

Test Engineering Foundation Course Outline

General Description

This course provides testers, developers, test engineers, test analysts, SDETs/SETs, DevQAers, DevTesters, and test managers with the essential ideas, processes, tools, and skills they need to apply fundamental testing best practices. This hands-on course covers the major test techniques with lecture and exercises. The course provides the methodology behind a successful testing program and covers a wide range of issues, from those related to the individual tester to those related to testing across the organization. The entire testing process is presented, including the difficult tasks of tracking and presenting test results. Creation of a test environment and test automation is also covered, along with how testing works in the context of modern software development practices such as Agile, Kanban, CI/CD, Continuous Deployment, and Devops.

This course is experience-based, highly interactive, and hands-on, with a mixture of explanation of concepts, regular interactive activities centered on those concepts, case studies from over a dozen real-world projects, and hands-on exercises based on a realistic sample project. Created by Rex Black, President of RBCS, Inc. (www.rbc-us.com), past President of the International Software Testing Qualifications Board (www.istqb.org), past President of the American Software Testing Qualifications Board (www.astqb.org), Project Manager and Technical Editor for ISTQB Foundation Syllabus 2018, Chair of the Agile Working Group, and co-author of over ten other ISTQB syllabi, this course is ideal for individuals preparing for ISTQB certification. It covers the ISTQB Foundation Syllabus 2018, and was accredited by the ASTQB in August 2018.

Solutions are provided for the exercises performed in the class, along with three mock exams, over 100 sample questions covering every learning objective in the Syllabus, copies of the ISTQB Foundation Syllabus 2018 and Glossary, detailed advice on how to prepare for the exam, and more.

What Attendees Will Gain from this Course

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

- Reduce risk, find defects, build confidence, and provide information by applying testing best practices

- Promote efficient and effective communication through a common software testing vocabulary
- Use black-box, white-box, and experience-based techniques to design and execute tests based on requirements, user stories, and other information sources
- Explain the value of testing and report test results in clear, actionable ways that stakeholders understand
- Understand fundamental concepts of software testing
- Optimize testing practices, priorities, and strategies based on constraints, project objectives, and product type
- Contribute effectively in reviews
- Assist in the selection and implementation of test tools

These outcomes are accomplished by achieving the following detailed learning objectives:

- Identify the typical objectives of testing
- Differentiate testing from debugging
- Give examples of why testing is necessary
- Describe the relationship between testing and quality assurance and give examples of how testing contributes to higher quality
- Distinguish between error, defect and failure
- Distinguish between the root cause of a defect and its effects
- Explain the seven testing principles
- Explain the impact of context on the test process
- Describe the test activities and respective tasks within the test process
- Differentiate the work products that support the test process
- Explain the value of maintaining traceability between the test basis and the test work products
- Identify the psychological factors that influence the success of testing
- Explain the difference between the mindset required for testing and development activities
- Explain the relationships between software development activities and test activities in the software development lifecycle
- Identify reasons why software development lifecycle models must be adapted to the context of project and product characteristics

- Compare the different levels of testing from the perspective of objectives, test basis, test objects, approaches and responsibilities, and typical defects and failures
- Compare functional, non-functional and white-box testing, and recognize that these test types occur at all test levels
- Compare the purposes of confirmation testing and regression testing
- Summarize triggers for maintenance testing and the role of impact analysis in maintenance testing
- Explain the use of, the difference between, and the value of static and dynamic test techniques
- Recognize the different activities, roles, responsibilities, and types of reviews, and the factors that make reviews successful
- Apply a review technique to a work product to find defects
- Explain the characteristics, commonalities, and differences between black-box test techniques, white-box test techniques and experience-based test techniques
- Derive test cases using equivalence partitioning, boundary value analysis, decision tables, state transition diagrams and tables, and use case
- Explain the concept and value of statement and decision coverage
- Explain error guessing, exploratory testing, and checklist-based testing
- Explain independent testing, and the tasks of a test manager and tester
- Summarize the purpose and content of a test plan
- Differentiate between various test strategies
- Give examples of entry criteria/definitions of ready and exit criteria/definitions of done
- Apply knowledge of prioritization, technical and logical dependencies to schedule test execution for a given set of test cases
- Identify factors that influence the effort related to testing, and explain two common estimation techniques, metrics-based and expert-based
- Recall metrics used for testing
- Summarize the purposes, contents, and audiences for test reports
- Summarize how configuration management supports testing
- Define risk level by using likelihood and impact
- Distinguish between project and product risks

- Use product risk analysis to influence the priority, thoroughness, and scope of testing
- Write a defect report, covering defects found during testing
- Classify test tools according to their purpose and the test activities they support
- Identify benefits and risks of test automation
- Remember special considerations for test execution and test management tools
- Identify the main principles for selecting a tool
- Recall the objectives for using pilot projects to introduce tools
- Identify the success factors for evaluation, implementation, deployment and on-going support of test tools in an organization

Course Materials

This course includes the following materials:

<i>Name</i>	<i>Description</i>
Course Outline	A general description of the course along with learning objectives, course materials, and an outline of the course topics, including approximate timings for each section.
Noteset	A set of over 400 PowerPoint slides covering the topics to be addressed.
Optional text book	<i>Foundations of Software Testing: ISTQB Certification</i> an essential guide to software testing and the ISTQB Foundation qualification, authored by a group involved in the writing of the ISTQB Syllabus.
Sample Exam Questions	A complete set of practice questions, with one or more questions for every learning objective in the ISTQB Foundation Syllabus. Also four mock exams are included to assess your readiness for the ISTQB Foundation exam.
Project Source Documents for Course Exercises	Specifications used in the realistic example project used in exercises for the course.
Exercise Solutions	A set of approximately 100 pages of detailed solutions for all exercises in the course.
ISTQB Foundation Syllabus	The Certified Tester Foundation Level Syllabus which forms the basis for the International Software Testing Qualification at the Foundation Level.
ISTQB Glossary	The latest glossary of terms used in Software Testing produced by member of the ISTQB.

<i>Name</i>	<i>Description</i>
ISTQB Exam Structure	A description of the ISTQB Foundation 2018 exam to help attendees understand question distribution on the exam.
Information for those Pursuing Certification	Tips and advice on how to prepare for the exam.
Bibliography and resources	A set of further readings, Web sites, tools and other resources to help implement the concepts.

The course materials are provided in a mixture of hard copy and electronic format to maximize attendee convenience.

Session Plan

The course runs for four days, with two hours set aside on the fourth day for the ISTQB Foundation exam if desired. An abbreviated three day version is available, also. Each day is about 360 minutes of class time, from 9:00 to 5:00, including lunch and other breaks.

Please note that timings are approximate, depending on attendee interest and discussion. All sections include interactive activities, discussions, and exercises (some of which are optional and covered based on time available and attendee interest).

Introduction (30 minutes)

Fundamentals of Testing (230 minutes)

What is Testing?

Why is Testing Necessary?

Seven Testing Principles

Test Process

The Psychology of Testing

Testing Throughout the Software Development Lifecycle (130 minutes)

Software Development Lifecycle Models

Test Levels

Test Types

Maintenance Testing

Static Testing (140 minutes)

Static Testing Basic

Review Process

Test Techniques (360 minutes)

Categories of Test Techniques

Black-box Test Techniques

White-box Test Techniques

Experience-based Test Techniques

Test Management (325 minutes)

Test Organization
Test Planning and Estimation
Test Monitoring and Control
Configuration Management
Risks and Testing
Defect Management
Tool Support for Testing (65 minutes)
 Test tool considerations
 Effective use of tools
Question and answer period
ISTQB exam

Recommended Readings

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