

## **“JMeter - Core to Advanced Level” Course Contents**

### **Key Highlights of This Course: -**

- JMeter with Its Best Practices for Recording, Scripting, Enhancement, Execution, HTML Report Generation, Test Suite Preparation, & Others
- JMeter & HTTP(s) Protocol (Web Applications) Testing
- JMeter & HTTP(s) File Download & Upload Scenario
- JMeter & WebServices (REST & SOAP Api) Testing
- JMeter & Database Testing
- JMeter & Selenium WebDriver Test Plan
- JMeter & FTP Server Testing
- JMeter & SMTP Test Plan
- JMeter Functions
- URL Encoding & Decoding
- JMeter & BeanShell w.r.t. Java with use cases examples
- JMeter & Distributed Testing (Master & Slave)
- JMeter & PerfMon for Server Monitoring
- JMeter & Jenkins – a detailed Session
- JMeter & InfluxDB – Grafana Integration
- JMeter Directory's Files, Properties Files & Folders
- JMeter's Elements & Sub Elements with Plugins
- JMeter's End to End Scripting
- Correlation & Parameterization
- Regular Expression & Extractors with different use cases examples
- Test Execution & HTML Report Generation
- JMeter Test Suite Preparation & Execution
- JMeter from LoadRunner Perspective
- JMeter Intro & Pro Certification by BlazeMeter
- Using Latest Version of JMeter
- Many More

### **Course Contents in Detail: -**

- Introduction to Performance Testing
- Need for Performance Testing
- Performance Testing Concepts
- Need for Performance Testing Tools
- Protocol & Different Types of Protocols
- JMeter's Introduction, History, Protocols Supported & Its Features
- Java (JDK & JRE) Installation & Java System/Environment Variable (or Home Path) Setup
- JMeter Download, Installation & Launching on Windows, Mac & Linux OS
- JMeter 3 Launching Modes
- JMeter Application GUI/IDE Walkthrough
- Performance Testing Life Cycle with respect to JMeter

- Test Scenarios, Test Cases, Test Suite, Transactions, Recording, Enhancement, & Debugging
- HTTP(s) Protocol: - Request, Response, Headers, Request Methods, & Status Codes
- HTTP Response/Status Codes Types
- VUsers (or Threads), Think Time, Pacing, Ramp Up, Ramp Down
- Response Time, 90%, Throughput, Latency, Connect Time, Bandwidth
- Hits Per Second (HPS), Request Per Second (RPS), Transaction Per Second (TPS)
- JMeter's **12** Major Elements (or Components)
- Port & Proxy Server Setup & Recording from Different Browsers
- JMeter Certificate Installation in Different Browsers, Recording, & Certificate Regeneration
- HTTP(s) Test Script Recorder Element, Its Attributes, & Its Best Practices Settings
- JMeter's Recording Best Practices
- Set of Approaches when Recording is Not Happening in JMeter
- Saving Original Recordings to a File & Use of Brushes
- Walk-through of JMeter's Directory: - Various Files & Folders
- JMeter's Properties Files
- Undo, Redo, Changing Fonts Size, & Backup Features in JMeter
- Increasing View Results Tree's Line Limitation
- Increasing JMeter Certificate's Expiry Time
- JMeter Plugin Manager & Plugins Installation by **2** Ways
- Important JMeter Plugins
- Scenarios Identification & Documentation for Performance Testing of a Web Application (HTTP(s) Protocol)
- End to End Recording & Scripting of above Scenarios using JMeter
- JMeter's Best Practices for Scripting & Enhancement
- Different Types of Dynamic Values & Authorization Tokens & Their Handling
- Correlation & Parameterization
- Regular Expression in Detail
- Regular Expression Extractor with Its Attributes in Detail
- Realtime Use Cases Examples of Dynamic Values & Regular Expression Extractor
- Test Execution in Non-GUI Mode with Its Best Practices
- Understanding JMeter's Java Heap Size & Increasing It
- Understanding JMeter's Non-GUI Execution Commands
- Understanding Test Summarizer
- JMeter HTML Dashboard Report Generation in Non-GUI Mode with Its Best Practices
- Importance of JTL file
- HTML Report Generation from GUI Mode
- Effect of ""Generate Parent Sample" & "Apply Naming Policy"
- Changing "KO" & "OK" and Response Time Values to Seconds in HTML Report
- Decreasing the Summarizer Time, & Getting 70% Column in Reports
- Stopping Test Execution in Non-GUI Mode
- Test Execution & HTML Report Generation in GUI Mode
- Understanding JMeter HTML Report
- APDEX in JMeter HTML Report

- Graphs in JMeter HTML Report
- Parameterizing Important Parameters Using \_\_P() function & Why to Use this function?
- Passing Arguments from CLI in Non-GUI Execution
- Assigning Values from JMeter's "user.properties" File to User Defined Variables Declared using \_\_P() function & Using Them in Non-GUI Execution
- Creating Own Custom Properties File & Passing That Properties File from CLI in Non-GUI Execution
- Launching JMeter in GUI Mode with Custom Properties File's Inputs
- Running 2 or More Separate JMeter Test Scripts (or JMX Files) in One Go in Non-GUI Execution
- JMeter & Jenkins – a detailed Session
- Saving Complete Requests & Responses of a Test in Non-GUI & GUI Execution to a File
- Test Suite Preparation in JMeter with Best Practices
- Merge & Test Fragment
- User Load Distribution across different Scenarios of a Test Plan in JMeter
- Test Suite Execution & Its HTML Report Generation
- Scope of JMeter Elements & Variables
- Local & Global Variables
- Execution Order (or Presidency) of JMeter Elements
- 3 Ways to Take Help in JMeter for Its Elements & Functions
- Debugging of Script in JMeter: - 4 helpful options
- Types of Log Level & Increasing Log Viewers' Character Limitation
- Different Types of HTTP Requests & CRUD Operations: - GET, POST, PUT & DELETE
- BlazeMeter Organization & Plugins offered by It
- 3rd Party Ways of Recording & Exporting to JMeter: -
  1. Developer Tool (Manual or Custom Script Creation using cURL or HAR)
  2. Fiddler Tool
  3. BlazeMeter Chrome Plugin
  4. BadBoy Tool
- JMeter's Elements & Their Sub-Elements & Their Attributes in Detail: –
  1. **Test Plan**
  2. **Non-Test Elements:** -
    - 2.1.) HTTP(S) Test Script Recorder
    - 2.2.) Property Display
  3. **Threads (Users):** -
    - 3.1.) Thread Group
    - 3.2.) setUp Thread Group
    - 3.3.) tearDown Thread Group
    - 3.4.) Stepping Thread Group
    - 3.5.) Ultimate Thread Group
    - 3.6.) Concurrency Thread Group
  4. **Logic Controller:** -
    - 4.1.) Recording Controller
    - 4.2.) Transaction Controller

- 4.3.) Simple Controller
- 4.4.) Loop Controller
- 4.5.) Runtime Controller
- 4.6.) Random Controller
- 4.7.) Random Order Controller
- 4.8.) Interleave Controller
- 4.9.) Once Only Controller
- 4.10.) Parallel Controller
- 4.11.) Throughput Controller
- 4.12.) Switch Controller
- 4.13.) If Controller
- 4.14.) While Controller
- 4.15.) Module Controller
- 4.16.) Include Controller
- 4.17.) ForEach Controller
- 4.18.) Critical Section Controller

**5. Sampler: –**

- 5.1.) HTTP Request
- 5.2.) Debug Sampler
- 5.3.) Dummy Sampler
- 5.4.) JDBC Request
- 5.5.) FTP Request
- 5.6.) WebDriver Sampler
- 5.7.) Access Log Sampler
- 5.8.) SMTP Sampler
- 5.9.) Flow Control Action
- 5.10.) Mail Reader Sampler
- 5.11.) BeanShell Sampler
- 5.12.) OS Process Sampler

**6. Config Element: -**

- 6.1.) HTTP Header Manager
- 6.2.) HTTP Cookie Manager
- 6.3.) HTTP Cache Manager
- 6.4.) HTTP Request Defaults
- 6.5.) User Defined Variables
- 6.6.) CSV Data Set Config
- 6.7.) Random CSV Data Set Config
- 6.8.) Counter
- 6.9.) Random Variable
- 6.10.) HTTP Authorization Manager
- 6.11.) JDBC Connection Configuration
- 6.12.) FTP Request Defaults
- 6.13.) Driver Config Element

**7. Assertions: –**

- 7.1.) Response Assertion
- 7.2.) Duration Assertion
- 7.3.) Size Assertion

- 7.4.) JSON Assertion
- 7.5.) XPath Assertion
- 7.6.) HTML Assertion
- 7.7.) XML Assertion
- 7.8.) BeanShell Assertion

**8. Timer: -**

- 8.1.) Constant Timer
- 8.2.) Uniform Random Timer
- 8.3.) Gaussian Random Timer
- 8.4.) Poisson Random Timer
- 8.5.) Synchronizing Timer
- 8.6.) Constant Throughput Timer

**9. Listener: -**

- 9.1.) View Results Tree
- 9.2.) Aggregate Report
- 9.3.) Summary Report
- 9.4.) View Results in Table
- 9.5.) Aggregate Graph
- 9.6.) Response Time Graph
- 9.7.) Graph Results
- 9.8.) Simple Data Writer
- 9.9.) Save Responses to a file
- 9.10.) Assertion Results
- 9.11.) Backend Listener
- 9.12.) Mailer Visualizer
- 9.13.) PerfMon Metrics Collector
- 9.14.) Merge Results

**10. Pre-Processors: -**

- 10.1.) Sample Timeout
- 10.2.) User Parameters
- 10.3.) JDBC Pre-Processor
- 10.4.) BeanShell Pre-Processor
- 10.5.) HTML Link Parser

**11. Post Processors: -**

- 11.1.) Result Status Action Handler
- 11.2.) Debug Post-Processor
- 11.3.) JDBC Post-Processor
- 11.4.) Regular Expression Extractor
- 11.5.) Boundary Extractor
- 11.6.) JSON Extractor
- 11.7.) XPath Extractor
- 11.8.) BeanShell Post-Processor

- Big Billion Day/ Flash Sale/ Black Friday Scenario Simulation in JMeter
- Windows Authentication OR Browser Pop-Up Handling in JMeter
- Load/ Stress/ Endurance/ Spike/ Baseline Testing using JMeter
- IP Spoofing in JMeter (or Geo-Location Testing)

- Network Speed Simulation in JMeter (or Testing at Different Network Bandwidths)
- JMeter & PerfMon for Server Monitoring
- Distributed Load Testing in JMeter using Load Generators (LGs) in GUI & Non-GUI Modes (Master & Slaves Concept)
- Detailed Practical Session on below Protocols Testing using JMeter: -
  1. JMeter & HTTP(s) Protocol (Web Applications) Testing
  2. JMeter & HTTP(s) File Download & Upload Scenario
  3. JMeter & WebServices (REST & SOAP Api) Testing
  4. JMeter & Database Testing
  5. JMeter & Selenium WebDriver Test Plan
  6. JMeter & FTP Server Testing
  - Applying Assertion, Transaction Settings & HTML Report Generation for above Protocols.
- Understanding BeanShell in JMeter w.r.t. to Java using below use cases examples: -
  1. BeanShell Sampler, BeanShell Pre-Processor, BeanShell Post-Processor & BeanShell Assertion with examples
  2. log(), vars.get(), vars.put(), prev.get, ctx.get
  3. Logging/Printing Values to JMeter Log Viewer & JMeter Console
  4. Saving/Writing a Correlated Value to a File
  5. Saving/Writing Multiple Values to a File
  6. Test Data Preparation & Saving/Writing User Credentials to a File
  7. Test Data Preparation for only Success Transactions
  8. Saving/Writing User Credentials for Failed Users to a File
  9. Failing a Request based on certain Condition (E.g. of BeanShell Assertion)
  10. Saving Complete Response to a Variable
  11. Saving Single Value in Response to a Variable
  12. Looping a Transaction based on certain Condition
  13. Booking an Order till a Particular Value is Achieved in “Add to Cart” Transaction
  14. Etc.
- Error Handling in JMeter: - **3** different ways
- JMeter Other Tips & Tricks: -
  1. How to Increase Expiry Date of JKS file in JMeter for Distributed Testing?
  2. How to Ignore Embedded Resources Failures while Running the Test in JMeter?
  3. How to Record Think Time while Recording the Flow in JMeter?
  4. How to Use a Particular Browser’s Setting (or Change User Agent of a Particular Browser) in a JMeter Script?
  5. How to Open a JMX file by Double Clicking It?
  6. How to Create Own Custom Template in JMeter?
- JMeter & InfluxDB – Grafana Integration
- URL Encoding & Decoding
- JMeter Functions: –

1. \_\_TestPlanName
  2. \_\_threadNum
  3. \_\_threadGroupName
  4. \_\_samplerName
  5. \_\_machineIP
  6. \_\_machineName
  7. \_\_time
  8. \_\_timeShift
  9. \_\_log
  10. \_\_StringFromFile
  11. \_\_FileToString
  12. \_\_StringToFile
  13. \_\_counter
  14. \_\_dateTimeConvert
  15. \_\_intSum
  16. \_\_longSum
  17. \_\_changeCase
  18. \_\_Random
  19. \_\_RandomDate
  20. \_\_RandomFromMultipleVars
  21. \_\_RandomString
  22. \_\_UUID
  23. \_\_javaScript
  24. \_\_jexl3
  25. \_\_groovy
  26. \_\_beanShell
  27. \_\_P
  28. \_\_setProperty
  29. \_\_split
  30. \_\_V
  31. \_\_unescaped
  32. \_\_unescapeHtml
  33. \_\_escapeHtml
  34. \_\_urldecode
  35. \_\_urlencode
  36. \_\_escapeXml
  37. \_\_base64
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