

COMPUTER SOFTWARE APPLICATION

NSQF LEVEL- 4



SECTOR- IT &ITes

CRAFT INSTRUCTOR TRAINING SCHEME (CITS)



GOVERNMENT OF INDIA
Ministry of Skill Development & Entrepreneurship
Directorate General of Training
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
EN-81, Sector-V, Salt Lake City, Kolkata – 700091



COMPUTER SOFTWARE APPLICATION

Applicable for “Computer Operator & Programming Assistant (COPA)” and “Database System Assistant” Trade

(Non-Engineering Trade)

SECTOR – IT &ITeS

(Revised in 2024)

Version 2.1

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Developed By
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1. COURSEOVERVIEW

The Craft Instructors' Training Scheme is operational since inception of the Craftsmen Training Scheme. The first Craft Instructors' Training Institute was established in 1948. Subsequently, 6 more institutes namely, Central Training Institute for Instructors (now called as National Skill Training Institute (NSTI)), NSTI at Ludhiana, Kanpur, Howrah, Mumbai, Chennai and Hyderabad were established in 1960's by DGT. Since then the CITS course is successfully running in all the NSTIs across India as well as in DGT affiliated private institutes viz. Institutes for Training of Trainers (IToT). This is a competency-based course of one year duration. "Computer Software Application" CITS trade is applicable for Instructors of "COPA" and "Database System Assistant" trades.

The main objective of Crafts Instructor training programme is to enable Instructors explore different aspects of the techniques in pedagogy and transferring of hands-on skills so as to develop a pool of skilled manpower for industry, also leading to their career growth & benefiting society at large. Thus promoting a holistic learning experience where trainee acquires specialized knowledge, skills & develops attitude towards learning & contributing in vocational training ecosystem.

This course also enables the instructors to develop instructional skills for mentoring the trainees, engaging all trainees in learning process and managing effective utilization of resources. It emphasizes on the importance of collaborative learning & innovative ways of doing things. All trainees will be able to understand and interpret the course content in right perspective, so that they are engaged in & empowered by their learning experiences and above all, ensure quality delivery.

2. TRAINING SYSTEM

2.1 GENERAL

CITS courses are delivered in National Skill Training Institutes (NSTIs) & DGT affiliated institutes viz., Institutes for Training of Trainers (IToT). For detailed guidelines regarding admission on CITS, instructions issued by DGT from time to time are to be observed. Further complete admission details are made available on NIMI web portal <http://www.nimionlineadmission.in>. The course is of one-year duration. It consists of Trade Technology (Professional skills and Professional knowledge), Training Methodology and Engineering Technology/ Soft skills. After successful completion of the training programme, the trainees appear in All India Trade Test for Craft Instructor. The successful trainee is awarded NCIC certificate by DGT.

2.2 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.	Trade Technology	
	Professional Skill (Trade Practical)	480
	Professional Knowledge (Trade Theory)	270
2.	Training Methodology	
	TM Practical	270
	TM Theory	180
	Total	1200

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

3	On the Job Training (OJT)/ Group Project	150
4	Optional Course	240

Trainees can also opt for optional courses of 240 hours duration.

2.3 PROGRESSION PATHWAYS

- Can join as an Instructor in a vocational training Institute/ technical Institute.
- Can join as a supervisor in Industries.

2.4 ASSESSMENT & CERTIFICATION

The CITS trainee will be assessed for his/her Instructional skills, knowledge and attitude towards learning throughout the course span and also at the end of the training program.

a) The Continuous Assessment (Internal) during the period of training will be done by **Formative Assessment Method** to test competency of instructor with respect to assessment criteria set against each learning outcomes. The training institute has to maintain an individual trainee portfolio in line with assessment guidelines. 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 Method**. The All India Trade Test for Crafts Instructor for awarding National Craft Instructor Certificate will be conducted by DGT at the end of the year as per the guideline of DGT. The learning outcome and assessment criteria will be the basis for setting question papers for final assessment. The external 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 CRITERIA

Allotment of Marks among the subjects for Examination:

The minimum pass percent for Trade Practical, TM Practical, Soft Skill Practical Examinations and Formative assessment is 60% & for all other subjects is 40%. There will be no Grace marks.

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. While assessing, the major factors to be considered are approaches to generate solutions to specific problems by involving standard/non-standard practices.

Due consideration should also 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 of the following:

- Demonstration of Instructional Skills (Lesson Plan, Demonstration Plan)
- Record book/daily diary
- Assessment Sheet
- Progress chart
- Video Recording
- Attendance and punctuality
- Viva-voce
- Practical work done/Models
- Assignments
- Project work

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

Performance Level	Evidence
(a) Weightage in the range of 60%-75% to be allotted during assessment	
For performance in this grade, the candidate should be well versed with instructional design, implement learning programme and assess learners which demonstrates attainment of an acceptable standard of crafts instructorship with occasional guidance and engage students by demonstrating good attributes of a trainer.	• Demonstration of fairly good skill to establish a rapport with audience, presentation in orderly manner and establish as an expert in the field. • Average engagement of students for learning and achievement of goals while undertaking the training on specific topic. • A fairly good level of competency in expressing each concept in terms the student can relate, draw analogy and summarize the entire lesson. • Occasional support in imparting effective training.
(b) Weightage in the range of 75%-90% to be allotted during assessment	
For performance in this grade, the candidate should be well versed with instructional design, implement learning programme and assess learners which demonstrates attainment of reasonable standard of crafts instructorship with little guidance and engage students by demonstrating good attributes of a trainer.	• Demonstration of good skill to establish a rapport with audience, presentation in orderly manner and establish as an expert in the field. • Above average engagement of students for learning and achievement of goals while undertaking the training on specific topic.

	• A good level of competency in expressing each concept in terms the student can relate, draw analogy and summarize the entire lesson. • Little support in imparting effective training.
(c) Weightage in the range of more than 90% to be allotted during assessment	
For performance in this grade, the candidate should be well versed with instructional design, implement learning programme and assess learners which demonstrates attainment of a high standard of crafts instructorship with minimal or no support and engage students by demonstrating good attributes of a trainer.	• Demonstration of high skill level to establish a rapport with audience, presentation in orderly manner and establish as an expert in the field. • Good engagement of students for learning and achievement of goals while undertaking the training on specific topic. • A high level of competency in expressing each concept in terms the student can relate, draw analogy and summarize the entire lesson. • Minimal or no support in imparting effective training.

3. GENERAL INFORMATION

Name of the Trade	Computer Software Application -CITS
Trade Code	DGT/4004
NCO – 2015	4131.0600, 3514.0300, 2522.0100, 2521.0202, 2356.0100
NOS Covered	SSC/N9431, SSC/N9432, SSC/N9433, SSC/N9434, SSC/N9435, SSC/N9402, SSC/N9407, SSC/N9406
NSQF Level	Level-4
Duration of Craft Instructor Training	One Year
Unit Strength (No. Of Student)	25
Entry Qualification	Degree in Computer Science/ Computer Application/ Information Technology from AICTE/ UGC recognized Engineering College/ University. OR Post Graduate in Computer Science /Computer Application / IT from UGC Recognized University OR NIELIT “B” or equivalent from recognized Board/ University. OR PGDCA from UGC recognized University or NIELIT A Level. OR 03 years Diploma in Computer Science/Information Technology or equivalent after class 10th from AICTE/ recognized board of technical education. OR Ex-serviceman from Indian Armed Forces with 15 years of service in related field as per equivalency through DGR. OR 10th Class with 01-year NTC/NAC in COPA or DBSA.
Minimum Age	16 years as on first day of academic session.
Space Norms	84 sq. m
Power Norms	3.45 KW
Instructors Qualification for	
1. Computer Software Application - CITS Trade	B.Voc/ Degree in Computer Science/Information Technology or Post Graduate (Computer Science/ Computer Application/ Information Technology) or NIELIT “B” or equivalent from AICTE/ UGC recognized university / board with 2 years experience in relevant field.

	OR 03 year Diploma in Computer Science/ Information Technology or PGDCA from recognized university/ board with 5 years experience in relevant field. OR Ex-serviceman from Indian Armed Forces with 15 years of service in related field as per equivalency through DGR. Candidate should have undergone methods of Instruction of course or minimum 02 years of experience in technical training institute of Indian Armed Forces. OR NTC/ NAC passed in COPA trade with seven years experience in relevant field. <u>Essential Qualification:</u> Relevant National Craft Instructor Certificate (NCIC) in COPA trade in any of the variants under DGT.
2. Soft Skills	MBA/ BBA / Any Graduate/ Diploma in any discipline from AICTE/ UGC recognized College/ university with Three years' experience and short term ToT Course in Soft Skills from DGT institutes. (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above).
3. Training Methodology	B.Voc/ Degree in any discipline from AICTE/ UGC recognized College/ university with two years experience in training/ teaching field. OR Diploma in any discipline from recognized board / University with five years experience in training/teaching field. OR NTC/ NAC passed in any trade with seven years experience in training/ teaching field. <u>Essential Qualification:</u> National Craft Instructor Certificate (NCIC) in any of the variants under DGT / B.Ed /ToT from NITTTR or equivalent.
4. Minimum Age for Instructor	21 Years

4. JOB ROLE

Brief description of job roles:

Manual Training Teacher/Craft Instructor; instructs students in ITIs/Vocational Training Institutes in respective trades as per defined job role. Imparts theoretical instructions for the use of tools & equipment of related trades and related subjects. Demonstrate process and operations related to the trade in the workshop; supervises, assesses and evaluates students in their practical work. Ensures availability & proper functioning of equipment and tools in stores.

Computer Operator; operates computer and peripheral equipment to process business, scientific, engineering, or other data, according to operating instructions. Enters commands, using keyboard of computer terminal, and presses buttons and flips switches on computer and peripheral equipment, such as tape drive, printer, data communications equipment, and plotter, to integrate and operate equipment, following operating instructions and schedule. Loads peripheral equipment with selected materials, such as tapes and printer paper for operating runs, or oversees loading of peripheral equipment by Peripheral Equipment Operators. Enters commands to clear computer system and start operation, using keyboard of computer terminal. Observes peripheral equipment and error messages displayed on monitor of terminal to detect faulty output or machine stoppage. Enters commands to correct error or stoppage and resume operations. Notifies supervisor of errors or equipment stoppage. Clears equipment at end of operating run and reviews schedule to determine next assignment. Records problems which occurred, such as down time, and actions taken. May answer telephone calls to assist computer users encountering problem. May assist workers in classifying, cataloguing, and maintaining tapes.

Programming Assistant; installs, maintains and updates computer programs by making minor changes and adjustments to them under the guidance of computing professionals. Maintains and updates documents of computer programs and installations. Applies knowledge of principles and practices in the area of programming and computing in order to identify and solve problems arising in the course of their work. They may receive guidance from managers or professionals. May supervise other workers also.

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:-

- a) 2356.0100 – Manual Training Teacher/ Craft Instructor.
- b) 4131.0600– Computer Operator
- c) 3514.0300 –Programming Assistant
- d) 2522.0100 – Database Administrator
- e) 2521.0202 – Junior Data Associate

Reference NOS:

- i. SSC/N9431
- ii. SSC/N9432
- iii. SSC/N9433
- iv. SSC/N9434
- v. SSC/N9435
- vi. SSC/N9402
- vii. SSC/N9407
- viii. SSC/N9406
- ix. MEP/N9446

5. LEARNING OUTCOMES

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

5.1 TRADE TECHNOLOGY

1. Setup LAN and configure various network devices related software in a computer. (NOS: SSC/N9431)
2. Manage network application & secure network and practice on network architecture. (NOS: SSC/N9432)
3. Create and manage database file using MYSQL. (NOS: SSC/N9433)
4. Design and Develop web pages using Java Script. (NOS: SSC/N9434)
5. Design and Develop web pages using PHP. (SSC/N9435)
6. Demonstrate developing spread sheets by using advance formulae and demonstrate power tools. (NOS: SSC/N9402)
7. Design dynamic webpage using java (AWT, APPLET). (NOS: SSC/N9407)
8. Design programs with Python language. (NOS: SSC/N9406)
9. Exhibit effective communication skills with logical reasoning ability and quantitative aptitude to maximize efficiency in work. (NOS: MEP/N9446)

6. COURSE CONTENT

SYLLABUS FOR COMPUTER SOFTWARE APPLICATION–CITSTRADE			
TRADE TECHNOLOGY			
Duration	Reference Learning Outcome	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
Practical 60 Hrs Theory 30 Hrs	Setup LAN and configure various network devices related software in a computer. Manage network application & Secure network and practice on network architecture.	Demonstrate on 1. Straight Cabling and Cross cabling. 2. Switch Configuration. 3. LAN and WAN setup. 4. Setting TCP/IP.	Network Architecture • Layering & Protocols. • OSI & Internet Architecture. • Network topology • Link & Medium Access protocols, IEEE 802 standards, Performance issues • Network Adaptors. Circuit switching – packet switching. • Internetworking - bridges - Internet protocol - Addressing - Routing Protocols. • UDP - TCP- Congestion Control – Presentation aspects.
		Demonstrate on 5. Network Monitoring and Control (SNMP, V2, V3, RMON, RMON2). 6. Wireless Networking Design. 7. Implementing Voice over IP. 8. Configuring DHCP, IPV4/IPV6.	Applications & Network Management: • Telnet, FTP – e-mail – DNS. • Multimedia Applications • Security, Monitoring & Control • SNMP V2 and V3, RMON, RMON2. • The wireless channel - Link level design - Channel

			access Network design - Standards. • Optical Networks - Cross connects –LANS • Voice Over IP – Multimedia Networks. • Introduction to VPN and DHCP
		Demonstrate on 9. Configuring Network Security for preventing Attacks. 10. Setting password policy 11. Sniffing on Switched Networks 12. IP Address Spoofing 13. DNS Spoofing 14. Password Cracking: Dictionary vs Brute- Force vs Hybrid methods 15. Handling Denial of Service 16. Using Tools like John the Ripper, Cain &Abeletc. 17. Configuring Firewalls	Network Security • Attacks, Services and Mechanisms, Security Attacks, Security Services, Integrity check, Digital Signatures, Authentication. • Concept of Cryptography. • Hash Function • SSL Protocol • Intrusions and Viruses, Firewalls, Intrusion Detection. • Cyber security systems & cyber laws.
Practical 60 Hrs Theory 30 Hrs	Create and manage database file using MYSQL.	Demonstrate on 18. Installation of MySQL. 19. Troubleshooting basic installation issues. 20. Creation and use of database. 21. Designing of tables. 22. Applying data integrity rules. 23. Using the DDL, DCL and DML statements. 24. Enforcing constraints, primary key and foreign key. 25. Adding indices to Tables.	Database Concepts • Concept of DBMS, RDBMS. • Data Models, Concept of DBA, Database Users. • ER Model & Diagram, Database Schema. • Designing Database using Normalization Rules. • Various data types Data integrity, DDL DML and DCL statements. • Enforcing Primary key and foreign key. • Adding Indices.
		Demonstrate on	Queries

		26. Simple select queries. 27. Insert and delete queries Update queries.	• Concepts of Transactions • ACID Property of Transaction Constraints.
		Demonstrateon 28. Using the Number, Date and Character functions. 29. Joins, Group by, Having, Sub query. 30. Indexing and Optimizing Query.	Joins and Functions • Joining of tables • Sub Queries • Functions used in query like sum, average, max, min, count etc. • Indexing and Query Optimization.
		Demonstrateon 31. Creating and using stored procedures. 32. Creating and executing MySQL table level triggers. 33. Creating cursors in MySQL. 34. Using cursors in MySQL. 35. Implementing MySQL security. 36. Simple application on Database using SP, Triggers, Cursors and Indexing.	Stored Procedures, Triggers and Cursors • Introduction to Stored Procedures. • Introduction to Triggers and Cursor. • Creating Trigger • Creating Cursor • Using Cursor
Practical 40 Hrs Theory 20 Hrs	Design and Develop web pages using Java Script.	Demonstrateon 37. Using the Java Script Syntax. 38. Using Variables, Operators and Writing Expressions 39. Programming with Control Flow statements 40. Creating and using Objects in JavaScript 41. Creating and using Functions 42. Using Java Script with Forms	Introduction to Java Script • Introduction to JavaScript. • Java Script Syntax, Variables, Operators and Expression. • Control Flow. • Functions • Concept of Object oriented Development. • Concept of DOM. • Forms and JavaScript.
		Demonstrateon	Java Script and dynamic web

		43. Creating Cookies with JavaScript 44. Creating CSS 45. Error Handling in JavaScript 46. Implementing an AJAX application	pages • Concept of Cookies • Cascaded Style Sheets • Error Handling in JavaScript • Concept of AJAX
Practical 155 Hrs Theory 40 Hrs	Design and Develop web pages using PHP.	PHP (Hyper Text Pre Processor) 47. Demonstrate on-Paginators, popovers, progress, spinner. 48. Demonstrate on Table, toasts, tooltips. 49. Demonstrate on Bootstrap Styling essentials like Breakpoints for components, layouts and grid systems. Practice on typography, floats, flex, alignment, borders, position of elements, shadow and visibility. 50. Perform Installation of Apache Web Server Practice simple PHP programs. Practicing on programming to test events. 51. Demonstrate on if statement Using the else clause with if statement, switch statement Using the? operator, while statement, do while statement, for statement, Breaking out of loops, Nesting loops. 52. Demonstrate on Function and returning value from function, user defined functions, dynamic	PHP (Hyper Text Pre Processor) • PHP, its features and advantages • Basic PHP Syntax, tags, Data types, Constants and Variables, Operators and expressions. • Paginators, popovers, progress, spinner • Table, toasts, tooltips • Bootstrap styling essentials and its use. Explain typography, floats, flex, Alignment, borders, position of elements shadow and visibility in bootstrap. • PHP Conditional Events, Flow control and looping in PHP • Functions in PHP • PHP MySQL connection-Get connected with mysqli_connect • Password encryption with SHA in online forms • Cookies in PHP • Captcha text generation

		functions, variable scope, accessing variable with the global statement, Function calls with the static statement, setting default values for arguments, Passing arguments to a function by value, Passing arguments to a function by reference, Testing for function existence. 53. Demonstrate the Writing to the browser, Getting input from forms, Output buffering, Session handling, Regular expression, Common math, Random numbers, File upload, File download, Environment variables.	
		54. Demonstrate on E-mail in PHP, anatomy of a cookie, setting a cookie with PHP, deleting a cookie, creating session cookie, working with the query string, creating query string, starting a session, Working with session, variables, Destroying session, passing session IDs, Encoding and decoding session variables. 55. Demonstrate on Creating and deleting a file, Reading and writing text files, working with directories in PHP, checking for existence of	

		file, determining file size, opening a file for writing, reading, or appending, Writing Data to the file Reading characters. 56. Work With Forms - Super global variables the server array A script to acquire user input, importing user input Accessing user input, Combine HTML and PHP code., using hidden fields, 57. Demonstrate redirecting the user, File upload and scripts. 58. Demonstrate Regular Expressions - The basic regular expressions, PCRE, Matching patterns, Finding matches, Replace patterns, Modifiers, Breakup Strings. 59. Demonstrate working with Classes And Objects - Creating an object, Object properties, Object methods, Object constructors and destructors, 60. Perform class constants, Class inheritance, Abstract classes and methods, Object serialization, checking for class and method, existence, Exceptions, Iterators. 61. Connect to MySQL database from PHP and inset, delete & update data	
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		in MySQL database from webpage. 62. Create a project on PHP & MySQL for online library management.	
Practical 50 Hrs Theory 25 Hrs	Demonstrate developing spread sheets by using advance formulae and demonstrate power tools.	Advance data analysis using Excel – 63. Protect sheet using password. 64. Use flash fill techniques 65. Perform Goal Seek, solver & Scenarios on data 66. Use different types of cell references 67. Use R1C1 notation 68. Use array formula 69. Audit excel formula 70. Create and modify simple macros 71. Perform form controls and create simple data entry form with macros. 72. Look up data by using functions. 73. Use advanced date functions. Manage advanced charts and tables 74. Demonstrate advanced charts. 75. Demonstrate PivotTables. Use Power Query and Power BI 76. Demonstrate a Power Query, Power Query Function. Invoking the Power Query function and combining queries. Organize the workbook queries	Advanced Excel Sheet protection with password ● Flash Fill option ● Database access from MS Excel ● What if Analysis- Goalseek, Solver & Scenarios ● Macros & VBA ● Cell reference-Relative, Absolute, Row Absolute & Column Absolute. Reference from other sheet ● R1C1 Notation ● Using Name for cell range ● Excel formula error codes. ● Auditing tool in Excel ● Trace precedence & dependence. ● Formula evaluator ● Array formula in Excel ● Lookup formulas- Vlookup, Lookup, Index, Hlookup ● Excel settings in Registry ● Tips and tricks ● Pivot table and Pivot chart ● Conditional formatting ● Advanced Graphs ● Power Queries

		77. Demonstrate Power BI for simple data visualizations.	
Practical 75 Hrs Theory 30 Hrs	Design dynamic webpage using java (AWT, APPLET).	78. Installing JAVA. 79. Setting the Class path. 80. Writing and Executing a simple JAVA Program to display "Hello". Demonstrate writing JAVA programs to: 81. Use various data types in JAVA. 82. Use various operators in JAVA. 83. Create and use Local, Instance and Class variables. 84. Read text from the keyboard using scanner class read text from the keyboard using console class.	Object Oriented Programming and JAVA Language - Object Oriented Programming with Core Java - Java Programming features - JVM, Byte codes and Class path - Java Program Development - Compilation and Execution of JAVA programs - Basic JAVA language elements – keywords, comments, data types and variables. - JAVA Arithmetic, Assignment, Relational, Logical, Increment / Decrement operators and expressions. - JAVA String Operators - JAVA Input and Output streams, System in, System out. - Input using Scanner class and Console class methods
		Demonstrate writing JAVA programs to : 85. Use the if and if ... else statements. 86. Use the Switch	JAVA Program Flow Control Decision making and flow control using if...then, if then else, nested if, switch case and the conditional

		statement. 87. Use the Do ... While and while – do loops. 88. Use the For Loop. 89. Use the Break and Continue Keywords. 90. Use the JAVA Numbers Class methods. 91. Use the JAVA Character Class methods. 92. Use the JAVA String Class methods. 93. Create and use arrays.	ternary operators in JAVA. • Loop control flow using while – do, do – while loops, for loop, using the break, continue statements. • Terminating the JAVA program. • JAVA Number, Character and String Classes. • Arrays in JAVA.
		Demonstrate writing JAVA programs to : 94. Create and use simple classes, objects and methods in JAVA. 95. Pass data and Objects to Methods. 96. Return data and Objects from Methods. 97. use constructors in JAVA 98. Create and use Overloaded methods in JAVA. 99. Override methods in JAVA. 100. Create and use Super class, Sub class in JAVA.	JAVA Classes, Overloading and Inheritance • JAVA Objects, Classes and Methods. • Passing data and objects as parameters to methods. • Method Overloading. • Constructors and Overloaded constructors. • Inheritance in JAVA. • Method Overriding in JAVA.
		Demonstrate writing JAVA programs to : 101. Create and run a thread. 102. Create a thread by extending Thread class. 103. Create thread by implementing Runnable interface. 104. Use major thread methods. 105. Test multithreading with and without	Multithreading and Exception Handling in JAVA • Thread concept and life cycle of thread. • Extending thread class and using thread methods • Thread priority and runnable Interface • Multithreading and Synchronization • Exception Handling

		synchronization. 106. Handle common exceptions. 107. Use multiple try – catch blocks. 108. Use the “throw” and “finally” keywords handle user defined exceptions.	concepts and hierarchy • Exception types and methods • Concepts of “try, catch and throw and finally” in exceptions. • User defined exceptions
		109. Create and use virtual methods. 110. Create abstract classes and methods. 111. Create interfaces in JAVA. 112. Override methods in JAVA. 113. Create and implement an interface. 114. Extend interfaces in JAVA. 115. Create and use a package in JAVA.	Abstract Classes and Interfaces in JAVA • Concept of Virtual methods. • Concept of Abstract classes and methods • Features of Abstract Classes • JAVA Interfaces and their advantages • Method Overriding in JAVA • Polymorphism in JAVA • Creating , implementing and extending interfaces • Creating and using Packages in JAVA.
		Demonstrate writing JAVA programs to : 116. Create a simple container using Frame class and extending another Frame class. 117. Create a container with a few controls. 118. Create a container with controls with action listeners and event handlers. 119. Create a GUI to draw different plane shapes over a predefined area.	Abstract Windowing Tool Kit • Introduction to user interface and AWT components and containers • Introduction to AWT UI controls, hierarchy and their features • Introduction to event handling • Introduction to event handling classes • Introduction to event listener interfaces • Introduction to AWT

			Layouts
Practical 40 Hrs Theory 20 Hrs	Design programs with Python language.	Programming language (Python) 120. Install, set up the environment & run Python. 121. Use Command Line and IDE to create and execute a python program. 122. Write and test a python program to demonstrate print statement, comments, different types of variables. 123. Write and test a python program to perform data and data type operations, string operations, date, input and output, output formatting and operators. 124. Determine the sequence of execution based on operator precedence. 125. Construct and analyze code segments that use branching statements. 126. Construct and analyze code segments that perform iteration. 127. Document code segments using comments and documentation strings. 128. Write program in python using list, tuples, dictionaries and files. 129. Write a python program depicting argument passing and using tuples, dictionaries as	Programming language (Python) (30 Hrs) ● Introduction to Python History ● Features, Setting up path Basic Syntax, Comments, Variable ● Different Data Types ● Casting, string, Boolean ● Python Operators ● Conditional Statements ● Looping ● Control Statements, String Manipulation, Lists, Tuple, sets ● Dictionaries ● Arrays ● Iterators, modules, dates, math, ● Modules, Input and Output. ● Functions & arguments ● Modules ● Exception Handling ● Built in Functions in Python. ● File handling in Python. ● Python Architecture. ● Documentation in Python.

		arguments. 130. Write a python program for importing a module. 131. Use exception handling in python program. 132. Write a python program to use built in functions i.e. chr, cmp, compile, dir, eval, filter, hash, input, len, locals, long, max, pow, range, slice, tuple, Unicode, vars. 133. Write a python program to read and write into a file. 134. Write a python program depicting argument passing and using tuples, dictionaries as arguments. 135. Construct and analyze code segments that include List comprehensions, tuple, set and Dictionary comprehensions. 136. Perform basic operations using built-in modules. 137. Solve complex computing problems by using built-in modules.	
SOFT SKILLS: 75 Hrs.			
Professional Knowledge Soft Skills- 75 Hrs.	Exhibit effective communication skills with logical reasoning ability and quantitative aptitude to maximize efficiency in work	COMMUNICATION SKILLS: Oral communication Skills, Voice, accent, Voice modulation, pace, Intonation, etc. Study of different pictorial expressions of non-verbal communication and its analysis. Demo on Strengths and Weaknesses Demo on Motivation, Positive attitude. Practice on personal appearance, Dressing Manners & Etiquettes. Practice on attending of mock interview of different types. Listening & doubt clarifying etc.	

		Case studies on Interview sessions. <u>Communication & Listening Skills</u> Components of effective communication, Types of communication- Oral, Written, Reading & body language, Handling of communication, Barriers of communication, Listening Tools & Speaking Tools, Non-verbal communication and its importance. <u>Self-Management & Personality Development</u> Self-Management, SWOT analysis, self-learning and management. Motivation and Image building Techniques <u>Personal Grooming & Hygiene</u> Presentation of Self, Formal & Informal Dressing, Dressing for Occasions. <u>Techniques of Attending Interviews</u> Interview & its types. Preparation for the interview, stages of interview. Do's & Don'ts in an interview. BASIC MATHEMATICAL CALCULATION: Conversions of different units viz. length, area, mass etc. Simple Problems on Perimeter and area of a triangle, a circle, a square, rectangle, semicircle etc. Simple Problems on Comparing quantities, weight, speed, height, age, ratio, percentage, and price, etc. Simple calculation on profit and loss statement, discount calculations of products. Demonstration of utilization of mobile apps for financial transactions. Exercises on aptitude/puzzles Practice on Types of Charts and Graphs Introduction to units and dimensions of different objects. Perimeter, Area of regular shapes, viz. Triangle, Square, and Circle, rectangle, semicircle etc. <u>Quantitative Aptitude</u> Introduction, Comparing quantities viz. Speed, age, height, ratio, percentage, weight, and price, etc. Introduction to cost price, sale price, profit, loss and discounts of products. Introduction to online internet banking mechanisms, various modes of payments, cash transactions and associated mobile apps. Concept of insurance and taxes and types. Personal saving and investment mechanism. <u>Logical reasoning</u> Introduction to logical reasoning. Types of logical reasoning. Principles of logical reasoning with examples on numbers and sequences, arrangement and
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		relations, <u>Data Interpretation</u> Data analysis and interpretation. Types of variables for different applications. Basic graph types (Bar, Line, PIE Charts). ENERGY & ENVIRONMENT: Video demo on different types of energy resources. Conventional & Non-Conventional Energy Resources. Fossil Fuel, Biomass, Bio-Gas, Solar, etc. Public awareness on Energy conservation and use of clean energy. ENGLISH LITERACY: Pronunciation of simple words, Diction (use of word and speech) Transformation of sentences, Spellings. Reading and understanding simple sentences about self, work and environment. Construction of simple sentences Writing simple English, Speaking with preparation on self, on family, on friends/ classmates, on work. Role-playing and discussions on current affairs. Job description. Practice of Taking messages, passing on instructions. Practice making Resumes or curriculum vita. Letters of application &referencing to previous communication.

SYLLABUS FOR CORE SKILLS

1. Training Methodology (Common for all trades) (270Hrs + 180Hrs)

Learning outcomes, assessment criteria, syllabus and Tool List of Core Skill subjects which is common for all the CITS trades, provided separately in www.bharatskills.gov.in/dgt.gov.in

7. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
TRADE TECHNOLOGY	
1. Setup LAN and configure various network devices related software in a computer. (NOS: SSC/N9431)	Crimp Cross and straight Cable using Rj45.
	Install and configure Server-Client Network and all related protocol services.
	Configure network devices.
	Configure DHCP(ipv4,ipv6)
2. Manage network application & secure network and practice on network architecture.(NOS:SSC/N9432)	Managing Server Network Security.
	Manage server using various cryptography concept.
	Network security and monitoring.
	Setting password policy.
	Configure Firewall (Hardware and Software).
3. Create and manage database file using MYSQL.(NOS: SSC/9433)	Create a database of any School, College or Company using DDL,DML AND DCL.
	Relate two tables using ER model & Diagram.
	Relate two table using Primary Key & Foreign Key.
	Evaluating Database and Application architectures with the help of ACID Transaction.
	Combine rows from two or more tables, based on a related column between them using JOIN.
	Reuse the code over and over again using stored procedure.
	Insert a row into a specified table or when certain table columns are being updated using SQL Trigger.
	Structuring a relational database using normalization.
	Use Constraints in database.
	Create a SQL query using INDEX Statement.
	Create cursor in processing row by row.
4. Design and Develop web pages using Java Script.(NOS: SSC/N9434)	Design a dynamic webpage using various operators in java scripts.
	Design a dynamic webpage in java scripts using various control statement and looping structure.
	Design a dynamic webpage using function in java script.
	Design a dynamic webpage using forms validations in java scripts.
	Create cookies for client side system.
	Design a dynamic webpage using CSS.
	Handle compile time, runtime and logical errors while writing

	programs in java scripts.
	Create dynamic webpage using AJAX.
5. Design and Develop web pages using PHP. (NOS: SSC/N9435)	Use of CSS to Configure backgrounds, border, box model, font, text, column and colors, Table, speech, list & markers, animations, transitions, UI and pseudo-class.
	Managing pseudo-element, absolute measurement, relative measurement, angles, time, frequency and colors by CSS. Modifying selector types, outline, 3D / 2D transform, generated content, line box, hyperlink, and positioning by CSS.
	Practice using Java Script in an HTML Document, Hiding Java Script from old Web Browsers.
	Basic Syntax Used in Java Script Commands, Variables - Assigning Values to Variables, Concatenating String Variables.
	Installation of Apache Web Server Practice simple PHP programs. Practicing on programming to test events.
	Practicing the Writing to the browser, Getting input from forms, Output buffering, Session handling, Regular expression, Common math, Random numbers, File upload, File download, Environment variables.
	Practice on Creating and deleting a file, Reading and writing text files, Working with directories in PHP, Checking for existence of file, Determining file size, Opening a file for writing, reading, or appending, Writing Data to the file Reading characters.
	Working with Classes And Objects -Creating an object, Object properties, Object methods, Object constructors and destructors, Class constants Class inheritance, Abstract classes and methods, Object serialization, Checking for class and method, existence, Exceptions, Iterators.
6. Demonstrate developing spread sheets by using advance formulae and demonstrate power tools. (NOS: SSC/N9402)	Create workbooks with advanced functionalities in Excel.
	Create advanced charts & Pivot Tables.
	Create output files using specific Power tool.
7. Design dynamic webpage using java (AWT, APPLET). (NOS: SSC/N9407)	Design webpage and application using object oriented programming concepts like inheritance, polymorphisms etc. using java.
	Design application in java by using data types operator and variables.
	Develop application using scanner and console class.
	Design webpage and application using conditional statement and oops.
	Develop application using Number, Character and String class.

	Design and develop application by using arrays and methods.
	Develop and design dynamic webpage using multithreading.
	Design dynamic webpage using AWT and APPLETS.
8. Design programs with Python language. (NOS: SSC/N9406)	Install Python / Java.
	Perform operations on Python / Java; construct simple code and document these.
	Perform Document code segments using comments and documentation strings.
	Perform operations using in-built modules / libraries.
9. Exhibit effective communication skills with logical reasoning ability and quantitative aptitude to maximize efficiency in work. (NOS: MEP/N9446)	Demonstrate reasonable quantitative aptitude and interpret data in the field of work
	Demonstrate effective communication skills with logical reasoning ability.
	Describe method of energy conservation and day-to- day contribution to work for optimum utilization of resources.
	Demonstrate English language fluency while carrying out official work.

8. INFRASTRUCTURE

LIST OF TOOLS AND EQUIPMENT FOR COMPUTER SOFTWARE APPLICATION- CITS			
S No.	Name of the Tool &Equipment	Specification	Quantity
A. TRAINEES TOOL KIT			
1.	Desktop computer	CPU: 32/64 Bit i3/i5/i7 or latest processor, Speed: 3 GHz or Higher. RAM:-4 GB DDR-III or Higher, Wi-Fi Enabled. Network Card: Integrated Gigabit Ethernet, with USB Mouse, USB Keyboard and Monitor (Min. 17 Inch. Licensed Operating System and Antivirus compatible with trade related software.	26Nos. (25 for lab and one for classroom)
2.	Laptop	Latest Ci5 Processor, 4GB RAM,1TB HardDisk,Win8 Preloaded Licensed OS,2GB Graphics Card, DVD Writer, Standard Ports And Connectors.	01 No.
3.	Wi-Fi Router	24Port Switch With Wireless Connectivity option	01 No.
4.	Structured cabling (to enable working with Wired Networks too for Practical)		As required
5.	Internet or Intranet Connectivity		As required
6.	Laser Printer Monochrome A4 Size		01 No.
7.	Network Monochrome Laser Printer A4 Size		01 No.
8.	Optical Scanner	(Flatbed A4)	01 No.
9.	DVD or Blu-Ray Writer		02 Nos.
10.	LCD / LED (Or Latest) Projector with matte (antiglare) screen		02 Nos. (One each for classroom and lab)
11.	UPS		As required
12.	Cable crimping tool		02 Nos.
13.	Standalone Hard Disks	500 GB or Higher	02 Nos.

14.	Network Rack		01 No.
15.	Standard ScrewDriver Set		02 Nos.
16.	LAN Setup		As required
B. SOFTWARE PER UNIT			
17.	MySQL Open Source		12 Users
18.	PHP Open Source		12 Users
19.	JDK Open Source		12 Users
20.	Python Open Source		12 Users
21.	Browser Open Source		12 Users
22.	Web Server	Apache Server /Any HTTP Web server / XAMPP or any other similar server Open Source	12 Users
23.	WYSIWYG Web Designer or Dreamweaver or any Open source tools like Kompozer, FrontPage express / Word press or similar tools along with FTP tools for ex. Filezilla etc.		12 Users
24.	MS OFFICE 2010 or Latest Version		12 Users
25.	Antivirus software - licensed		12 Users
C. CONSUMABLES			
26.	White Board Markers		As required
27.	Duster Cloth	(2'by 2')	As required
28.	Cleaning Liquid	500ml	As required
29.	Xerox Paper	(A4)	As required
30.	Full Scape Paper(White)		2 reams
31.	Cartridges for printer		As required
32.	RJ45 Jacks		200 Pcs
33.	Optical Mouse(USB/PS2)		As required
34.	Key Board (USB/PS2)		As required
35.	SMPS		As required
36.	CMOS Batteries		As required
37.	3Pin Power Chord		As required
38.	Cat6/5/5e cable		100 meters
39.	Stapler Small		2 Pcs
40.	Stapler Big		1 Pc
41.	AAA battery for remote		As required
42.	AA battery for clock		As required
43.	Pen Drives	8 GB	2Nos

44.	CDs		50Nos
45.	DVDs		50 Nos.
46.	Wall Clock		1Pc
D. FURNITURE AND ACCESSORIES			
47.	Hand Held Vacuum cleaner		01 No
48.	Pigeon hole cabinet: 25 compartments		01 No
49.	Chair and table for the instructor		01 each-for Class room& lab
50.	Dual Desk or Chair and Tables for Trainees for Class Room		25 NO
51.	Computer table laminated top	150 X 650 X 750 mm (or similar size) with sliding tray for key board and one shelf for storage for the lab	14 Nos. (13 for lab and 1 for classroom)
52.	Operators chair (mounted on castor wheels, Adjustable height) for the lab		25 Nos.
53.	Printer table	650 X 500 X 750 mm can be varied as per local specifications	03 Nos.
54.	Split type Air conditioners		As required
55.	Storage cabinet	60 X 700 X 450 mm	01 Nos.
56.	White Board		02 nos. 01 each-for Class room& lab
57.	Steel Almirah		01 No.

Note:

Provision must be made for:

- 1. Domain name registration and its renewal from time to time for hosting and testing the websites created by the trainees as part of the syllabus.*
- 2. Licensed Antivirus software - Renewal or new procurement, as the situation demands, from time to time upon expiry of validity period.*

