



GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

DATABASE SYSTEM ASSISTANT

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4.5



SECTOR – IT & ITES



Directorate General of Training

DATABASE SYSTEM ASSISTANT

(Non-Engineering Trade)

(Revised in March 2023)

Version: 2.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL – 4.5

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

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1. COURSE INFORMATION

During the one-year duration of Database System Assistant trade a candidate is trained on professional skill, professional knowledge and Employability skill related to job role. In addition to this a candidate is entrusted to undertake project work and extra-curricular activities to build up confidence. The broad components covered under Professional Skill subject are as below: -

The trainee learns about demonstration of various parts of computer system and practice with Microsoft Word. Familiarize with Operating System and practice with all the system application. Install Operating System and all other related application software. Configure network connection and browsing Internet. Create, format, edit a worksheet using Microsoft Excel. Create customized database files using Microsoft Access. Design and develop web pages using HTML. Design and develop web pages using PHP. Install and configure MySQL; and practice on MySQL syntax for database design. At the end of this year trainees can go on industrial visit or projects specified in the syllabus.

The trainee learns to create a table and manipulate data using query language. Select data from table using 'select' query and maintain database. Practice on transaction in database using SQL programming. Implement XML data and use it in SQL server. Design an online Database System using open source software tools. Secure a Database System by applying Information Security, Security Threats, Security Vulnerabilities and Risk Management. Implement Database System backup and restoring backup. Implement Database System security by creation of roles and functions for Database Users. Configure and use Web Server, Reporting Services tools. At the end of year trainees can go on industrial visit or projects specified in the syllabus.

2. TRAINING SYSTEM

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under the aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer schemes of DGT for strengthening vocational training.

The “Database System Assistant” Trade under CTS is one of the popular courses delivered nationwide through network of ITIs. The course is of one year duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills and knowledge, while the core area (Employability Skill) imparts requisite core skills, knowledge, and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by DGT which is recognized worldwide.

Trainees need to demonstrate broadly that they are able to:

- Read and interpret technical parameters/ documentation, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations.
- Apply professional knowledge & employability skills while performing the job and modification & maintenance work.
- Check the system specification and application software as per requirement of the design of job.
- Document the technical parameter related to the task undertaken.

2.2 PROGRESSION PATHWAYS

- Can join industry as Database System Assistant and will progress further as Database System Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.
- Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.
- Can join advanced Diploma (Vocational) courses under DGT as applicable.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year: -

S No.	Course Element	Notional Training Hours
1	Professional Skill (Trade Practical)	840
2	Professional Knowledge (Trade Theory)	240
3	Employability Skills	120
	Total	1200

Every year 150 hours of mandatory OJT (On the Job Training) at nearby industry, wherever not available then group project is mandatory.

On the Job Training (OJT)/ Group Project	150
Optional Courses (10th/ 12th class certificate along with ITI certification or add on short term courses)	240

Trainees of one-year or two-year trade can also opt for optional courses of up to 240 hours in each year for 10th/ 12th class certificate along with ITI certification, or, add on short term courses

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The **Continuous Assessment** (Internal) during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute has to maintain an individual trainee portfolio as detailed in assessment guideline. The marks of internal assessment will be as per the formative assessment template provided on www.bharatskills.gov.in

b) The final assessment will be in the form of summative assessment. The All India Trade Test for awarding NTC will be conducted by **Controller of examinations, DGT** as per the guidelines. The pattern and marking structure is being notified by DGT from time to time. **The learning outcome and assessment criteria will be the basis for setting question papers for final**

assessment. The examiner during final examination will also check the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

For the purposes of determining the overall result, weightage of 100% is applied for six months and one year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising some of the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work
- Computer based multiple choice question examination
- Practical Examination

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted for formative assessment:

Performance Level	Evidence
(a) Marks in the range of 60%-75% to be allotted during assessment	

For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices	<ul style="list-style-type: none"> • Demonstration of good skills and accuracy in the field of work/ assignments. • A fairly good level of neatness and consistency to accomplish job activities. • Occasional support in completing the task/ job.
(b) Marks in the range of 75%-90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices	<ul style="list-style-type: none"> • Good skill levels and accuracy in the field of work/ assignments. • A good level of neatness and consistency to accomplish job activities. • Little support in completing the task/ job.
(c) Marks in the range of more than 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	<ul style="list-style-type: none"> • High skill levels and accuracy in the field of work/ assignments. • A high level of neatness and consistency to accomplish job activities. • Minimal or no support in completing the task/ job.

3. JOB ROLE

Database Administrator; co-ordinates physical changes to computer databases; and codes, tests, and implements physical database, applying knowledge of database management system: Designs logical and physical databases or reviews description of changes to database design to understand how changes to be made affect physical database (how data is stored in terms of physical characteristics, such as location, amount of space, and access method). Establishes physical database parameters. Codes database descriptions and specifies identifiers of database to database management system or directs others in coding database descriptions. Calculates optimum values for database parameters, such as amount of computer memory to be used by database, following manuals and using calculator. Specifies user access level for each segment of one or more data items, such as insert, replace, retrieve, or delete data. Specifies which users can access databases and what data can be accessed by user. Tests and corrects errors, and refines changes to database. Enters codes to create production database. Selects and enters codes of utility programs to monitor database performance, such as distribution of records and amount of available memory. Directs programmers and analysts to make changes to database management systems. Reviews and corrects programs. Answers user questions. Confers with co-workers to determine impact of database changes on other systems and staff cost for making changes to the database. Modifies database programs to increase processing performance, referred to as performance tuning. Workers typically specialize in one or more types of database management systems. May train users.

Junior Data Associate; is responsible for designing and implementing processes and layouts for complex, large-scale data sets used for modelling, data mining, and research purposes. Responsibilities also include designing and implementing statistical data quality procedures around new data sources.

Reference NCO-2015:

- (i) 2522.0100 - Database Administrator
- (ii) 2521.0202 - Junior Data Associate

Reference NOS: --

- (i) SSC/N3022
- (ii) SSC/N0202
- (iii) SSC/N1301
- (iv) SSC/N0101
- (v) SSC/N8115
- (vi) SSC/N8116
- (vii) SSC/N8117

4. GENERAL INFORMATION

Name of the Trade	DATABASE SYSTEM ASSISTANT
NCO - 2015	2522.0100, 2521.0202
NOS Covered	SSC/N3022, SSC/N0202, SSC/N1301, SSC/N0101, SSC/N8115, SSC/N8116, SSC/N8117
NSQF Level	Level – 4.5
Duration of Craftsmen Training	One Year (1200 Hours + 150 Hours OJT/Group Project)
Entry Qualification	Passed 12th class examination with Science and Mathematics
Minimum Age	14 years as on first day of academic session.
Eligibility for PwD	LD, CP, LC, DW, LV, AA, LV, AUTISM, SLD
Unit Strength (No. of Student)	24 (There is no separate provision of supernumerary seats)
Space Norms	70 Sq. m.
Power Norms	3.45 KW
Instructors Qualification for	
(i) Data Base System Assistant	<p>B.Voc./Degree in Engineering (Computer Science or IT) / MCA/ MSc. (Computer Science or IT) from UGC Recognized university with One year Experience in relevant field.</p> <p style="text-align: center;">OR</p> <p>Diploma (Minimum 3 years) in Computer Science or IT from recognized of education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>NTC/ NAC passed in Database System Assistant trade with Three years Experience in relevant field.</p> <p><u>Essential Qualification:</u> Relevant Regular / RPL variants of National Craft Instructor Certificate (NCIC) under DGT.</p> <p><i>Note: Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC</i></p>



	<i>qualifications. However both of them must possess NCIC in any of its variants.</i>
(ii) Employability Skill	<p>MBA/ BBA / Any Graduate/ Diploma in any discipline with Two years' experience with short term ToT Course in Employability Skills.</p> <p>(Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above)</p> <p style="text-align: center;">OR</p> <p>Existing Social Studies Instructors in ITIs with short term ToT Course in Employability Skills.</p>
(iii) Minimum age for Instructor	21 years
List of Tools & Equipment	As per Annexure-I

5. LEARNING OUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

5.1 LEARNING OUTCOMES

1. Demonstrate various parts of computer system and practice with Microsoft Word following safety precautions. (NOS: SSC/N3022)
2. Familiarize with Operating System and practice with all the system application. (NOS: SSC/N3022)
3. Install Operating System and all other related application software. (NOS: SSC/N0202)
4. Configure network connection and browsing Internet. (NOS: SSC/N0202)
5. Create, format, edit a worksheet using Microsoft Excel. (NOS: SSC/N3022)
6. Create customized database files using Microsoft Access. (NOS: SSC/N8115)
7. Design and develop web pages using HTML. (NOS: SSC/N1301)
8. Design and develop web pages using PHP. (NOS: SSC/N1301)
9. Install and configure MySQL; and practice on MySQL syntax for database design. (NOS: SSC/N0101)
10. Create a table and manipulate data using query language. (NOS: SSC/N8115)
11. Select data from table using 'select' query and maintain database. (NOS: SSC/N8116)
12. Perform transactions in database using SQL programming. (NOS: SSC/ N8116)
13. Implement XML data and use it in SQL server. (NOS: SSC/ N8116)
14. Design an online Database System using open source software tools. (NOS: SSC/N8115)
15. Secure a Database System applying Information Security, Security Threats, Security Vulnerabilities and Risk Management. (NOS: SSC/N8117)
16. Implement Database System backup and restoring backup. (NOS: SSC/N8116)
17. Implement Database System security by creation of roles and functions for Database Users. (NOS: SSC/N8117)
18. Configure and use Web Server, Reporting Services tools. (NOS: SSC/N0202)

6. ASSESSMENT CRITERIA

LEARNING OUTCOME	ASSESSMENT CRITERIA
1. Demonstrate various parts of computer system and practice with Microsoft Word following safety precautions. (NOS: SSC/N3022)	Demonstration of various parts of computer system such as mother board, RAM, CPU, serial and parallel ports.
	Open, resize and close MS WORD. Opening, edit and save/ "save as" documents.
	Add Bullets and numbering. Create Hyperlinks. Create brochures. Create book work.
2. Familiarize with Operating System and practice with all the system application. (NOS: SSC/N3022)	Using desktop, task bar, start button, title bar, menus and windows help.
	Creating, deleting and renaming of files, folders & short cuts.
	Expand compressed directories and files. Open and manage multiple director windows. View and sort files, creating and renaming files/directories, disk operation using file manager.
	Introduction Linux – Practicing of Linux commands.
3. Install Operating System and all other related application software. (NOS: SSC/N0202)	Practice on Installation of Windows 7, 8, 10, Linux.
	Installation of MS Office, Libre Office, Open source and utilities, remote control, chat, voice and video, Live CD Operations.
4. Configure network connection and browsing Internet. (NOS: SSC/N0202)	Operations browsing, downloading messages, pictures from internet, sending and receiving emails, sending attachments of pictures and text information, E-chatting.
	Testing and troubleshooting of Modem. Operating of Routers, Security Implementations, Troubleshooting of internet connection.
	Operating WiFi access points/ modems, setting up of blue tooth and data sharing with mobiles.
5. Create, format, edit a worksheet using Microsoft Excel. (NOS: SSC/N3022)	Practice Excel - creating various worksheets, mathematical calculations, using different formulae.
	Preparing various types of Graphs/ charts, different Chart options, colouring etc.
6. Create customized database files using Microsoft Access. (NOS: SSC/N8115)	Creating and designing tables, forms in MS Access.
	Data entering using forms/ tables with different fields, modifying structure, generating queries, reports.
7. Design and develop	Practice on creation of HTML tags for text, images, links, list, simple

web pages using HTML. (NOS: SSC/N1301)	layouts, complex layouts, tables, frames, style, internet style sheets.
	Creating Tables - Adding and Deleting Rows, Columns, and Cells, Background Colors.
	Practicing Hyperlinks - To 'Outside'/ External Sites, Internal Link, Bookmark, Email Addresses, Rollover Styles, Target Frames, Practice on Marquees.
	Practice on Sample Forms Page, Date and Time Stamp, Counter, Page Transitions, Changing your Password.
	Practice on creating Frames, Shared Borders.
8. Design and develop web pages using PHP. (NOS: SSC/N1301)	Installation of Apache Web Server.
	Practice on simple PHP programming to test events.
	Practicing the while and do-while statement.
	Practicing user defined functions, dynamic functions, variable scope.
	Practice on The anatomy of a cookie, setting a cookie with PHP.
	Practice on working with the query string, creating query string.
	Practice on working with directories in PHP, checking for existence of file, determining file size.
9. Install and configure MySQL; and practice on MySQL syntax for database design. (NOS: SSC/N0101)	Working with Object constructors and destructors, Class constants, Class inheritance, Abstract classes and methods, Object serialization.
	Installation of MySQL.
	Configuration of MySQL.
	Practice on MySQL syntax and creating database design.
	Importing and exporting formats.
	Practice on Database repair and archival.
10. Create a table and manipulate data using query language. (NOS: SSC/N8115)	Practicing on Creation and use of database, Data type, Creation of table.
	Practicing on simple insert query and insert query using select.
11. Select data from table using 'select' query and maintain database. (NOS: SSC/N8116)	Select specific column.
	Concatenate the text value in the output.
	Practice on where clause.
	Practice on arithmetic operation, comparisons operator, and/ or operator.
12. Perform transactions in database using SQL programming. (NOS: SSC/N8116)	Practice on Null value, order by Top value of the table, Distinct.
	Practice on Aggregate and Group by –Min, Max, Sum, Count, Group by, Compute and compute by Pivot.
	Practice on Sub queries – and exists, Nested sub queries, Correlated sub queries.

13. Implement XML data and use it in SQL server. (NOS: SSC/N8116)	Implement XML schemas and handling of XML data.
	XML data: how to handle it in SQL Server and when not to use it, including XML namespaces.
	Import and export XML.
14. Design an online Database System using open source software tools. (NOS: SSC/N8115)	Create an online database using any one of Open Tools Postgre SQL (Or) Ingres (Or) Fire Bird, (Or) Cubrid (Or) ISQL.
15. Secure a Database System applying Information Security, Security Threats, Security Vulnerabilities and Risk Management. (NOS: SSC/N8117)	Practice on Information Security.
	Practice on Security Vulnerabilities.
	Practice on Risk Management.
	Practice on Securing Database.
16. Implement Database System backup and restoring backup. (NOS: SSC/N8116)	Practice on configure and maintain back up strategy, manage different back up models.
	Practice on Restoring a database to point in time.
	Practice on Restoring in, create a restore strategy for redundant server.
17. Implement Database System security by creation of roles and functions for Database Users. (NOS: SSC/N8117)	Manage logins and server roles Configure server security; secure the SQL Server using Windows Account / SQL Server accounts, server roles; create login accounts.
	Manage database permissions Configure database security; database level, permissions; protect objects from being modified.
	Create database user accounts; contained login; Troubleshoot security; Manage certificates and keys; endpoints
18. Configure and use Web Server, Reporting Services tools. (NOS: SSC/N0202)	Web Sever configuration Manager.
	Web server management studio.
	Reporting services configuration.

SYLLABUS FOR DATABASE SYSTEM ASSISTANT TRADE			
DURATION – ONE YEAR			
Duration	Reference Learning Outcome	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
Professional Skill 20Hrs; Professional Knowledge 06Hrs	Demonstrate various parts of computer system and practice with Microsoft Word following safety precautions.	<p>Introduction to Computers</p> <ol style="list-style-type: none"> 1. Connecting of power supply to computer and its peripherals. 2. Demonstration of various parts of computer system such as mother board, RAM, CPU, serial and parallel ports. <p>Microsoft WORD</p> <ol style="list-style-type: none"> 3. Open, resize and close MS WORD. Opening, edit and save/ "save as" documents. 4. Use all menu bar features. Use all Standard tool bar features. 5. Create Document, non-documents files. Create templates. Create tables. Insert pictures and videos. 6. Mail merge documents. Creating Bookmarks. 7. Add Bullets and numbering. Create Hyperlinks. Create brochures. Create book work. 	<p>Introduction to Computers</p> <ul style="list-style-type: none"> • Basic Definition, hardware, software. • Block Diagram of Computer system. • I/O devices and its application. • Switching and shutting down the computer. • Features and functions of Operating systems, different types of operating systems. <p>Microsoft WORD</p> <ul style="list-style-type: none"> • Text editing software's. Introduction to MS Office. Features and application of Microsoft word. Concept of word processing. • Menu bar features. Standard tool bar features. Editing the text, use of different tools, formatting the text. • Creating, Document, non-documents files. Creating templates. Creating tables. Inserting pictures and videos. • Mail merge. Book marks. Bullets and numbering. Hyperlinks. Creating brochures. Creating bookwork.

Professional Skill 40Hrs; Professional Knowledge 12Hrs	Familiarize with Operating System and practice with all the system application.	MS Windows <ol style="list-style-type: none"> 8. Using desktop, task bar, start button, title bar, menus and windows help. 9. My computer & recycle bin. 10. Creating, deleting and renaming of files, folders & short cuts. 11. Opening & closing of different windows. Using different windows at a time. 12. Moving through windows and mouse, maximize/ minimize windows, use of help feature, exit windows, starting an application and closing application. 13. File management through windows explorer-select files and directories, copy, move, delete files/ directories. 14. Expand compressed directories and files. Open and manage multiple director windows. View and sort files, creating and renaming files/ directories, disk operation using file manager. 15. Using essential accessories-notepad, word pad, paint brush, calculators, calendar, character map, system tools, entertainment. 16. Using Multimedia and windows media player and sounds. 17. Using control panel. 18. Zipping and unzipping. 19. Introduction Linux – Practicing of Linux commands. 	MS Windows <ul style="list-style-type: none"> • Different versions, advantages and application of windows. Starting windows and their operations. • File Management through Windows explorer. • Introduction and applications of Accessories such as notepad, word pad, paint brush, calculators, calendar, character map, system tools, entertainment. • Multimedia and windows media player and sounds. • Application of control panel. • Zipping and unzipping. • Introduction to Linux.
Professional Skill 20Hrs; Professional Knowledge 06Hrs	Install Operating System and all other related application software.	Software Installation <ol style="list-style-type: none"> 20. Practice on Installation of Windows 7, 8, 10, Linux. 21. Installation of MS Office, Libre Office, Open source and utilities, remote control, chat, voice and video, Live CD Operations. 	<ul style="list-style-type: none"> • Different configurations of Computer system and its peripherals, Compatible with different hardware/ software. Software Installation – <ul style="list-style-type: none"> • Pre-installation - Prerequisites, Install

			<p>procedure, Rollback or Un-install procedure, Tests.</p> <ul style="list-style-type: none"> • Post-installation – Backup procedure & specifications, Restore procedure, Periodical view check. • Awareness of IT –Act 2000, its Amendments and Phenomena (T-5) <ul style="list-style-type: none"> - Provisions of act. - Types of offences, fines, imprisonment. - Cyber Crime, Cyber Law. • Awareness of legal aspects of using computers such as copyright, patent etc.
Professional Skill 30Hrs; Professional Knowledge 12Hrs	Configure network connection and browsing Internet.	Internet 22. Sharing Internet connection through LAN to other computers 23. Operating WiFi access points/modems, setting up of blue tooth and data sharing with mobiles. 24. Creating simple VPN implementation, Visit to NIC/ other Data centers.	Internet <ul style="list-style-type: none"> • Operations and applications of internet. • Setting of modem, connecting dial up connecting ISDN and Broadband connections, DTMF telephone system. • Testing and troubleshooting of Modem, Routers. • WiFi, Bluetooth and VPN Implementation. • Introduction to Routers/ Firewalls, Anti-Spam filters and VoIP. • Introduction to Data Centers and applications • Introduction to Cloud computing.
Professional Skill 30Hrs; Professional	Create, format, edit a worksheet using Microsoft Excel.	Microsoft EXCEL 25. Practice Excel - creating various worksheets, mathematical calculations, using different	Microsoft EXCEL <ul style="list-style-type: none"> • Application of spread sheet. • Advantages of MS Excel,

Knowledge 12Hrs		<p>formulae.</p> <p>26. Preparing various types of Graphs/ charts, different Chart options, colouring etc.</p> <p>27. Practice on Sorting and Filtering.</p> <p>28. Printing worksheet</p>	<ul style="list-style-type: none"> • Use of Microsoft Excel features for creating worksheets with mathematical formulae and graphs.
Professional Skill 40Hrs; Professional Knowledge 12Hrs	Create customized database files using Microsoft Access.	<p>Microsoft Access</p> <p>29. Creating and designing tables, forms in MS Access.</p> <p>30. Data entering using forms/ tables with different fields, modifying structure, generating queries, reports.</p>	<p>Microsoft Access</p> <ul style="list-style-type: none"> • Introduction to data base management systems. • Data Types. • E-R Modeling, Data Flow Diagram. • Relational Databases, transactional databases. • Database Creation, NULL's, dropping a table, DB abstracts.
Professional Skill 40Hrs; Professional Knowledge 12Hrs	Design and develop web pages using HTML.	<p>HTML</p> <p>31. Practice on creation of HTML tags for text, images, links, list, simple layouts, complex layouts, tables, frames, style, internet style sheets.</p> <p>32. Introduction to Front Page. Creating Background Pictures.</p> <p>33. Creating Tables - Adding and Deleting Rows, Columns, and Cells, Background Colors.</p> <p>34. Practicing Picture Manipulation - Transparent, Alt Representation Text Tags, Rotating, Thumbnails, Picture Gallery.</p> <p>35. Practicing Hyperlinks - To 'Outside'/ External Sites, Internal Link, Bookmark, Email Addresses, Rollover Styles, Target Frames, Practice on Marquees.</p> <p>36. Practice on Forms - Search Page, Inserting a Form, One Line Text Box, Option Button, Check Box, Text Area, Drop</p>	<p>HTML</p> <ul style="list-style-type: none"> • HTML skeleton, HTML tags for text, links, lists, HTML tags and web standards for images (graphics), Simple layouts, Complex layouts, HTML tags for layout, HTML tags for tables, HTML tags for styles. • Introduction to Front Page, Background Pictures • Tables - Adding and Deleting Rows, Columns, and Cells, Background Colors. • Picture Manipulation - Transparent, Alt Representation Text Tags, Rotating, Thumbnails, Picture Gallery. • Hyperlinks - To 'Outside'/External Sites, Internal Link, Bookmark, Email Addresses, Rollover Styles, Target Frames,

		<p>Down Box, Confirmation Pages.</p> <p>37. Practice on Sample Forms Page, Date and Time Stamp, Counter, Page Transitions, Changing your Password.</p> <p>38. Practice on - Themes, Banners, Buttons, Headings, Hyperlinks/ Bullets/ Horizontal Lines, Navigation Bars.</p> <p>39. Practice on creating Frames, Shared Borders.</p> <p>40. Practice on Scheduling a Web Page or Picture to Appear.</p>	<p>Marquees.</p> <ul style="list-style-type: none"> • Forms - Search Page, Inserting a Form, One Line Text Box, Option Button, Check Box, Text Area, Drop Down Box, Confirmation Pages. • Sample Forms Page, Date and Time Stamp, Counter, Page Transitions, Changing your Password. • Themes, Banners, Buttons, Headings, Hyperlinks/ Bullets/ Horizontal Lines, Navigation Bars • Frames, Shared Borders, Scheduling a Web Page or Picture to Appear.
<p>Professional Skill 100Hrs;</p> <p>Professional Knowledge 24Hrs</p>	<p>Design and develop web pages using PHP.</p>	<p>PHP (Hyper Text Pre Processor)</p> <p>41. Installation of Apache Web Server.</p> <p>42. Practice on simple PHP programming to test events.</p> <p>43. Practicing the IF statement. Using the else clause with if statement.</p> <p>44. Practicing the switch statement using the operator.</p> <p>45. Practicing the while and do-while statement.</p> <p>46. Practice on for statement, breaking out of loops, nesting loops.</p> <p>47. Practicing on Functions and returning value from function.</p> <p>48. Practicing user defined functions, dynamic functions, variable scope.</p> <p>49. Practice on accessing variable with the global statement, Function calls with the static statement.</p> <p>50. Practice on setting default</p>	<p>PHP (Hyper Text Pre Processor)</p> <ul style="list-style-type: none"> • Introduction to PHP, its features and advantages. • Basic PHP Syntax, tags, Data types, Constants and Variables, Operators and expressions. • PHP Conditional Events, Flow control and looping in PHP. • Functions in PHP, Arrays and Strings in PHP. • Super Global Variables in PHP. Form handling and validations.

		<p>values for arguments, passing arguments to a function by value, passing arguments to a function by reference and testing for function existence.</p> <p>51. Practicing the Writing to the browser, getting input from forms.</p> <p>52. Practice on Output buffering, Session handling.</p> <p>53. Practice on Regular expression, Common math, Random numbers.</p> <p>54. Practice on File upload, File download.</p> <p>55. Practice on Environment variables, E-mail in PHP.</p> <p>56. Practice on The anatomy of a cookie, setting a cookie with PHP.</p> <p>57. Practice on deleting a cookie, creating session cookie.</p> <p>58. Practice on working with the query string, creating query string.</p> <p>59. Practice on starting a session, working with session variables, destroying session.</p> <p>60. Practice on passing session Ids, encoding and decoding session variables.</p> <p>61. Practice on creating and deleting a file, reading and writing text files.</p> <p>62. Practice on working with directories in PHP, checking for existence of file, determining file size.</p> <p>63. Opening a file for writing, reading, or appending, writing Data to the file, reading characters.</p> <p>64. Working with forms super global variables, the server array.</p>	
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		<p>65. A script to acquire user input, importing user input, accessing user input.</p> <p>66. Combine HTML and PHP code, using hidden fields, redirecting the user, file upload and scripts</p> <p>67. Working with Regular Expressions, the basic regular expressions PCRE, matching patterns, finding matches, replace patterns, Modifiers, breakup Strings.</p> <p>68. Working with Classes and Objects, objects oriented programming, define a class, an object. Creating an object, object properties, object methods.</p> <p>69. Working with Object constructors and destructors, Class constants, Class inheritance, Abstract classes and methods, Object serialization.</p> <p>70. Checking for class and method existence, Exceptions, Iterators.</p>	
<p>Professional Skill 90Hrs;</p> <p>Professional Knowledge 24Hrs</p>	<p>Install and configure MySQL; and practice on MySQL syntax for database design.</p>	<p>My SQL</p> <p>71. Installation of MySQL.</p> <p>72. Configuration of MySQL.</p> <p>73. Server Client architecture.</p> <p>74. Practice on Table Creation Rules.</p> <p>75. Practice on MySQL syntax and creating database design.</p> <p>76. Practice on data migration.</p> <p>77. Importing and exporting formats.</p> <p>78. Practice on data tunnelling.</p> <p>79. Practice on Database repair and archival.</p> <p>80. Practice on cross database syntax equivalents.</p>	<p>My SQL</p> <ul style="list-style-type: none"> • Introduction to MySQL. • Table Creation Rules. • Dropping a Table. • The SQL-INSERT Command. • Inserting NULL. • Viewing data (SQL-SELECT). • Updating Data in a table (The SQL-UPDATE command). • Deleting rows of data (The SQL-DELETE command). • Viewing the structure of an already existing table (SQL-DESCRIBE command).

			<ul style="list-style-type: none"> MySQL Scripting.
Professional Skill 30Hrs; Professional Knowledge 12Hrs	Create a table and manipulate data using query language.	Database and Table Creation 81. Practicing on Creation and use of database, Data type, Creation of table. 82. Practice on Data integrity, DDL statement, DML statement, Primary key and foreign key, constraints. Insert, Update, Delete Query 83. Practicing on simple insert query and insert query using select. 84. Practicing on Update query, Delete query.	Database and Tables <ul style="list-style-type: none"> Various data types. Data integrity. DDL statement. DML statement. Primary key and foreign key constraints
Professional Skill 30Hrs; Professional Knowledge 12Hrs	Select data from table using 'select' query and maintain database.	Selection of Data (using select query) 85. Select all data. 86. Select specific column. 87. Customize the display (change the col name in display). 88. Concatenate the text value in the output. 89. Calculating the column. 90. Practice on where clause. 91. Practice on arithmetic operation, comparisons operator, and/ or operator. 92. Practice on Range, In and not in Like operator. 93. Practice on Null value, order by Top value of the table, Distinct.	Selection of Data (using select query) <ul style="list-style-type: none"> Queries -selection of data. Where clause. Arithmetic operation Range. In and not in. Like operator. Null value. Use of order by. Top value of the table. Distinct <ul style="list-style-type: none"> The SELECT Statement The WHERE Clause Using ORDER BY to Sort Data The GROUP BY Clause <ul style="list-style-type: none"> Joining Table
Professional Skill 90Hrs; Professional Knowledge 24Hrs	Perform transactions in database using SQL programming.	Transact-SQL Programming 94. Practice on Aggregate and Group by –Min, Max, Sum, Count, Group by, Compute and compute by Pivot. 95. Practice on Joins - Inner join, Outer join and its type, Cross join, Equi join, Self join. 96. Practice on Sub queries – and exists, Nested sub queries,	Transact-SQL Programming <ul style="list-style-type: none"> Overview of Transact-SQL. Using Built-In Functions. Controlling Flow. Ranking Results. Limiting Results using TOP. Inner Joins with 2 or more tables. LEFT, RIGHT, FULL Outer joins.

		<p>Correlated sub queries.</p> <p>97. Practice on Constraints - Primary key constraint, unique key constraint, foreign key constraint, Check constraint, Default constraint.</p>	<ul style="list-style-type: none"> • Working with String Functions. • Working with Date Time functions. • Using ROWNUMBER and RANK functions. • Using Aggregate Functions. • Changing Data Types using CAST and CONVERT. • Displaying alternate values using CASE. • Using Common Table Expressions. • Writing Recursive Queries using Common Table Expressions. • Aggregate and Group by Min, Max, Sum, Count, Group by Compute and compute by Pivot. • Joins - Inner join, Outer join and its type, Cross join, Equi join, self join. • Sub queries - Use of sub queries, Using in and exists, Nested sub queries, Correlated sub queries. • Constraints - Primary key constraint, Unique key constraint, foreign key constraint, Check constraint, Default constraint.
<p>Professional Skill 40Hrs;</p> <p>Professional Knowledge 12Hrs</p>	<p>Implement XML data and use it in SQL server.</p>	<p>Query and manage XML data</p> <p>98. Understand XML data types and their schemas and interop w/, limitations and restrictions.</p> <p>99. Implement XML schemas and handling of XML data.</p> <p>100. XML data: how to handle it in SQL Server and when not to use it, including XML</p>	<ul style="list-style-type: none"> • Limitations of relational data. • Introduction to semi-structured data and XML. • XML query languages. • Principles of XML query processing.

		namespaces. 101. Import and export XML. 102. XML indexing.	
Professional Skill 40Hrs; Professional Knowledge 12Hrs	Design an online Database System using open source software tools.	Open Tools in Database Systems 103. Create an online database using any one of Open Tools Postgre SQL (Or) Ingres (Or) Fire Bird, (Or) Cubrid (Or) ISQL.	<ul style="list-style-type: none"> • Introduction to Open Tools in Database Systems such as Postgre SQL or Ingres or Fire Bird, Cubrid, ISQL.
Professional Skill 50Hrs; Professional Knowledge 12Hrs	Secure a Database System applying Information Security, Security Threats, Security Vulnerabilities and Risk Management.	Overview of Information Security 104. Practice on Information Security. Overview of Security threats 105. Practice on Security Threats. Information Security Vulnerabilities 106. Practice on Security Vulnerabilities. Risk Management 107. Practice on Risk Management. Securing Database 108. Practice on Securing Database.	Overview of Information Security <ul style="list-style-type: none"> • Understanding Information Security - Need of the Information security, Basics of IS (CIA). • History and evolution of IS, Dimensions of Information Security, Intranet/Internet, Information Security and Cyber Security relationship. • Why Care About Security? - Challenges to Information Security, Benefits of Information of Security. • Understanding techniques to enforce IS in an organization, Identifying tools to enforce Information Security, Identifying frameworks to enforce Information Security. Overview of Security threats <ul style="list-style-type: none"> • Overview of Information Security Threats, Types of threats – DDoS, Malicious codes, Espionage, etc. • Identification of Threats - Probing of threats, scanning of threats, Modus Operandi, Sources of Threats, External threats,



			<p>internal threats.</p> <ul style="list-style-type: none">• Best Practices or Guidelines used to Identify Threats - Conduct regular education and awareness trainings for employees and third parties.• Best Practices or Guidelines used in mitigation of threats, deploying up to date technology.• Maintaining Systems and Procedures, Educating Users, Conducting regular education and awareness trainings for employees and third parties.• Collaborate with peers and experts through different forums to understand contemporary issues and solutions. <p>Information Security Vulnerabilities</p> <ul style="list-style-type: none">• Why do Information Security Vulnerabilities exists - Types of Technical Vulnerabilities, Types of Native Vulnerabilities, Understanding Security Vulnerabilities.• Flaws in Software or Protocol Designs, Weaknesses in How Protocols and Software Are Implemented, Weaknesses in System and Network Configurations, Weaknesses in Web or Cloud applications, Weaknesses in Online e-transactions.
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		<ul style="list-style-type: none">• Browser Security and Role of cookies and pop-ups, Security holes in Browser, Web Applications, OS, and Smart phones, Identifying role of Social sites and media in cyber security and vulnerability.• Understanding Vulnerability Assessment Tools and Techniques, Techniques to Exploit Vulnerabilities, Techniques to Fix the Vulnerabilities, Identify security vulnerabilities on a regular basis using requisite tools and processes.• How to fix the security gaps and holes, Identifying liabilities of service providers, software vendors, Software authors, system owners, and third parties.• Best Practices and Guidelines to mitigate security Vulnerabilities <p><i>Risk Management</i></p> <ul style="list-style-type: none">• What is Risk? Relationship between Threat, Vulnerability, and Risk. What Is the Value of an Asset? What Is a Threat Source/ Agent?• Examples of Some Vulnerabilities that Are Not Always Obvious. What Is a Control? What Is Risk Likelihood and consequences? What Is Impact? Control Effectiveness.
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		<ul style="list-style-type: none">• Risk Management, Purpose of Risk Management, Risk Assessment (Phases). Why Is Risk Assessment Difficult?• Types of Risk Assessment, Different Approaches to Risk Analysis, Best Practices and Guidelines in Assessing and Calculating Risks.• Develop and implement policies and procedures to mitigate risks arising from ICT supply chain and outsourcing, Best Practices and Guidelines in Mitigating Risk. <p>Securing Database</p> <ul style="list-style-type: none">• Database Security Issues - Controlling Access, Database Integrity, Administrative Controls, Securing Database from Server Failures.• Redundancy and availability of Database, Types of attacks, Protection against Viruses and malware.
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Professional Skill 50Hrs; Professional Knowledge 12Hrs	Implement Database System backup and restoring backup.	<p>Taking Backup</p> <p>109. Practice on configure and maintain back up strategy, manage different back up models.</p> <p>Restoring Backup</p> <p>110. Practice on restoring a database to point in time.</p> <p>111. Practice on Restoring from a corrupted drive.</p> <p>112. Practice on Restoring in, create a restore strategy for redundant server.</p>	<p>Taking Backup</p> <ul style="list-style-type: none"> • Planning Backups. • Performing a Backup. • Designing Your Backup Strategy. <p>Restoring Backup</p> <ul style="list-style-type: none"> • Restoring User-Defined Databases. • Recovering System Databases.
Professional Skill 50Hrs; Professional Knowledge 12Hrs	Implement Database System security by creation of roles and functions for Database Users.	<p>Security of Database: Creation of roles and functions</p> <p>113. Manage logins and server roles Configure server security; secure the SQL Server using Windows Account / SQL Server accounts, server roles; create login accounts.</p> <p>114. Manage access to the server, SQL Server instance and databases; create and maintain user-defined server roles; manage certificate logins.</p> <p>115. Manage database permissions Configure database security; database level, permissions; protect objects from being modified.</p> <p>116. Manage users and database roles; Create access to server / database with least privilege; manage security roles for users and administrators.</p> <p>117. Create database user accounts; contained login; Troubleshoot security; Manage certificates and keys; endpoints.</p>	<p>Security of Database: Creation of roles and functions</p> <ul style="list-style-type: none"> • Identifying the Security Features of SQL Server. • Creating Login Accounts. • Assigning Login Accounts as Database Users. • Implementing Statement and Object Permissions. • Defining Linked Servers.



Professional Skill 50Hrs; Professional Knowledge 12Hrs	Configure and use Web Server, Reporting Services tools.	<i>Administrating reports with reporting services (Apache Server)</i> 118. Web Server configuration Manager. 119. Web Server surface area configuration. 120. Web server management studio. <i>Reporting services tools</i> 121. Report manager. 122. Reporting services configuration. 123. Report services command line utilities.	<i>Reporting Services</i> <ul style="list-style-type: none">• Tour of Features• Reporting Services Architecture• Reporting Services Terminology• Reporting Services Editions• Deconstructing Reporting Services• Shared Data Sources• Creating Reports from Scratch• Deploying Reports and Data Sources• Exporting Reports and Printing• Using the Web-Based Report Manager.
Industrial Visit/ Project Work Broad Areas: <ul style="list-style-type: none">• Preparation of Database Project in any Industry/ Organization using MySQL.			

SYLLABUS FOR CORE SKILLS
1. Employability Skills (Common for all CTS trades) (120 Hrs)

Learning outcomes, assessment criteria, syllabus and Tool List of Core Skills subjects which is common for a group of trades, provided separately in www.bharatskills.gov.in / dgt.gov.in

List of Tools & Equipment			
DATABASE SYSTEM ASSISTANT (for a batch of 24 trainees)			
S No.	Name of the Tools and Equipment	Specification	Quantity
A. TRAINEES TOOL KIT			
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	1 No.
2.	Server for LAN	Latest 32/64 bit processor or Higher with PCI Express Video Card, 4 GB VRAM, 4 GB RAM expandable, 19" TFT, Keyboard, Mouse, DVD OR BLU-RAY WRITER with latest Paper license of OS - Server Edition: Internet, Antivirus / Total Security - Server Edition & UPS for Power Back up.	1 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/ 4 GB DDR3 or Higher. 4) 320 GB / 500 GB HDD or Higher. 5) 19" TFT Monitor / Higher 6) DVD Writer 7) PS2 / USB Key Board , USB/Optical Mouse with latest Paper	12 Nos.

		Licensed Operating System / OEM Pack(Preloaded) Professional/Ultimate Edition with Internet Facility.	
4.	Network Terminator	(NT1) /Switch	1 No.
5.	Terminal Adapter	(TA)/Switch	1 No.
6.	Network Interface Card	Ethernet Card 10/100/1000 Mbps	4 Nos.
7.	Fire extinguisher	Arrange all proper NOCs and equipments from Municipal/Competent authorities.	
8.	Vacuum Cleaner (For IT & ITES Sector)		1 No.
9.	DLP Projector/Multimedia Projector/Interactive Smart Board		1 No.
10.	Laser Printer (One Network Printer)		2 Nos.
11.	Inkjet Printer (Multifunctional)		1 No.
12.	Different Expansion Cards		1 Each
13.	Switch /Router	24 port	1 Each
14.	Off – line UPS FOR NODES and server		As required
15.	Air Conditioner		As required
16.	Broad Band connection or Internet connection		1 No.
17.	Networking cables		As Required.
B. SOFTWARE (LATEST VERSION)			
18.	Windows O.S./ Linux	(Latest version) Network Support with 10 User license professional/ academic edition	1 No.
19.	MS Office	latest version / Open Office 10 user license professional/academic edition (along with MS access and MS Front page)	1 No.
20.	Anti Virus	Latest version/ Total Security software with (10 User License) and CLAMAV	1 No.
21.	Visual Studio	(Latest Version) with 10 user license	1 No.
22.	MY SQL Server	Open source	1 No.
23.	Apache server		1 No.
24.	Front Page Editor	Academic edition with 10 user license	1 No.
C. LIST OF OTHER ITEMS/ FURNITURE			
25.	Computer Tables		12 Nos.
26.	Instructor Table		1 No.
27.	Instructor's Chair		1 No.
28.	Chairs (Computer Chairs)		24 Nos.



29.	Steel cupboards drawer type		3 Nos.
30.	Cabinet with drawer		2 Nos.
31.	Pigeon hole cabinet -16 compartments		1 No.
32.	Steel almirah big size		1 No
33.	Steel almirah small size		2 Nos.
34.	Class room chairs with writing pad moulded type		24Nos.
D. TRAINEE TOOL KIT			
35.	Screwdriver	Set of min. 5 bits (Combination of star & minus) + 1 ext. rod	1 Set
36.	Crimping Tool for BNC and RJ-45 connectors		1 No. Each
37.	Punching Tool		1 No.
Note: - <i>1. Internet facility is desired to be provided in the class room. Latest version of hardware and software should be provided.</i> <i>2. All Software should be Network Version.</i> <i>3. Some of Course Related CBTs can be purchased (Optional)</i>			

The DGT sincerely acknowledges contributions of the Industries, State Directorates, Trade Experts, Domain Experts, trainers of ITIs, NSTIs, faculties from universities and all others who contributed in revising the curriculum.

Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

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S No.	Name of the member with Post (Shri /Smt/Ms)	Organisation	Position in SMC
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4.	Deepak Jain, Senior VP & Global Head-Work Force Planning	WIPRO, Doddakannelli, Sarjapur Road, Bangalore - 560 035	Member
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20.	Dr Vijayarajeswaran, Managing Director	VI Micro Systems Pvt. Ltd, Chennai	Member
21.	Pramod Tripathi, SEO	National Institute of Open	Member

		Schooling, Noida	
22.	Naresh Chandra, Jt. Director, DGT, HQ	DGT, New Delhi	Mentor
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24.	Sundar Rajan, DPA Gr. B	NIMI, Chennai	Representative of NIMI
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30.	B. Biswas, TO	RDAT Kolkata	Member
31.	Sanjay Kr. Gupta, VI –COPA	RVTI Vadodara	Member
32.	Kunal Shanti Priya, VI	ITI, Daltonganj, Jharkhand	Member
33.	Anwar Muhammed, VI	RVTI, Trivendrum	Member
34.	Sunil. M.K. TO	CTI, Chennai	Member
35.	Narmada, VI	RVTI, Bangalore	Member
36.	Rohit Sama, ATO	ITI Shantinagar, Hyderabad	Member
37.	J. Herman, Assistant Training Officer	Govt. ITI (W), Nagarkoil, TN	Member
38.	P. Parthiban, Assistant Training Officer (ITESM)	Govt ITI(W),Salem, TN	Member
39.	S. Raja, ADT	DET, Telangana	Member
40.	Mohd. Akram,	ITI, Shanthi Nagar, Hyderabad	Member
41.	Geeta Sikhen, VI	RVTI, Panipat	Member

ABBREVIATIONS

CTS	Craftsmen Training Scheme
ATS	Apprenticeship Training Scheme
CITS	Craft Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing
ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfism
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities

