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SYLLABUS FOR THE TRADE OF

SOFTWARE TESTING ASSISTANT

(IT & ITES SECTOR)

Designed in 2014

by

Ministry of Labour and Employment

Directorate General of Employment and Training

New Delhi

GENERAL INFORMATION FOR SOFTWARE TESTING ASSISTANT TRADE

Name of Sector	IT&ITES
Name of CTS COURSE	Software Testing
CTS Code	
Competency as per N C O Code	
Duration of Course	One year divided in two semesters of six months each
Entry Qualification of Trainee	Class 12 th Pass with Science & Maths
Unit size (No. Of trainees)	20
Power Norms	3.45 KW
Space Norms (Workshop)	70 sq.m
Qualifications for the instructor	Degree in Engineering in Computer Science/IT, MCA with one year Experience in relevant field OR Diploma in Engineering in Computer Science/IT, BCA, NIELIT A Level with two years of experience in relevant field OR NTC/ NAC in Software Testing Trade with three years of Experience in relevant field and Craft Instructor Training Certificate in trade if available.

Objectives

On completion of the course the trainees should be able to:-

- To use computer efficiently with software applications.
- Meets the requirements that guided its design and development
- Satisfied the needs for stake holders
- Use essential characteristics of testing tool used for test Automation
- Ensure the quality of product by Manual and Automated testing.

Job Roles

- Data entry operator
- Test Engineer
- Test Analyst
- Front office Assistant
- Customer and Technical support related to Testing Tools

Syllabus for the Trade of Software Testing Assistant under C.T.S.

First Semester

Duration: Six Months

Week	Practical Skills	Theory Topics
1-2	<p>WINDOWS</p> <p>Working with Windows Operating System.</p> <p>Working with Windows Explorer, Managing Folders and Files</p> <p>Copying and Moving Files and Folders.</p> <p>Using Common Tools and Programs</p> <p>Customizing the Windows 7 Desktop, start menu, Using the removable drives, Compressing files. Working with Window Accessories Calculator, Paint and Snipping Tool. Viewing the properties of the computer and the hardware installed.</p>	<p>COMPUTER FUNDAMENTALS</p> <p>History & Generations of Computers.</p> <p>Types of Computers.</p> <p>Advantages, disadvantages and applications of Computers.</p> <p>Hardware and Software Concepts, Introduction to the functions of an Operating System. Popular Operating systems in use. Features of Windows OS.</p> <p>Features of the various types of Input and Output Devices in Use, Using Scanner and Printer.</p>
3	<p>Linux</p> <ul style="list-style-type: none"> • Working with Linux OS • Using Basic commands like ls, mkdir, rm, mv, cp, whoami, who, grep, • vi editor 	<p>Introduction to Open Source Software.</p> <ul style="list-style-type: none"> • Introduction to Linux Operating System and its structure. • Files and Processes in Linux. • Directory structure of Linux O.S. • Advantages of Linux Operating System. • Various Linux Shells. • Basic Linux commands.
4-6	<p>WORD PROCESSING SOFTWARE</p> <p>Document Basics, Creating a New Document, Saving, Editing and Formatting Documents. Using the commands in the Home, Insert, Design, Page Layout, Mailings, View Menus. Creating documents with various objects and formatting objects.</p>	<p>INTRODUCTION TO OFFICE.</p> <p>MS Word Fundamentals</p> <p>Introduction to the MS Word Screen, Ribbons, Microsoft Office Button and Quick Access Toolbar.</p> <p>Using Keyboard Commands and Contextual Menus. Using Word Help.</p>

7-9	<p>SPREADSHEET Create, open, edit and format workbooks Create Excel Sheets for various situations like Marks, Salary and Sales etc. Using Functions of various categories. Relative and Absolute Cell Referencing. Sort and Filter Data. Validate data. Create Macros. Import Data from different sources. Create data tables, Pivot tables and charts. Excel Sheet Page Set up and Printing Techniques.</p>	<p>Introduction to MS Excel. Introduction to Data Types and Cell referencing. Use of functions of various categories. Linking Sheets.</p>
10-12	<p>DATABASE - ACCESS</p> <ul style="list-style-type: none"> • Create Tables • Queries • Relationships • Reports • Macros and Forms. 	<p>Concepts of Data, Information and Databases. Overview of popular databases, RDBMS, OODB and NOSQL. Rules for designing good tables. Integrity rules and constraints in a table. Relationships in tables. Introduction to MS Access Database. Create Tables, Queries, Relationships, Reports, Macros and Forms.</p>
13	<p>COMPUTER NETWORK Viewing Network connections. Connecting a computer to a network and sharing of Devices, Files and Folders. Using the ping command. Internet, Email, Setting up video conferencing.</p>	<p>INTRODUCTION TO COMPUTER NETWORKS. Necessity and Advantages of networking. Client Server and peer to Peer networking concepts. Network topologies. Introduction to LAN, WAN and MAN. Network components, viz. Modem, Hub, Switch, Router, Bridge, Gateway etc.</p>
14-17	<p>WEB PAGE DESIGN Designing Static Web Pages</p> <ul style="list-style-type: none"> • Designing simple web pages with text, pictures, tables, lists, hyperlinks, frames, marquees etc using HTML tags. • Designing Web Pages with Forms and Form Controls using HTML tags. • Using a WYSIWYG web design tool to design and edit web pages. With various styles. 	<p>WEB DESIGN CONCEPTS</p> <ul style="list-style-type: none"> • Concepts of Static and Dynamic Web pages. • Introduction to HTML and various tags in HTML. • Creating Forms with controls using HTML. • Concepts of CSS.

Information Security

- Video show on Information Security

Overview of Security threats

- Video show on Security Threats
- Mock test on security threats

Information Security Vulnerabilities

- Video show on Security Vulnerabilities

Risk Management

- Video show on Risk Management
- Mock test on Risk Management

Overview of Information Security

- 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

- Overview of Information Security Threats
- Types of threats
- Best Practices or Guidelines used to Identify Threats
- Maintaining Systems and Procedures

Information Security Vulnerabilities

- Why do Information Security Vulnerabilities exists - Types of 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
- Identifying role of Social sites and media in cyber security and vulnerability

Risk Management

- What is Risk?
- Relationship between Threat, Vulnerability, and Risk
- Risk Management
- Risk Assessment (Phases)
- Why Is Risk Assessment Difficult?

		<ul style="list-style-type: none"> • Types of Risk Assessment • Best Practices and Guidelines in Assessing and Calculating Risks
19-22	<p>Java Script VARIABLES, DATA TYPES AND OPERATORS</p> <ul style="list-style-type: none"> • Describe variables and literals • List the data types supported by JavaScript • List the operators supported by JavaScript • Describe expressions • Use Regular Expressions • Use Arrays <p>JAVASCRIPT STATEMENTS</p> <ul style="list-style-type: none"> • Create applications using JavaScript statements • Use conditional and loop statements to control the application. • Create user-defined functions <p>USING OBJECTS</p> <ul style="list-style-type: none"> • Use Browser objects • Use JavaScript objects • Use HTML input elements <p>HANDLING EVENTS</p> <ul style="list-style-type: none"> • Explain Events objects • List common events • Create event handlers in JavaScript 	<p>JAVA SCRIPT</p> <ul style="list-style-type: none"> • Introduction • Describe Java Script • Differentiate between Client- Side and Server – Side Application • Differentiate between JavaScript and Java • Integrate JavaScript in HTML • Variables,data Types and Operators • JavaScript Statements • Using Objects • Handling Events
23-24	Project Work on Static and Dynamic Web pages	
25	Revision	
25	Examination	

Syllabus for the Trade of Software Testing Under C.T.S.

Second Semester

Duration: Six Months

Week No.	Practical	Theory
	<p>TESTING TECHNIQUES</p> <ul style="list-style-type: none"> • Criticality of requirement, special tests –complexity, • GUI, compatibility, • security, recovery, installation, error handling, • smoke, sanity, parallel and execution testing 	<p>INTRODUCTION TO SOFTWARE TESTING QUALITY CONTROL (STQC)</p> <ul style="list-style-type: none"> • Definition, approaches, • testing during development life cycle • test policy • test planning • categories of defect • configuration management • Risk analysis.
2	<p>Quality Methods (implement in test cases) Seiri, - Sort Seiton – Set in Order Seiso – Spic & Span (Shine) Seiketsu : Standardise Shitsuke : Self Discipline (Sustain)</p>	<p>INTRODUCTION TO 5 S AND KEIZEN MODULE Seiri, - Sort Sort through and sort out junk, seldom-used items and necessary items. Seiton – Set in Order Physically mark a place for everything and keep everything in its place</p> <p>Seiso – Spic & Span (Shine) Keep workplace & machine spic & span while at the same time inspect for abnormalities, if any Seiketsu : Standardise Define and standardize work processes, 5S activities and tasks.</p> <p>Shitsuke : Self Discipline (Sustain) Make 5S a way of life, one should train everybody in the organisation so that doing 5S becomes self-discipline</p>

3-7	<p>MANUAL TESTING</p> <ul style="list-style-type: none"> • unit Testing • Alpha & Beta Testing • Regression Vs Retesting • White Box Testing • White Box V/s Black Box • Verification& Validation • Black Box Testing • Acceptance Testing • Non Functional Testing • Usability Testing • Stress Testing • Load Testing • Performance Testing • Diff b/w above 3 <p>Performance Testing</p>	<p>OBJECTIVES AND PRINCIPLES OF TESTING</p> <ul style="list-style-type: none"> • Test Management • Testing Models • Test Strategy • Testing Life Cycle • Testing Methodologies • Facts and Myth
8-11	<p>INTRODUCING WINRUNNER (WINDOWS AUTOMATED TESTING TOOL)</p> <ul style="list-style-type: none"> • The Benefits of Automated testing • Understanding the testing process • Exploring the win Runner window <p>SETTING UP THE GUI MAP</p> <ul style="list-style-type: none"> • How does win runner identify GUI objects • Spying on GUI map mode • Choosing a GUI map mode • Using the Rapid Test script wizard <p>RECORDING TESTS</p> <ul style="list-style-type: none"> • Choosing a record mode • Recording a context sensitive test • Understanding the text script • Recording in analog mode • Running the test • Analyzing test results 	<p>AUTOMATING TEST EXECUTION</p> <ul style="list-style-type: none"> • Testing and test automation • The V model • Tool support for life-cycle testing • The promise of test automation, Common problems of test automation • The limitations of automating software testing, Script Preprocessing, Scripting • Techniques

- Recoding tips

SYNCHRONIZING TESTS

- When should you synchronize
- Creating a test
- Changing the synchronization setting
- Identifying a synchronization problem
- Synchronizing the test
- Running the synchronized test

CHECKING BITMAPS

- How do you check a bitmap
- Adding bitmap checkpoints to a test script
- Viewing expected results
- Running the test on a new version
- Bitmap checkpoint tips

PROGRAMMING TESTS WITH TSL

- How do you program tests with TSL
- Recording a basic test script
- Using the function generator to insert functions
- Adding logic to the test script
- Understanding tl-step
- Debugging the test script
- Running the test on a new version

CREATING DATA-DRIVEN TESTS

- How do you create data-driven tests
- Converting your test to a data driven test
- Adding data to the data table
- Adjusting the script with regular information

	<ul style="list-style-type: none"> • Running the test and analyzing result • Data driven testing tips <p>READING TEXT</p> <ul style="list-style-type: none"> • How do you read text from an application • Reading text from an application • Teaching fonts to win runner • Verifying text • Running the test on a new version • Text checkpoint tips <p>CREATING BATCH TESTS</p> <ul style="list-style-type: none"> • What is a batch test • Programming a batch test • Running the batch test on version IB • Analyzing the batch test results • Batch test tips <p>MAINTAINING YOUR TEST SCRIPTS</p> <ul style="list-style-type: none"> • What happens when the user interface changes • Editing object descriptions in the GUI map adding GUI objects to the GUI map • Updating the GUI map with the run wizard 	
12-16	<p>LOAD RUNNER (WINDOWS AUTOMATED TESTING TOOL)</p> <ul style="list-style-type: none"> • load test planning • the load runner controller at a glance • creating a scenario • using rendezvous points • configuring a scenario • configuring a host • preparing to run a scenario • managing scenarios using test director 	<p>TOOLS TO AUTOMATE TESTING</p> <ul style="list-style-type: none"> • Selecting tools requirements • tool market • tool selection project team • Identifying requirements • Identifying constraints • Identifying tools availability in market • Evaluating the candidate tools

	<ul style="list-style-type: none"> • running a scenario • online monitoring • runtime and transaction online monitors • resource monitoring • web performance monitors • network monitoring • understanding load runner analysis • exporting analysis data • analyzing scenario activity • analyzing scenario performance • cross scenario analysis • web Vuser graphs 	
17-22	<p>(WEB AUTOMATED TESTING TOOL)Selenium-IDE</p> <ul style="list-style-type: none"> • Installing the IDE • Opening the IDE • IDE Features • Menu Bar, Toolbar, Test Case Pane • Log/Reference/UI-Element/Rollup Pane • Log,Reference,UI-Element and Rollup • Building Test Cases • Recording • Adding Verifications and Asserts With the Context Menu • Editing, Insert Command, Table View • Source View, Insert Comment, Table View, Source View>Edit a Command or Comment • Table View,Source View,Opening and Saving a Test Case • Running Test Cases • Using Base URL to Run Test Cases in Different Domains • Selenium Commands – “Selenese” • Script Syntax 	<p>AUTOMATED COMPARISON</p> <ul style="list-style-type: none"> • Verification, • comparison, automation • comparators, dynamic comparison • Postexecution comparison • simple comparison, complex comparison • Test sensitivity – • comparing different types of outcomes – • comparison filters and guidelines – • Testware Architecture – • Automating pre and post processing – • Building maintainable tests

- Test Suites
- Commonly Used Selenium Commands
- Verifying Page Elements
- Assertion or Verification?
- Verify Text Present, verify Element Present
- Verify Text
- Locating Elements
- Locating by Identifier, Locating by Id
- Locating by Name, Locating by X Path
- Locating Hyperlinks by Link Text
- Locating by DOM, Locating by CSS
- Implicit Locators
- Matching Text Patterns
- Globbing Patterns, Regular Expression Patterns, Exact Patterns
- The “AndWait” Commands
- The waitFor Commands in AJAX applications
- Sequence of Evaluation and Flow Control
- Store Commands and Selenium Variables
- Store Element Present, store Text, Store Eval
- JavaScript and Selenese Parameters
- JavaScript Usage with Script Parameters
- JavaScript Usage with Non-Script Parameters
- echo - The Selenese Print Command
- Alerts, Popups, and Multiple Windows
- Alerts, Confirmations
- Debugging
- Breakpoints and Startpoints
- Stepping Through a Testcase
- Find Button

	<ul style="list-style-type: none"> • Page Source for Debugging • Locator Assistance • Writing a Test Suite • User Extensions • Format • Executing Selenium-IDE Tests on Different Browsers • Troubleshooting 	
23-24	Project Work on Tools	
25	Revision	
26	Semester Examination	

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

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

16	LAN Setup	As required
B. Software per Unit		
1	MS Office 2010 (professional) or the latest version available at the time of procurement	Multiuser
2	Antivirus for - clients / workstations in profile with validity of an year or more which should be renewed upon expiry	11 Licences
3	Open Office or equivalent.	Open source software
4	Testing Tools –win runner and load runner (windows based) selenium(web-based) open source	Multiuser(Academic version)
C. LIST OF OTHER ITEMS/ FURNITURE		
1	Vacuum cleaner	01 No
2	Pigeon hole cabinet : 20 compartments	01 No
3	Chair and table for the instructor -	01 each (for class room & laboratory)
4	Dual Desk or Chair and Tables for Trainees	10 / 20 Nos
5	Computer table laminated top 150X650X750 mm with sliding tray for key board and one shelf of storage	10 Nos
6	Operators chair (without arms mounted on castor wheels, adjustable height)	20 Nos
7	Wall clock	01 Nos
8	Printer table 650X500X750mm can be varied as per local specifications	03Nos
9	Window or Split type Air conditioners 1.5 tons	03Nos
10	Storage cabinet 60X700X450mm	01Nos
11	White Board.	01 No.
12	Steel Almirah	01 No.
13	Air Conditioners 1.5 ton	03 Nos.

Raw materials for a batch of 20 trainees for two semesters		
1	White Board Marker	As required
2	Duster Cloth(2' by 2')	As required
3	Cleaning Liquid 500 ml	As required
4	Xerox Paper (A4)	As required
5	Full Scape Paper (White)	2 reams
6	Cartridges for printer	As required
7	RJ 45 Jack	200 Pcs
8	Optical Mouse (USB/PS2)	As required
9	Key Board (USB/PS2)	As required
10	SMPS	As required
11	CMOS Batteries	As required
12	3 Pin Power Chord	As required
13	Cat 5/5e cable	100 meter
14	Stapler Small	2 pcs
15	Stapler Big	1 pcs
16	AAA battery for remote	As required
17	AA battery for clock	As required
18	8 GB pen drives	2 Nos
19	CDs	50 Nos
20	DVDs	50 Nos.
21	Wall Clock	1 pcs
