

Testing Concepts

Lesson 00:



Course Goals and Non Goals

Course Goals

- At the end of this program, participants gain an understanding of Verification & Validation process in project
- Participants get an understanding of different testing approaches, techniques & types
- They also learn how to create effective test cases using the different testing techniques to get a good test coverage of a software application
- Participants get an understanding of Importance of monitoring progress in testing process & different project metrics

Course Non Goals

- This course does not cover automation process of testing.





Pre-requisites

None

Intended Audience



Test Engineers, Software Engineers and Senior Software Engineers





Day Wise Schedule

Day 1

- Lesson 1: Fundamentals of Testing
- Lesson 2: Types of Testing Techniques & Test Case Design

Day 2

- Lesson 2: Types of Testing Techniques & Test Case Design (Cont.)

Day 3

- Lesson 2: Types of Testing Techniques & Test Case Design (Cont.)

Day 4

- Lesson 3: Testing throughout the Software Life Cycle
- Lesson 4: Test Management & Test Case Execution

Day 5

- Lesson 5: Testing Metrics
- Lesson 6: Tool Supporting for Testing



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Lesson 1: Fundamentals of Testing

- 1.1 Some Facts
- 1.2 Introduction to Software Testing
- 1.3 Software Testing - Definitions
- 1.4 Need of Software Testing
- 1.5 Error-Failure-Defect
- 1.6 Causes of Software Defects
- 1.7 Cost of Software Defects
- 1.8 What does Software Testing reveal
- 1.9 Importance of Software Testing
- 1.10 Importance of Testing Early in SDLC Phases
- 1.11 Testing and Quality
- 1.12 Quality Perceptions



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Lesson 1: Fundamentals of Testing

- 1.13 Seven Testing Principles
- 1.14 Economics of Testing
- 1.15 How Testing is conducted?
- 1.16 Software Testing – Then (Past)
- 1.17 Software Testing – Now (Present)
- 1.18 Scope of Software Testing
- 1.19 Factors influencing the Scope of Testing
- 1.20 Risk Based Testing
- 1.21 Project Risks
- 1.22 Product Risks
- 1.23 Need of Independent Testing
- 1.24 Activities in Fundamental Test Process



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Lesson 1: Fundamentals of Testing

- 1.25 Attributes of a good Tester
- 1.26 Psychology of Testing
- 1.27 Code of Ethics for Tester
- 1.28 FS SBU: Focus on Testing
- 1.29 Testing Roles in iTEAMS
- 1.30 Limitations of Software Testing



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Lesson 2: Types of Testing Techniques & Test Case Design

- 2.1 Verification and Validation
- 2.2 Types of Testing Techniques
- 2.3 Static & Dynamic Testing Techniques
- 2.4 Introduction to Static Testing Techniques
- 2.5 Static Testing Techniques – Defects Detected & Benefits
- 2.6 Review Process Success Criteria
- 2.7 Introduction to Dynamic Testing
- 2.8 Types of Dynamic Testing Techniques
- 2.9 White Box Test Techniques
- 2.10 Black Box Testing
- 2.11 Experienced based Testing Techniques
- 2.12 Choosing a test technique
- 2.13 Static vs. Dynamic Testing
- 2.14 A good Test Case



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Lesson 2: Types of Testing Techniques & Test Case Design

- 2.15 Test Case Lifecycle
- 2.16 Test Case Design Techniques
- 2.17 What is test data?
- 2.18 Properties of Good Test Data
- 2.19 Test Data team
- 2.20 Test data lifecycle
- 2.21 Test data in STLC -Standalone phase between Test Case Design and Test Case Execution
- 2.22 What is Positive Testing?
- 2.23 Advantages/Limitations of positive testing
- 2.24 What is negative testing?
- 2.25 Advantages/Limitations of negative testing
- 2.26 Positive & Negative test scenarios



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Lesson 2: Types of Testing Techniques & Test Case Design

- 2.27 What is Basic test?
- 2.28 Example on Basic test
- 2.29 What is Alternate test?
- 2.30 Example on Alternate test
- 2.31 Importance of writing positive, negative, basic, alternate test while designing test cases
- 2.32 Best practices for test case maintenance



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Lesson 3: Testing throughout the Software Life Cycle

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- 3.2 Introduction of SDLC and V-Model
- 3.3 SDLC and V-Model
- 3.4 Iterative Life Cycles
- 3.5 Rapid Application Development
- 3.6 Rational Unified Process (RUP) Phases
- 3.7 RUP Phases and Disciplines
- 3.8 Agile Development – Extreme Programming (XP)
- 3.9 Testing Phases
- 3.10 Introduction of Component Testing
- 3.11 Component /Unit Testing
- 3.12 Introduction of Integration testing



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Lesson 3: Testing throughout the Software Life Cycle

- 3.13 Why Integration Testing is Required?
- 3.14 Types of Integration testing
- 3.15 Top Down Integration Testing
- 3.16 Top Down Integration Testing
- 3.17 Bottom Up Integration Testing
- 3.18 Top Down vs. Bottom Up Testing
- 3.19 Introduction to System Testing
- 3.20 Types of System Testing



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Lesson 4: Test Management & Test Case Execution

- 4.1 Test Planning
- 4.2 Test Plan Contents (IEEE 829)
- 4.3 Test Planning Activities
- 4.4 Entry Criteria for Functional Testing
- 4.5 Test Case Execution - Pre-execution activities
- 4.6 Types of Test Environment
- 4.7 Before starting Execution
- 4.8 Test Case Execution
- 4.9 Exit Criteria for Functional Testing
- 4.10 Test Estimation Techniques
- 4.11 Factors affecting Test Effort
- 4.12 Independent Testing
- 4.13 Roles & Responsibilities - Working as Test Leader
- 4.14 Roles & Responsibilities - Working as a Tester



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- 5.1 Monitoring the Progress
- 5.2 Metrics of Test Progress
- 5.3 Reporting Test Status
- 5.4 Test Control
- 5.5 Configuration Management & Configuration Control
- 5.6 Products for Configuration Management in Testing
- 5.7 Definition of Metrics
- 5.8 Need of Metrics
- 5.9 Metrics for Testing
- 5.10 Types of Metrics
- 5.11 Types of Metrics – Project Metrics
- 5.12 Types of Metrics – Process Metrics
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Lesson 6: Tool Supporting for Testing

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- 6.2 Test Tools Classification
- 6.3 Tool Support for Management of Testing and Test
- 6.4 Tool support for Static Testing
- 6.5 Tool support for Test Specification
- 6.6 Tool support for Test Execution & Logging
- 6.7 Tool support for Performance & Monitoring
- 6.8 Tool support for specific Testing Needs
- 6.9 Need of Software Testing Tools
- 6.10 Potential Benefits of using Tools
- 6.11 Risks of using Tools
- 6.12 Special Considerations for some Types of Tools
- 6.13 Introducing a Tool into an Organization



References

Student material:

- Class Book (presentation slides with notes)
- Lab book

Book:

- Testing Computer Software – Cem Kaner
- Software Testing in the Real World – Edward Kit
- Effective methods for Software testing – William E. Perry
- Software Engineering -A Practitioner's Approach – Roger S. Pressman
- Software Testing Techniques – Boris Beizer

Web-site:

- <http://www.softwaretesting.org>
- <http://www.onestoptesting.com/introduction/>



Next Step Courses



Automation testing

