

1	Name of Course	<b>CERTIFICATE COURSE IN SOFTWARE TESTING (W.E.F. 2017-2018)</b>																																									
2	Course code	<b>101156</b>																																									
3	Max. No. of Students Per Batch	25 students																																									
4	Duration	6 Months																																									
5	Type	Part Time																																									
6	No of Days/Week	6 Days																																									
7	No of Hours Per Day	4 Hours																																									
8	Required Space	Class Room – 200 sq.ft, <u>Laboratory – 200 sq.ft</u> <b>Total – 400 sq.ft</b>																																									
9	Minimum Entry Qualification for Student	Diploma / Degree in computer Technology/ Computer Science / IT / Electronics & Telecommunication / Electronics/ BSc.IT/Comp/ BCA / MCA/ BCS/ ITI Copa																																									
10	Objective of Course	To Create man power for 1. To use computer efficiently with software application 2. Meets the requirements that guided its design and development 3. Satisfied the need for stake holders 4. Use essential characteristics of testing tool used for test Automation. 5. Ensure the quality of product by manual and automated testing.																																									
11	Employment Opportunity	1. Test Engineer 2. Test analyst 3. Customer and Technical support related to Testing Tools.																																									
12	Teacher's Qualification	Degree in computer engineering / Computer Science / Information Technology/ MCA/ with 2 year industrial Experience as test engineer / Test analyst in reputed industrial																																									
13	Training System	<b>Training System Per Week</b> <table border="1"><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>06 Hrs</td><td>18 Hrs</td><td>24 Hrs</td></tr></table>							Theory	Practical	Total	06 Hrs	18 Hrs	24 Hrs																													
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14	Exam. System	<table border="1"><tr><th>Sr. No.</th><th>Paper Code</th><th>Name of subject</th><th>Th /PR</th><th>Hours</th><th>Max. Marks.</th><th>Mini. Marks</th></tr><tr><td>1</td><td>10115611</td><td>Quality Analyst Program</td><td>TH-I</td><td>3 hrs.</td><td>100</td><td>35</td></tr><tr><td>2</td><td>10115621</td><td>Software Testing</td><td>PR-I</td><td>6 hrs.</td><td>200</td><td>100</td></tr><tr><td>3</td><td>10115622</td><td>Group Project</td><td>----</td><td>----</td><td>100</td><td>50</td></tr><tr><td></td><td></td><td><b>Total</b></td><td></td><td></td><td><b>400</b></td><td><b>185</b></td></tr></table>	Sr. No.	Paper Code	Name of subject	Th /PR	Hours	Max. Marks.	Mini. Marks	1	10115611	Quality Analyst Program	TH-I	3 hrs.	100	35	2	10115621	Software Testing	PR-I	6 hrs.	200	100	3	10115622	Group Project	----	----	100	50			<b>Total</b>			<b>400</b>	<b>185</b>						
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3	10115622	Group Project	----	----	100	50																																					
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## Theory - I - Quality Analyst Program

<b>1</b>	<b>Manual Testing</b>	
<b>Chapter No.</b>	<b>Chapter Title</b>	<b>Theory</b>
1	Quality Aspects & Software Application	Quality
		Quality Views
		Quality Attributes
		The way to see software applications
		Define Software application
		Application Business Area
		Application Architecture
		Application service model
		Application Categories
		Group discussion on topics
		Application Users and User expectations from Software Applications
		Application Technologies
		Interview questions
2	Software Development and It's Influence	Project Team and Responsibility
		Introduction of SDLC
		SDLC Phases and activities
		SDLC Models
		Software developments challenges
		Possible Issues in Application
		Group discussion on topic
		Interview questions
3	Basics of Software Testing	Define software Testing
		Types of Testing
		Verification
		Advantage of Verification
		Methods of verification (walkthrough & Review)
		Tools for Verification
		Exercise - SRS Review
		Review report format
		SRS Review outcome
		Software Testing tasks and participants
		Verification with V Model
		Validation
		Validation with V Model
		Verification Vs Validation
		Levels of Testing - Validation
		Unit Testing and advantages
		Integration Testing
		Integration Testing Approaches

		System Testing
		User Acceptance Testing
		Alpha Testing
		Beta Testing
		Distinguish between various Testing Levels
		Interview questions
4	Testing Techniques, Process and Plan	Black Box testing
		White Box Testing
		Gray Box testing
		Advantages of black box testing
		Challenges and Limitations of Black Box Testing
		Testing team structure
		Testing team- Roles & Responsibilities
		Software Testing Life Cycle
		STLC phases, activities and deliverables
		Exercise on Test Plan
		Interview questions
5	Test Design Process	Test design Activities
		Test Scenarios
		Understanding on Requirement study
		Test Scenario Benefits
		Exercise on Test Scenarios
		Define Test Case
		Identify test conditions
		Test conditions through Use cases
		Test conditions through Requirement
		The way to create Test Cases
		Exercise on Test Cases
		Test Data
		Test Data from ECP
		Test Data from BVA
		Error Guessing
		Negative Testing
		Test Case Review
		Test case Storage
		Test case- Best Practices
		Common Test case Mistakes
		Requirements Traceability Matrix (RTM)
		Interview questions
6	Test Execution Process	Test execution Activities
		Test execution preparation
		Smoke and Sanity Testing
		Difference in Smoke and Sanity
		Test Execution Cycle
		Retesting and Regression Testing

		Test Closure activity
		Test Summary report
		Interview questions
7	Other Testing Process	Non functional Testing
		Performance Testing
		Load Testing
		Endurance Testing
		Stress Testing
		Volume Testing
		Installation Testing
		Configuration Testing
		Compatibility Testing
		Configuration Vs Compatibility
		Security Testing
		Testing User experience
		User Interface (UI) Testing
		Usability Testing
		Accessibility Testing
		Localization Testing
		Testing codes & Databases
		Control flow graph
		Understanding code complexity
		White Box Testing
		Advantages White Box Testing
		Challenges and Limitations of White Box Testing
		Database
		Database Testing
		Types of Application & Testing types
		Interview questions
8	Defects Management	Understanding with Defect OR Bug
		Causes of defects
		Defect Attributes
		Defect Life Cycle
		Defect Severity
		Defect Priority
		Defect Reporting
		Advantages of Defect Tracking
		Defect Tracking tools
		Interview questions
9	Quality Management	Quality Management System
		Quality Assurance
		Quality Control
		QA Vs QC
		Customer is King
		Software Quality- Role of a Tester
		Software Testing Metrics
		Interview Questions

10	Final Aspects	Best Practices in testing
		Certifications in Testing
		Career Roadmap
		Manual Testers – Technical Skills
		Manual Testers – Behavioural Skills
		Regular Updation
		Interview questions
11		Query resolution and extra assignments

## Practical - I - Software Testing

<b>2</b>	<b>Practical</b>	
		<b>TESTING TECHNIQUES</b>
		Criticality of requirement special tests - complexity
		GUI, Compatibility
		Security, recovery, installation, error handling,
		smoke, sanity, parallel and execution testing
		<b>QUALITY METHODS</b>
		(impliment in test cases)
		Seiri, - sort
		Seition - Set in order
		Seiso - Spic & Span (Shine)
		Seiketsu : Statndardise
		Shitsuke : Self Discipline (Sustain)
		<b>MANUAL TESTING</b>
		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
		Performance Testing
		<b>INTRODUCING WINRUNNER(WINDOWS AUTOMATED TESTING TOOL)</b>
		<b>The Benefits of Automated testing</b>
		<b>Understanding the testing process</b>
		Exploring the win Runner window

		<b>SETTING UP THE GUI MAP</b>
		How does win Runner identify GUI objects
		Spying on GUI map mode
		Choosing a GUI map mode
		Using the Rapid Test script wizard
		<b>RECORDING TESTS</b>
		Choosing a record mode
		Recording a context sensitive test
		Understanding the text script
		Recording in analog mode
		Running the test
		Analyzing test results
		Recording tips
		<b>SYNCHRONIZING TESTS</b>
		When should you synchronize
		Creating a test
		Changing the synchronization setting
		Identifying a synchronization problem
		Synchronizing the test
		Running the synchronized test
		<b>CHECKING BITMAPS</b>
		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
		<b>PROGRAMMING TESTS WITH TSL</b>
		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
		<b>CREATING DATA-DRIVEN TESTS</b>
		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
		Running the test and analyzing result
		Data driven testing tips
		<b>READING TEXT</b>
		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

		<b>CREATING BATCH TESTS</b>
		What is a batch test
		Programming a batch test
		Running the batch test on version IB
		Analyzing the batch test results
		Batch test tips
		<b>MAINTAINING YOUR TEST SCRIPTS</b>
		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
		<b>LOAD RUNNER (WINDOWS AUTOMATED TESTING TOOL)</b>
		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
		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
		<b>(WEB AUTOMATED TOOL)Selenium-IDE</b>
		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
	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
	Globbering 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
	Java Module
	<b>VARIABLES, DATA TYPES AND OPERATORS</b>
	Describe variables and literals
	List the data types support by Java script
	List the operators supported by Java script
	Describe expressions
	Use Regular Expression
	Use arrays
	<b>JAVA SCRIPT STATEMENTS</b>
	Create applications using Javascript statements
	Use conditional and loop statements to control the application.
	Create user-defined functions
	<b>USING OBJECTS</b>
	Use Browser objects
	Use Javascript objects
	Use HTML input elements
	<b>HANDLING EVENTS</b>
	Explain Events objects
	List common events
	Create events handlers in Javascript
	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
	Page Source for Debugging
	Locator Assistance
	Writing a Test Suite
	User Extensions
	Format
	Executing Selenium-IDE Tests on Different Browsers
	Troubleshooting

## Group Project

<b>3</b>	<b>Projects</b>	
<b>Sr.No.</b>	<b>Project Title</b>	
1	Desktop Application	
2	Web Application	
3	Mobile applications	
	<b>Automation</b>	
<b>Sr. No.</b>	<b>Tools Name</b>	<b>Sub Titles</b>
1	Testlink	Introduction of TestLink
		Login to TestLink
		Creating a Test Project
		Creating a Test Plan
		Build Creation
		Creating Testsuite
		Creating a Testcase
		Assigning test case to test plan
		Creating Users and Assigning Roles in TestLink
		Writing Requirements
		Executing a test case
		Generating Test Reports
2	Bugzilla	Bugzilla Administration Account
		Bugzilla Client Account
		Creating Bugs
		Creating a BugReport
		Create graphical reports
		Search Option in Bugzilla
		Tracking with other project member
3	Selenium IDE	Introduction
		IDE Features
		Building Test Cases
		Running Test Cases
		Selenium Commands – “Selenese”
		Script Syntax
		Test Suites

		Commonly Used Selenium Commands
		Verifying Page Elements
		Assertion or Verification?
		Locating Elements
		Matching Text Patterns
		The “AndWait” Commands
		Store Commands and Selenium Variables
		Store Commands and Selenium Variables
		echo - The Selenese Print Command
		Alerts and Popups
		Debugging
		User Extensions
4	Java Module	
		<b>Sub Titles</b>
		Programming Concepts
		Java Basics
		Java Classes
		Langage fundamentals
		Inheritance and polymorphism
		Java Api support
		Exception Handling
		Collection and Generics
5	Automation Webdriver	
<b>Sr. No.</b>	<b>Tool Name</b>	<b>Sub Titles</b>
1	Webdriver	Introducing WebDriver
		How Does WebDriver ‘Drive’ the Browser Compared to Selenium-RC?
		WebDriver and the Selenium-Server
		Setting Up a Selenium-WebDriver Project
		Migrating from Selenium 1.0
		Introducing the Selenium-WebDriver API by Example
		Selenium-WebDriver API Commands and Operations
		Driver Specifics and Tradeoffs
		Selenium-WebDriver’s Drivers
		Alternative Back-Ends: Mixing WebDriver and RC Technologies
		Running Standalone Selenium Server for use with RemoteDrivers
		Additional Resources
		Next Steps
		Select class and action class
		Windows and popup handling
		Frame Handling
		Working with bulk elements
		File downloaded and attachment
		File Handling (Apache POI)
		Unit testing (TestNG)

	WebDriver: Advanced Usage
	Mobile Testing through webdriver
	Web application project handling with Webdriver
	Explicit and Implicit Waits
	Remote Web Driver
	Advanced User Interactions
	Browser Startup Manipulation
	HTML5
	Parallelizing Your Test Runs
	Test Design Considerations
	Introducing Test Design
	Types of Tests
	Validating Results
	Location Strategies
	Wrapping Selenium Calls
	UI Mapping
	Page Object Design Pattern
	Data Driven Testing
	DB Connection
	Database Validation
	Maven
	Framework (Hybrid or keyword ) with project

### **EQUIPMENT/SOFTWARE /TOOLS AND FURNITURE FOR A BATCH OF 25 TRAINEES**

<b>Sr. No.</b>	<b>A. Tool &amp; Equipment / Software Name</b>	<b>Quantity</b>
1	Desktop Computers of the latest configuration prevalent at the time of procurement or with the following minimum features : CPU : 32/64 Bit Core 2 Duo/Quad Core/i3/i5 , Speed :- 3 GHz or Higher. Cache Memory : - Minimum 3 MB or better. RAM :- 4 GB DDR-III or Higher. Hard Disk Drive :- 500GB or Higher,7200 rpm(minimum) or 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 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
13	Standalone Hard Disks	4 Nos.
14	Network Rack	2 Nos.
15	LAN Setup	As Required

Sr.No.	B. Software per Unit	Quantity
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 Liences
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 verison)

Sr.No.	C. LIST OF OTHER ITEMS/ FURNITURE	Quantity
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.

<b>Sr.No.</b>	<b>Raw materials for a batch of 25 trainees for two semesters</b>	<b>Quantity</b>
1	White Board Marker	As required
2	Duster Cloth(2' by 2')	As required
3	Cleaning Liquid 500 ml	As required
4	Xerox Paper (A4)	As required
5	Full Scape Paper (White)	2 reams
6	Cartridges for printer	As required
7	RJ 45 Jack	200 Pcs
8	Optical Mouse (USB/PS2)	As required
9	Key Board (USB/PS2)	As required
10	SMPS	As required
11	CMOS Batteries	As required
12	3 Pin Power Chord	As required
13	Cat 5/5e cable	100 meter
14	Stapler Small	2 pcs
15	Stapler Big	1 pcs
16	AAA battery for remote	As required
17	AA battery for clock	As required
18	8 GB pen drives	2 Nos
19	CDs	50 Nos
20	DVDs	50 Nos.
21	Wall Clock	1 pcs

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