

Software Functional Testing

Training Course Offered by The Westfall Team

Software Functional Testing is a 3-day course designed to provide an excellent knowledge base and practical skills for anyone interested in improving Software Functional (Black Box) Testing techniques and practices in their organization. This course starts with an overview of software testing basics, including discussions of the importance of software testing, the different levels of testing and basic testing principles. Basic testing terminology is defined. Techniques for ensure test coverage of requirements, different types of testing documentation and various test activities are discussed.

Course attendees will explore various techniques for performing functional testing of individual functions, user scenarios and of the operational profile. This course will also explore various issues involved in testing the software's nonfunctional requirements. This course also teaches the basics of software regression test analysis.

Method of Instruction: This course is taught through lecture and interactive discussion. Actual examples from the software industry are utilized to make the information relevant. Throughout this course, learned skills are practiced using team exercises. The emphasis of this course is on techniques that allow the attendees to transition the skills learned in this course to their own work environments.

Target Audience: Software testers, quality engineering, developer, project managers, functional managers and other software project stakeholders involved in test design, execution, planning and management, and who are interested in improving software testing practices in their organization.

Course Objectives: Upon successful completion of this course attendees will be able to:

- Understand the basic concepts of software testing
- Perform effective and efficient functional testing of software
- Select the appropriate tests to regression test your software after changes have been made

Detailed Outline:

I: Software Testing – The Basics

1. Why, When, What, & How of Testing
 - a. Why Test?
 - Testing Defined
 - Testing Software Products
 - Why is Testing Important?
 - Conformance to Requirements
 - Testing Finds Defects
 - Assess Quality & Reliability
 - Defect Prevention & Process Improvement

- Common-Defect Checklists
 - b. When to Test?
 - Levels of Testing
 - Testing Activities
 - Increasing Cost of Fixing Issues
 - c. What to Test?
 - d. How to Test?
 - Testing Principles
 - Factors Affecting Quality of Testing
2. Testing Terminology
 - Standardizing Testing Terminology
 - Mistakes, Faults & Failures
 - Testing, Debugging & Root Cause Analysis
 - Verification & Validation Defined
 - Software Verification & Validation
 - V&V Techniques – Static Analysis
 - V&V Techniques – Dynamic Analysis
 - Types of Testing
 - Test Bed
3. Test Coverage of Requirements
 - Where to Find Requirements
 - Traceability
 - Testability
 - Attributes of Testable Requirements
 - Test Matrix
4. Test Documentation
 - Benefits of Formal Test Documentation
 - Types of Testing Documentation
5. Test Activities
 - a. Test Activities
 - b. Participate in Peer Reviews
 - c. Test Planning & Design
 - Test Case Specification
 - Test Procedure Specification
 - d. Test Execution
 - Test Log
 - Test Incident Report
 - Test Summary Report
6. Standards & Models Related to Testing
 - Why Standards are Important
 - IEEE Standards Related to Testing
 - ISO 12207 & IEEE/EIA 12207on Testing
 - ISO 9001:2008 on Testing
 - SEI CMMISM on Testing

II: Functional (Black Box) Testing

1. What is Functional Testing?
 - Functional Testing Defined
 - Strengths of Functional Testing
 - Weaknesses of Functional Testing

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- Types & Levels of Requirements
 - 2. Testing the Functional Requirements
 - a. Testing Each Function
 - Create a Function List
 - Function List - Exercise
 - Function's Environment & Capability
 - Function's Environment
 - Understanding the Function's Capability
 - Environment & Capability - Example
 - Environment & Capability - Exercise
 - Input Testing
 - Equivalence Class Partitioning
 - Boundary Value Testing
 - Human/Hardware – Input Testing Checklist
 - Testing Outputs
 - Human/Hardware – Output Testing Checklist
 - Input & Output Testing - Exercise
 - Example Solution – Input & Output Testing Exercise
 - Forms for Input & Output Testing Exercise
 - Data Testing
 - Data Testing Checklist
 - Data Testing - Example
 - Computation Testing
 - Computation Testing Checklist
 - File System Interface Checklist
 - Software/OS Interface Testing
 - Testing for Memory Faults Checklist
 - Testing for Network Faults Checklist
 - b. Usage Scenario Testing
 - Steps to Defining Use Cases
 - Develop a Use Case for Each Interaction
 - Use Case - Example
 - Turning Use Cases into Test Scripts
 - Creating Tests from Use Cases – Exercise
 - c. Operational Profile Testing
 - Operational Profile - Example
 - Threads
 - Testing to the Operational Profile
 - 3. Testing Non-Functional Requirements
 - a. Usability Testing
 - Usability Characteristics
 - Usability Testing - Exercise
 - b. Software Reliability
 - c. Performance Testing
 - Race Conditions & Time Dependencies
 - Resource Utilization Testing
 - Normal Load, Volume & Stress Testing Compared
 - Load – Volume Testing
 - Load – Stress Testing
 - Performance Testing - Exercise
 - d. Safety Testing
 - Hazard Analysis
 - e. Security Testing
 - Security Testing - Exercise
 - f. Configuration Testing
 - Configuration Testing Matrix
 - Client/Server Architecture Testing
 - g. Localization Testing
 - Localization Checklist
 - 4. Functional Test Case Design
 - a. Cause & Effect Graphing
 - Step 1 – Break Down the Specification
 - Step 2 – Identify Causes & Effects
 - Step 3 – Create Cause-Effect Graphs
 - Step 4 – Annotate Graphs with Constraints
 - Step 5 – Convert Graphs into Limited-Entry Decision Table
 - Step 6 – Convert Decision Table into Test Cases
 - b. State Transition Testing
 - State Transition Diagram – Examples
 - State Transition Testing
 - Event/Response Table – Example
 - Event/Response Table – Exercise
 - c. Exploratory Testing
 - 5. Functional Test Execution
 - a. Unit/Component Functional Testing
 - b. Testing Third Party Software
 - Commercial Off The Shelf (COTS) Software
 - Advantages & Disadvantages of COTS
 - COTS Usage
 - COTS Testing
 - Vendor Supplied Software
 - c. System Testing
 - d. Alpha Testing
 - e. Beta Testing
 - f. Acceptance Testing
 - g. Installation Testing
 - Compatibility & Conversion Testing
- ### III: Regression Testing
- 1. Regression Analysis & Testing
 - a. Regression Analysis Defined
 - b. Determining Impacts & Possible Side Effects
 - c. Regression During Development
 - d. Regression for Releases Systems
 - e. Regression Testing Step 1 – Test What Changed

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- f. Regression Testing Step 2 – Test What Was Affected
- g. Regression Testing Step 3 – Execute the Regression Test Suite
- 2. Maintenance Testing
 - a. Software Maintenance
 - b. Maintenance Testing
 - c. Patching Issues
 - d. Testing Patches
 - e. Maintenance Release Testing
 - f. Testing Ported Software
- 3. Test Automation
 - Regression Test Library
- 4. Regression Test Execution

Other Software Testing Courses Include:

Software Testing & Test Management: a 5-day course designed to provide an excellent knowledge base and practical skills for anyone interested in improving Software Testing and Test Management techniques and practices in their organization

Software Structural Testing: a 2-day course consisting of chapters 1-3 from our standard Software Testing and Test Management course.

Software Functional Testing & Test Management: a 3-day course consisting of chapters 1, 4, 5 and 6 from our standard Software Testing and Test Management course.

Software Test Planning & Management: a 1-day course consisting of chapter 6 from our standard Software Testing and Test Management course.

Customized Software Testing Courses: Our software testing courses are modularized so that they can be easily customized for in-house course offerings that focus on the specific content and topics needed to meet your organization's exact training requirements. For in-house courses, class exercises can also be tailored to include actual examples from your organization in order to make the training even more relevant to your environment.

For more information about these and other course offered by The Westfall Team:

Visit our website at: www.westfallteam.com

Send an email to: lwestfall@westfallteam.com

Or call: 972-867-1172

