

Software Structural Testing

Training Course Offered by The Westfall Team

Software Structural Testing is a 2-day course designed to provide an excellent knowledge base and practical skills for anyone interested in improving Software Structural (White Box) And Integration (Grey 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 learn how to utilize various techniques for performing systematic structural testing, including decision/condition coverage, loop testing and basis path testing. Strategies for performing software and system integration testing are also covered.

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 structural testing of your software
- Integrate and test the various units and components of your software system

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: Structural (White Box) Testing

1. What is Structural Testing?
 - Structural Testing Defined
 - Strengths of Structural Testing
 - Focus of Structural Testing
 - Benefit of Structural Testing

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- Weaknesses of Structural Testing
 - The Challenge of Structural Testing
 - Structural Testing Techniques
2. Condition/Decision Testing
 - Types of Condition/Decision Testing
 - Statement Coverage
 - Decision Coverage
 - Condition Coverage
 - Condition/Decision Coverage
 - Multiple Condition Coverage
 - Exercise – Condition/Decision Testing
 3. Loop Testing
 - Testing Different Classes of Loops
 - Common Loop Defects
 - Exercise – Testing Loops
 4. Basis Path Testing
 - Independent Path Coverage
 - Step 1: Draw a Control Flow Graph
 - Step 2: Calculate Cyclomatic Complexity
 - Uses of Cyclomatic Complexity
 - Step 3: Choose a Basis Set of Paths
 - Step 4: Generate Test Cases
 - Exercise – Basis Path Testing
 5. Testing Exception Handling
- c. Basis Path Testing
 - When to Choose Bottom-Up
 - Basis Path Testing During Integration
 - Exercise - Basis Path Testing During Integration
3. System Integration
 - Hardware/Software Integration Testing
 - Data Flow Testing
 - Common Data Flow Defects

Other Software Testing Courses Include:

Software Testing and Test Management: is 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 Functional Testing: a 2-day course consisting of chapters 1, 4 and 5 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

