

Testing and Technology: ISTQB Advanced Course Outline

General Description

Adequate test designs and specifications are the key to precise test cases and an efficient and effective testing process. Mastering a variety of different testing methods will enable you to reduce time pressure on your testing efforts.

This training course presents a comprehensive palette of methods and techniques for deriving and specifying software tests based on the system's implementation and structure ("white box tests"). On completing the course, you will be able to select and apply techniques for test case derivation such as control flow or data flow testing as well as static and dynamic analysis. We'll also look at supplementary non-functional techniques such as reliability testing, usability testing, performance, load and stress testing.

Testing tools are a valuable support in larger testing environments. The course reviews various tools available on the market are reviewed and their application fields and limits are discussed. Participants will learn how to decide on whether a tool will offer useful support in their work, and how to avoid potential pitfalls in selection and implementation.

This seminar is the ideal preparation for the Technical Tester examination – part of the "ISTQB Certified Tester Advanced Level" certification. In preparation for the exam, participants are familiarized with the subject matter behind the test standard and deepen their understanding by working through tool demonstrations, case studies and exercises on the PC. It is possible to take the examination directly at the end of the seminar.

Learning Objectives

Through presentation, discussion, and hands-on exercises, attendees will learn to:

- Understand the goals, strategies, and tactics of effective and efficient testing.
- Assess and use structural techniques: control flow based
 - + Statement and branch coverage
 - + Path coverage, LCSAJ and segment-pair coverage
 - + Simple, multiple and minimal-multiple condition coverage
- Data flow-based structural techniques and coverage criteria
- Static and dynamic analysis

- Non-functional techniques
 - + Usability testing
 - + Internationalization test
 - + Performance, load and stress test
 - + Reliability testing

Session Plan

Day One

Introductions, objectives and overview

Structural testing techniques:

- Control flow based testing techniques
- Simple condition coverage
- Data flow based testing techniques

Exercise: Applying control flow based testing techniques

Exercise: Base line method

Exercise: Implementing test cases according to minimal multiple condition coverage

Exercise: Implementing test cases according to defs/uses-criteria

Exercise: Heuristic evaluation

Exercise: Preparing a usability test

Exercise: User profiles and scenarios for a load test

Day Two

Non-functional testing techniques (Part I):

- Usability tests
- Load tests
- Reliability tests

Non-functional testing techniques (Part II):

- Load tests
- Performance tests
- Reliability tests

Dynamic analysis

- General issues in dynamic analysis
- Instrumentation and tools

Exercise: Using the dynamic analysis to identify runtime errors

Day Three

Static analysis

- Syntax analysis
- Data flow analysis
- Control flow analysis

- Complexity measure
- Conventions and standards
- Tools

Exercise: Analyzing the control flow and the data flow of simple C-code

Example: Complexity measure

Example: Cyclomatic number

Selecting testing techniques

- Testing techniques and test phases
- Assessment criteria
- Standards and guidelines
- Selecting the appropriate technique for your testing task
- Problems in using tools
- Requirements for using tools
- Potential in using tools for testing

Test tool categories

- Software test and tool categories
- Tools for planing and management
- Tools for specification and design
- Tools for analysis and testing
- Other test tools

Example and exercise: Test management

Example and exercise: Fault management

Example: White box test

Example: Automated GUI test

Example: Load test

Evaluating selecting and introducing tools

- Test process maturity level
- Order during introducing tools
- Selecting a test tool
- Introducing a test tool

Glossary, bibliography, and resources

Recommended Readings and Preparation

The class materials include an extensive bibliography of books related to software testing, project management, quality, and other topics of interest to the test professional.

We recommend that the attendee has completed an ISTQB Foundation-level certification course or the equivalent prior to taking this course.