected either “Programming in Python” or “Programming in Java” as Elective Module for COPA.**

<b>COPA - Elective Module – I</b>		<b>Programming in Python</b>	
Professional Skill - 70 Hrs;  Professional Knowledge - 30 Hrs.	Write programs using Python language. ( NOS: SSC/N9406)	<b>Programming language (Python)</b> <b>Use Python from command line (7 Hrs)</b> <ol style="list-style-type: none"> <li>1. Install, set up the environment &amp; run Python. (3 Hrs)</li> <li>2. Use Command Line and IDE to create and execute a python program. (4 Hrs)</li> </ol> <b>Perform Operations using Data Types and Operators (15 Hrs)</b> <ol style="list-style-type: none"> <li>3. Write and test a python program to demonstrate print statement, comments, different types of variables. (5 Hrs)</li> <li>4. Write and test a python program to perform data and data type operations, string operations, date, input and output, output formatting and operators. (5 Hrs)</li> <li>5. Determine the sequence of execution based on operator precedence. (5 Hrs)</li> </ol> <b>Control Flow with Decisions and Loops (20hrs)</b> <ol style="list-style-type: none"> <li>6. Construct and analyze code segments that use branching statements. (10 Hrs)</li> <li>7. Construct and analyze code segments that perform iteration. (10 Hrs)</li> </ol> <b>Document and Structure Code (18 Hrs)</b>	<b>Programming language (Python) (30 Hrs)</b> <ul style="list-style-type: none"> <li>• Introduction to Python History</li> <li>• Features, Setting up path Basic Syntax, Comments, Variable</li> <li>• Different Data Types</li> <li>• Casting, string, Boolean</li> <li>• Python Operators</li> <li>• Conditional Statements</li> <li>• Looping</li> <li>• Control Statements, String Manipulation, Lists, Tuple, sets</li> <li>• Dictionaries</li> <li>• Arrays</li> <li>• Iterators, modules, dates, math,</li> <li>• Modules, Input and Output.</li> </ul>



		<ol style="list-style-type: none"> <li>8. Document code segments using comments and documentation strings. (3 Hrs)</li> <li>9. Construct and analyze code segments that include List comprehensions, tuple, set and Dictionary comprehensions. (16 Hrs)</li> </ol> <p><b>Perform Operations Using Modules and Tools (10 Hrs)</b></p> <ol style="list-style-type: none"> <li>10. Perform basic operations using built-in modules. (5 Hrs)</li> <li>11. Solve complex computing problems by using built-in modules. (5 Hrs)</li> </ol>	
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<b>COPA - Elective Module – II</b>		<u>Programming in JAVA</u>	
Professional Skill - 70 Hrs;	Writing programs using JAVA. (SSC/N9407)	<p><b>Object Oriented Programming and JAVA Language (15 Hrs)</b></p> <ol style="list-style-type: none"> <li>1. Installing JAVA.</li> <li>2. Setting the Class path.</li> <li>3. Writing and Executing a simple JAVA Program to display “Hello”.</li> </ol> <p>Demonstrate writing JAVA programs:</p> <ol style="list-style-type: none"> <li>4. Use of various data types in JAVA.</li> <li>5. Use of various operators in JAVA.</li> <li>6. Create and use of Local, Instance and Class variables.</li> <li>7. Read text from the keyboard using scanner class read text from the keyboard using console class.</li> </ol>	<p>Explain the following:</p> <ul style="list-style-type: none"> <li>• Object Oriented Programming with Core Java</li> <li>• Java Programming features</li> <li>• JVM, Byte codes and Class path</li> <li>• Java Program Development</li> <li>• Compilation and Execution of JAVA programs</li> <li>• Basic JAVA language elements – keywords, comments, data types and variables.</li> <li>• JAVA Arithmetic, Assignment, Relational, Logical, Increment /</li> </ul>



			<p>Decrement operators and expressions.</p> <ul style="list-style-type: none"><li>• JAVA String Operators</li><li>• JAVA Input and Output streams, System in, System out.</li><li>• Input using Scanner class and Console class methods. (10Hrs.)</li></ul>
		<p><b>JAVA Program Flow Control (20 Hrs)</b></p> <p>Demonstrate writing JAVA programs:</p> <ol style="list-style-type: none"><li>8. Use of the if and if ... else statements.</li><li>9. Use of the Switch statement.</li><li>10. Use of the Do ... While and while – do loops.</li><li>11. Use of the For Loop.</li><li>12. Use of the Break and Continue Keywords.</li><li>13. Use of the JAVA Numbers Class methods.</li><li>14. Use of the JAVA Character Class methods.</li><li>15. Use of the JAVA String Class methods.</li><li>16. Create and use of arrays.</li></ol>	<p>Explain the following:</p> <ul style="list-style-type: none"><li>• Decision making and flow control using if...then, if then else, nested if, switch case and the conditional ternary operators in JAVA.</li><li>• Loop control flow using while – do, do – while loops, for loop, using the break, continue statements.</li><li>• Terminating the JAVA program. JAVA Number, Character and String Classes.</li></ul> <p>Arrays in JAVA. (6Hrs.)</p>

		<p><b>JAVA Classes, Overloading and Inheritance (20 Hrs)</b></p> <p>Demonstrate writing JAVA programs:</p> <ol style="list-style-type: none"> <li>17. Create and use of simple classes, objects and methods in JAVA.</li> <li>18. Pass data and Objects to Methods.</li> <li>19. Return data and Objects from Methods.</li> <li>20. use of constructors in JAVA.</li> <li>21. Create and use of Overloaded methods in JAVA.</li> <li>22. Override methods in JAVA.</li> <li>23. Create and use of Super class, Sub class in JAVA.</li> </ol>	<p>Explain the following:</p> <ul style="list-style-type: none"> <li>• JAVA Objects, Classes and Methods.</li> <li>• Passing data and objects as parameters to methods.</li> <li>• Method Overloading.</li> <li>• Constructors and Overloaded constructors.</li> <li>• Inheritance in JAVA.</li> <li>• Method Overriding in JAVA. (8Hrs.)</li> </ul>
		<p><b>Abstract Classes and Interfaces in JAVA (15 Hrs)</b></p> <p>Demonstrate writing JAVA programs:</p> <ol style="list-style-type: none"> <li>24. Create and use virtual methods.</li> <li>25. Create abstract classes and methods.</li> <li>26. Create interfaces in JAVA.</li> <li>27. Override methods in JAVA.</li> <li>28. Create and implement an interface.</li> <li>29. Extend interfaces in JAVA.</li> <li>30. Create and use a package in JAVA.</li> </ol>	<p>Explain the following:</p> <ul style="list-style-type: none"> <li>• Concept of Virtual methods.</li> <li>• Concept of Abstract classes and methods</li> <li>• Features of Abstract Classes</li> <li>• JAVA Interfaces and their advantages</li> <li>• Method Overriding in JAVA</li> <li>• Polymorphism in JAVA</li> <li>• Creating, implementing and extending interfaces</li> <li>• Creating and using Packages in JAVA. (6Hrs.)</li> </ul>



		<b>Troubleshooting Java issues</b> Download and Install Java, Check and Verify Java Configurations, Test Java, Remove Old Versions of Java, Find Java version, Always redirected to the java.com download page.	
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**Industrial Visit/Project work**

**Broad Area:**

- Create and host a web site of at least 6 web pages using JavaScript & CSS containing interactive objects, functions etc.
- Create a project with Excel on Payroll Systems.
- Create a database with MySQL on Library management system.
- Create project in Python/Java programming language.