

# **Certified Tester**

## **Technical Test Analyst Advanced Level Overview of Syllabus**

Version 4.0

---

International Software Testing Qualifications Board

---



### Copyright Notice

This document may be copied in its entirety, or extracts made, if the source is acknowledged.

Copyright © International Software Testing Qualifications Board (hereinafter called ISTQB<sup>®</sup>).

This document was formally released by the General Assembly of the ISTQB<sup>®</sup> on June 30, 2021

## Revision History

Version	Date	Remarks
V4.0	February 26, 2021	Updated to only cover TTA for v4.0 syllabus
2019 V1.1	December 19, 2019	Launch version Minor typographical corrections Remove reference to release notes Course durations stated in hours (section 0.7)
2019 V1.0	October 18, 2019	GA release for 2019 version
2019 Beta	July 22, 2019	Beta 2019 review version

## Acknowledgements

A previous version of this document was produced for the v2019 TA and TTA syllabi by a core team from the International Software Testing Qualifications Board Advanced Level Working Group: Graham Bath, Judy McKay, Mike Smith

This core team thanked the review team and the National Boards for their suggestions and input.

The following persons participated in the reviewing, commenting, and balloting of this document:

Laura Albert  
Markus Beck  
Ágota Horváth  
Dietrich Leimsner  
Gary Mogyorodi  
Ingvar Nordström  
Benjamin Timmermans  
Jan Versmissen  
Robert Werkhoven  
Zhou Chuanhuan

This version of the document for TTA v4.0 was produced by Stuart Reid, Christian Graf, Adam Roman and Armin Born.

## Table of Contents

Revision History .....	3
Acknowledgements .....	4
Table of Contents .....	5
0. Introduction to the Advanced Level .....	6
0.1 The Advanced Level TTA Version 4.0 .....	6
0.2 Career Paths for Testers .....	6
0.3 Intended Audience .....	6
0.4 Learning Objectives .....	6
0.5 Entry Requirements .....	7
0.6 Exam Structure .....	7
0.7 Course Duration .....	7
0.8 Handling of Standards .....	7
1. The Advanced Level Technical Test Analyst Syllabus .....	8
1.1 Structure and Course Duration .....	8
1.2 Business Outcomes .....	8
1.3 Content .....	9
1.4 Further Development Opportunities .....	9
1.5 Business Outcomes Traceability Matrix with Learning Objectives .....	10
1.6 Main Changes in Version 4.0 of the Syllabus .....	12
2. References .....	13
2.1 ISTQB <sup>®</sup> Documents .....	13

## 0. Introduction to the Advanced Level

This overview document is intended for anyone with an interest in the ISTQB<sup>®</sup> Advanced Level who wants a high-level introduction to its leading principles and an overview of the Technical Test Analyst (TTA) Advanced Level Syllabus.

In this document the TTA module is described in summary form and the business outcomes are stated. These provide a specific statement of what can be expected from a person who achieves the TTA Advanced Level Certification, and will particularly benefit companies that are considering the development of specific skills at this level.

### 0.1 The Advanced Level TTA Version 4.0

In general, the changes introduced in version 4.0 of the Advanced Level Technical Test Analyst syllabus result from feedback from use of the previous 2019 version of the syllabus.

For stakeholders who are already familiar with or use the 2019 version of the Advanced Level TTA Syllabus, a summary of the main changes is provided in section 1.6.

A separate release note provides a comparison between the learning objectives in the 2019 version and version 4.0 and shows which business outcomes and learning objectives have been added, updated, or removed.

### 0.2 Career Paths for Testers

The ISTQB<sup>®</sup> scheme provides support for the definition of career paths in testing by offering a 3-tiered certification scheme starting with the Foundation Level and continuing with the Advanced Level and Expert Level. These are supported by a collection of Specialist Level and Agile modules which enable additional specialist skills to be developed in certain subjects (e.g., performance testing).

The Advanced Level builds on the Foundation Level and establishes a platform from which further skills and knowledge may be acquired at Expert level.

Please visit [www.istqb.org](http://www.istqb.org) for the latest overview of ISTQB's career paths.

### 0.3 Intended Audience

The Advanced Level Technical Test Analyst qualification is suitable for anyone who is involved in testing as well as anyone interested in further developing their software testing knowledge. This includes people performing activities such as test analysis, test consulting and software development.

The syllabus provides testing knowledge for anyone working with Agile or sequential software development lifecycles.

### 0.4 Learning Objectives

The knowledge levels of the specific learning objectives at K2, K3 and K4 levels are shown at the beginning of each chapter and are classified as follows:

- K2: Understand
- K3: Apply
- K4: Analyze

The definitions of all terms listed as keywords just below the chapter headings shall be remembered (K1), even if not explicitly mentioned in the learning objectives.

## 0.5 Entry Requirements

The entry criterion for taking the Advanced Level Technical Test Analyst exam is that candidates have acquired the ISTQB<sup>®</sup> Certified Tester Foundation Level certification [CTL\_SYL].

## 0.6 Exam Structure

The Advanced Level Technical Test Analyst exam structure is defined in the document “Certified Tester Advanced Level Syllabus Exam Structure and Rules Technical Test Analyst Version 4.0”, which can be found on [www.istqb.org](http://www.istqb.org).

The TTA Advanced Level module has the following attributes:

- The format of the exam is multiple choice.
- Exam duration is 120 minutes. If the candidate’s native language is not the examination language, the candidate is allowed an additional 25% (exam duration = 150 minutes).
- There are 45 questions.
- To pass the exam, at least 65% of the total sum of points must be answered correctly.
- The total number of points for this exam should be set at 78 points. Therefore, a minimum of 51 points is required to achieve a passing score.

Exams may be taken as part of an accredited training course or taken independently (e.g., at an exam center or in a public exam). Completion of an accredited training course is not a pre-requisite for the exam.

## 0.7 Course Duration

For accredited training courses, a minimum of 20 hours of instruction time is required.

Individual training times for each chapter are provided in section 1.1.

## 0.8 Handling of Standards

There are standards referenced in the Advanced Level TTA syllabus (e.g., ISO, IEC). The purpose of these references is to provide a framework (as in the references to ISO 25010 regarding quality characteristics) or to provide a source of additional information if desired by the reader. Please note that the syllabus uses the standards as a reference. The standards are not intended for examination.

# 1. The Advanced Level Technical Test Analyst Syllabus

## 1.1 Structure and Course Duration

The Advanced Level Technical Test Analyst syllabus contains six chapters covering the knowledge necessary to be a technical test analyst.

The top-level heading for each chapter specifies the minimum time for the chapter; timing is not provided below chapter level. For accredited training courses, the syllabus requires a minimum of 20 hours of instruction, distributed across the six chapters as follows:

- Chapter 1: The Technical Test Analyst's Tasks in Risk-Based Testing (30 minutes)
- Chapter 2: White-Box Test Techniques (300 minutes)
- Chapter 3: Static and Dynamic Analysis (180 minutes)
- Chapter 4: Quality Characteristics for Technical Testing (345 minutes)
- Chapter 5: Reviews (165 minutes)
- Chapter 6: Test Tools & Automation (180 minutes)

## 1.2 Business Outcomes

This section lists the Business Outcomes expected of a candidate who has achieved the Advanced Level Technical Test Analyst certification.

An Advanced Level Technical Test Analyst can:

TTA1	Recognize and classify the typical risks associated with the performance, security, reliability, portability and maintainability of software systems.
TTA2	Provide technical elements to the planning, design and execution of tests for mitigating performance, security, reliability, portability and maintainability risks.
TTA3	Select and apply appropriate white-box test techniques to ensure that tests provide an adequate level of confidence, based on design coverage.
TTA4	Effectively participate in reviews with developers and software architects applying knowledge of typical defects in the code and architecture.
TTA5	Improve the quality characteristics of code and architecture by making use of different analysis techniques
TTA6	Outline the costs and benefits to be expected from introducing particular types of test automation.
TTA7	Select appropriate tools to automate technical testing tasks.
TTA8	Understand the technical issues and concepts in applying test automation.



## 1.3 Content

### Chapter 1: The Technical Test Analyst's Tasks in Risk-Based Testing

- Risk Identification
- Risk Assessment
- Risk Mitigation

### Chapter 2: White-Box Test Techniques

- White-Box Test Techniques
- Selecting a White-Box Test Technique

### Chapter 3: Static and Dynamic Analysis

- Static Analysis
- Dynamic Analysis

### Chapter 4: Quality Characteristics for Technical Testing

- General Planning Issues
- Security Testing
- Reliability Testing
- Performance Testing
- Maintainability Testing
- Portability Testing
- Compatibility Testing
- Operational Profiles

### Chapter 5: Reviews

- Technical Test Analyst Tasks in Reviews
- Using Checklists in Reviews

### Chapter 6: Test Tools & Automation

- Defining the Test Automation Project
- Specific Test Tools

## 1.4 Further Development Opportunities

The knowledge acquired from the Technical Test Analyst may be further developed by the following ISTQB® Specialist Level modules:

### ISTQB® Specialist Level:

- Performance Testing [CT\_PT\_SYL]
- Security Testing [CT\_SEC\_SYL]
- Mobile Application Testing [CT\_MAT\_SYL]
- Test Automation Engineering [CT\_TAE\_SYL]
- Model-Based Tester [CT\_MBT\_SYL]

The ISTQB® Certified Tester Foundation Level Certificate is required before taking the exams for these modules. Please visit [www.istqb.org](http://www.istqb.org) for the latest overview of ISTQB's modules.

## 1.5 Business Outcomes Traceability Matrix with Learning Objectives

The following tables show information about Learning Objectives and their coverage of the Business objectives. The tables contain the following information:

- Section of syllabus (number and title)
- LO number
- K-Level
- Description of LO
- Mapping of LO to Business Objectives.

			Mapping to TTA Business Objectives							
			TTA1	TTA2	TTA3	TTA4	TTA5	TTA6	TTA7	TTA8
<b>1. The Technical Test Analyst's Tasks in Risk-Based Testing</b>										
<b>1.3 Risk Assessment</b>										
TTA-1.2.1	2	Summarize the generic risk factors that the Technical Test Analyst typically needs to consider	1							
TTA-1.2.2	2	Summarize the activities of the Technical Test Analyst within a risk-based approach for testing activities	1							
<b>2. White-box Test Techniques</b>										
<b>2.2 Statement Testing</b>										
TTA 2.2.1	3	Design test cases for a given test object by applying statement testing to achieve a defined level of coverage.			1					
<b>2.3 Decision Testing</b>										
TTA 2.3.1	3	Design test cases for a given test object by applying the Decision test technique to achieve a defined level of coverage.			1					
<b>2.4 Modified Condition/Decision Testing</b>										
TTA 2.4.1	3	Design test cases for a given test object by applying the modified condition/decision test technique to achieve full modified condition/decision coverage (MC/DC)			1					
<b>2.5 Multiple Condition Testing</b>										
TTA 2.5.1	3	Design test cases for a given test object by applying the multiple condition test technique to achieve a defined level of coverage			1					
<b>2.7 API Testing</b>										
TTA 2.7.1	2	Understand the applicability of API testing and the kinds of defects it finds			1					
<b>2.8 Selecting a White-Box Test Technique</b>										
TTA 2.8.1	4	Select an appropriate white-box test technique according to a given project situation.			1					
<b>3. Static and Dynamic Analysis</b>										
<b>3.2 Static Analysis</b>										
TTA-3.2.1	3	Use control flow analysis to detect if code has any control flow anomalies and to measure cyclomatic complexity					1			
TTA-3.2.2	3	Use data flow analysis to detect if code has any data flow anomalies					1			
TTA-3.2.3	3	Propose ways to improve the maintainability of code by applying static analysis					1			
<b>3.3 Dynamic Analysis</b>										
TTA-3.3.1	3	Apply dynamic analysis to achieve a specified goal					1			

(continued)

			Mapping to TTA Business Objectives							
			TTA1	TTA2	TTA3	TTA4	TTA5	TTA6	TTA7	TTA8
<b>4 Quality Characteristics for Technical Testing</b>										
<b>4.2 General Planning Issues</b>										
TTA-4.2.1	4	For a particular scenario, analyze the non-functional requirements and write the respective sections of the test plan	1							
TTA-4.2.2	3	Given a particular product risk, define the particular non-functional test type(s) which are most appropriate	1							
TTA-4.2.3	2	Understand and explain the stages in an application's software development lifecycle where non-functional testing should typically be applied	1	1						
TTA-4.2.4	3	For a given scenario, define the types of defects you would expect to find by using non-functional test types	1	1						
<b>4.3 Security Testing</b>										
TTA-4.3.1	2	Explain the reasons for including security testing in a test approach		1						
TTA-4.3.2	2	Explain the principal aspects to be considered in planning and specifying security tests		1						
<b>4.4 Reliability Testing</b>										
TTA-4.4.1	2	Explain the reasons for including reliability testing in a test approach		1						
TTA-4.4.2	2	Explain the principal aspects to be considered in planning and specifying reliability tests		1						
<b>4.5 Performance Testing</b>										
TTA-4.5.1	2	Explain the reasons for including performance testing in a test approach		1						
TTA-4.5.2	2	Explain the principal aspects to be considered in planning and specifying performance testing		1						
<b>4.6 Maintainability Testing</b>										
TTA-4.6.1	2	Explain the reasons for including maintainability testing in a test approach		1						
<b>4.7 Portability Testing</b>										
TTA-4.7.1	2	Explain the reasons for including portability tests in a testing strategy and/or test approach		1						
<b>4.8 Compatability Testing</b>										
TTA-4.8.1	2	Explain the reasons for including co-existence testing in a test approach		1						
<b>5. Reviews</b>										
<b>5.1 Introduction</b>										
TTA-5.1.1	2	Explain why review preparation is important for the Technical Test Analyst				1				
<b>5.2 Using Checklists in Reviews</b>										
TTA-5.2.1	4	Analyze an architectural design and identify problems according to a checklist provided in the syllabus				1				
TTA-5.2.2	4	Analyze a section of code or pseudo-code and identify problems according to a checklist provided in the syllabus				1				
<b>6. Test Tools &amp; Automation</b>										
<b>6.1 Defining the Test Automation Project</b>										
TTA-6.1.1	2	Summarize the activities that the Technical Test Analyst performs when setting up a test automation project								1
TTA-6.1.2	2	Summarize the differences between data-driven and keyword-driven automation						1		1
TTA-6.1.3	2	Summarize common technical issues that cause automation projects to fail to achieve the planned return on investment								1
TTA-6.1.4	3	Construct keywords based on a given business process								1
<b>6.2 Specific Test Tools</b>										
TTA-6.2.1	2	Summarize the purpose of tools for fault seeding and fault injection						1		
TTA-6.2.2	2	Summarize the main characteristics and implementation issues for performance testing tools						1		1
TTA-6.2.3	2	Explain the general purpose of tools used for web-based testing						1	1	
TTA-6.2.4	2	Explain how tools support the practice of model-based testing						1	1	
TTA-6.2.5	2	Outline the purpose of tools used to support component testing and the build process						1	1	
TTA-6.2.6	2	Outline the purpose of tools used to support mobile application testing						1	1	

## 1.6 Main Changes in Version 4.0 of the Syllabus

The following principal changes have been made to the 2019 Technical Test Analyst syllabus:

Subject/Chapter	Description of Change
White-Box Test Techniques Chapter 2	Technique removed: Basis Path Testing.
Analytical Techniques Chapter 3	Cyclomatic complexity explicitly added to K3 Control Flow Analysis LO. Data Flow Analysis moved from K2 to K3. K2 LO on Call Graphs for Integration Testing removed.
Quality Characteristics Chapter 4	Reliability Testing and Performance Efficiency Testing sections updated, and Operational Profiles explicitly covered in a separate section.

## 2. References

### 2.1 ISTQB<sup>®</sup> Documents

ID	Document name
[CTFL_SYL]	Foundation Level Syllabus, Version 3.1 (2018)
[CT_PT_SYL]	Performance Testing Syllabus
[CT_SEC_SYL]	Security Testing Syllabus
[CT_MAT_SYL]	Mobile Application Testing Syllabus
[CT_TAE_SYL]	Test Automation Engineering Syllabus
[CT_MBT_SYL]	Model-Based Tester Syllabus