

Education-Based Test Certifications

Issued by:

International Institute for Software Testing

- ✓ **Certified Software Test Professional – Associate Level (CSTP-A)**
- ✓ **Certified Software Test Professional – Practitioner Level (CSTP-P)**
- ✓ **Certified Software Test Professional – Master Level (CSTP-M)**
- ✓ **Certified Test Manager (CTM)**
- ✓ **Certified Software Test Automation Specialist (CSTAS)**
- ✓ **Certified Software Quality Manager (CSQM)**

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Get EDUCATED**

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International Institute for Software Testing

Promoting Disciplined Software Testing Practices

*Develop your Career Through
Education-Based Certifications*

Background

Testing software systems to verify they perform reliably and as expected is a very critical quality control activity. Unfortunately, this critical activity is being performed on almost every software project in a very ad hoc, informal manner by developers, testers, and users. Informal surveys conducted by the International Institute for Software Testing indicate that less than 1% of test professionals attending these seminars have used formal test design techniques to design their tests. Formal academic programs seldom provide even rudimentary coverage of software testing, let alone teaching it as a discipline.

Testing activities in many software projects are rarely planned and test teams are unable to perform adequate testing. Software testers have been given very little training and guidance on how to perform effective testing.

Testing is a Disciplined Controlled Process

The complexity of software systems and the demand of customers and users are increasing every day. With the current state of practice and lack of educated test teams, test professionals often are unable to perform adequate testing of software systems that control different aspects of our lives. It has become evident that testing must be treated as a disciplined and controlled process. Test professionals must learn precise techniques and methods by which they can deliver software with a much higher degree of confidence. Testing must become a recognized profession and discipline that must be learned. Individuals who are charged with the responsibility of testing computer systems must receive formal education and must be recognized by their peers in the software industry. Bodies of Knowledge must be carefully defined to cover areas that must be mastered by test professionals.

Education is the Only Way to Establish Testing as a Profession and Discipline

One of the most effective ways to establish a profession is establishing formal educational programs that cover all areas of study that can serve the profession. An essential first step to developing educational programs is to develop Bodies of Knowledge (BOK) that must be mastered by everyone who wishes to belong to the profession. Educating testers on curriculum that is based on a well-established BOK is the only way to establish testing as a discipline and to change the perception that testing is an ad hoc activity that requires minimal training.

To fill this gap, the International Institute of Software Testing (IIST) has taken the lead since 1999 and has become the only provider of education-based certifications. IIST's Advisory Board, a group of industry experts and practitioners, provides direction to the effort of developing education-based certifications. The IIST Advisory Board strongly believes that the value of any certification program lies in its ability to meet individuals' diverse needs and interests for both breadth and depth of content, enabling them to improve the way they perform their jobs more effectively on a day-to-day basis.

Education-Based Certifications

To achieve this goal of education-based certifications, IIST now offers six education-based certifications. Each certification is based on a well-defined Body of Knowledge (BOK) approved by IIST's Advisory Board. To achieve these certifications, a candidate must attend a number of instructor-lead courses and pass a test for each course. Tests in Education-Based Certifications are not multiple choice or true/false type of tests. The Advisory Board agreed that such a model is vastly superior to certifications that are based on passing an exam and do not require a rigorous course of study.

How to Evaluate the Value of Certification

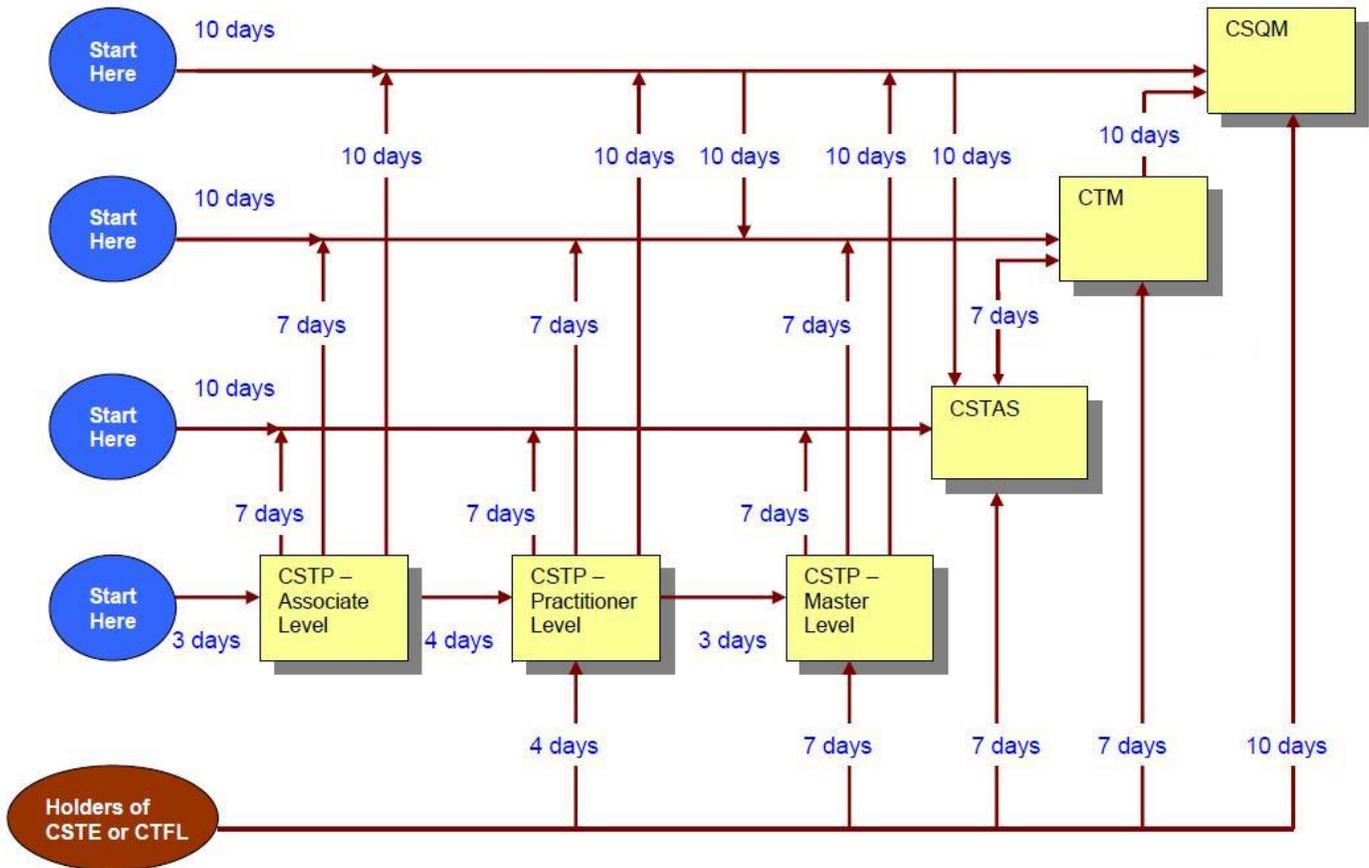
When selecting a certification to pursue, ask the following essential question:

- Will the certification make me a better test professional?
- How comprehensive and broad is the Body of Knowledge?
- How much will I learn in the process of getting certified and how would help me do a better job?

- Is the program based on providing substantial coverage of each of the areas of a Body of Knowledge?
- How flexible is the Body of Knowledge? Can students choose from among a variety of instructors and courses satisfying each of the Body of Knowledge education requirements?

Developing your Testing and QA Career Through Education-Based Certifications

The chart below depicts what the International Institute for Software Testing recommends as possible career path for individuals involved in software testing and quality management. Other paths are also possible based on individual's specific professional development goals.



Certified Software Test Professional – Associate Level (CSTP-A)

Objectives of CSTP – Associate Level Certification

- Help individuals gain a better understanding of the test terminology and concepts
- Help improve communication among members of the test team
- Provide test professionals with techniques to work with incomplete requirements
- Help test professionals to have a better understanding of the test process
- Help test professionals to be able to test even with no requirement or with poor requirements
- Teach test professionals how to break down requirements to scenarios for better testing
- Help test professionals to be able to perform more effective regression testing
- Teach test professionals a systematic process for both positive and negative testing
- Teach test professionals better ways to document their test design
- Help test professionals gain a better understanding of the different levels of testing
- Help test professional collaborate with developers to close the gap between requirements and code to have better test coverage
- Help test professionals track test execution progress

Who Should Pursue the CSTP – Associate Level Certification?

- Anyone new to the testing area. This includes individual in roles such as testers, test analysts, developers, test engineers, test consultants, user acceptance testers, and test managers.
- Experienced testers using ad hoc methods and informal ways to test
- Individuals whose test experience is narrowly focused (does not have a life cycle view)
- Anyone who wishes to become a better test professional or advance his/her professional standing in testing
- Anyone who wants a basic understanding of software testing, such as project managers, quality managers, software development managers, business analysts, and IT directors.

CSTP – Associate Level Certification Requirements

Formal Education Requirements

Three days of training that cover areas 1 & 2 of the Test Professional Body of Knowledge (TPBOK).

Written Exam:

Candidates are required to complete a written exam for each course and pass with a level of performance no less than 80%. For courses conducted by IIST, a candidate is allowed to retake the exam for a second time without having to attend the course again. There is a \$100 fee for retakes. If 80% performance is not achieved on a second attempt, the candidate must retake the course or take another course covering the same BOK area.

Job Experience Requirements: None

CSTP - Associate Level Re-Certification Requirements

The CSTP - Associate Level Certification will expire 3 years after it is granted. As a result, all CSTP – A Certified participants must complete the recertification requirements before that time. The re-certification requirements are three days of training to cover any topic in software testing within three years. Days of training may be used to satisfy the requirements of a higher level certification. All training requires attending an exam in each course and achieving 80% performance.

Certified Software Test Professional – Practitioner Level (CSTP-P)

Objectives of CSTP – Practitioner Level Certification

In addition to achieving all objectives listed under CSTP – Associate Level, CSTP – Practitioner Level aims at achieving the following objectives:

- Help test professionals analysis and evaluate requirements for testability and design tests based on requirements
- Help test professionals manage the different aspects of the test process
- Provide test professionals with ways to measure and control the testing process
- Help test professionals have better control over the test execution process
- Provide test professionals with best practices in bug reporting
- Help test professionals define testing activities as appropriate for the life cycle model utilized
- Help test professionals perform better test plans

Who Should Pursue the CSTP – Practitioner Level Certification?

- Individuals who hold an active - CSTP Associate Level Certification
- Individuals who hold an active CTFL or CSTE Certifications

CSTP – Practitioner Level Certification Requirements

Formal Education Requirements

1. Completion of CSTP-Associate Level Educational Requirements or an active CFTL or CSTE certification
2. Four days of training as follows:
 - a. Three days of training to cover Area #3 (Managing the Test Process), #4 (Test Execution), and #5 (Requirement Analysis and Requirement-Based Testing) of the Test Professionals Body of Knowledge.
 - b. One day elective, that may cover any of the above areas or other supporting areas.

Written Exam:

Candidates are required to complete a written exam for each course and pass with a level of performance no less than 80%. For courses conducted by IIST, a candidate is allowed to retake the exam for a second time without having to attend the course again. There is a \$100 fee for retakes. If 80% performance is not achieved on a second attempt, the candidate must retake the course or take another course covering the same BOK area.

Job Experience Requirements: At least one year in a software testing-related job. This requirement shall be met by means of a letter of support signed by the candidate's supervisor describing the candidate's specific role and responsibilities over a period of one year or more.

CSTP - Practitioner Level Re-Certification Requirements

The CSTP - Practitioner Level Certification will expire 3 years after it is granted. As a result, all CSTP - P Certified participants must complete the recertification requirements before that time. The re-certification requirements are three days of training to cover any topic in software testing within three years. Days of training may be used to satisfy the requirements of a higher level certification. All training requires attending an exam in each course and achieving 80% performance.

Certified Software Test Professional – Master Level (CSTP-M)

Objectives of CSTP – Master Level Certification

In addition to achieving all objectives listed under CSTP – Associate Level and CSTP – Practitioner Level, CSTP – Master Level aims at achieving the following objectives:

- Help test professionals develop their software testing skills through formal education
- Establish a common skill set for software testing professionals according to a well-defined Body of Knowledge
- Create a pool of qualified software test professionals
- Prepare candidates for a wider range of software testing assignments
- Complement company in-house and on-the-job training programs
- Provide professional recognition and career enhancement

Benefits of CSTP – Master Level Certification

- Demonstrate a level of competence in software testing methodologies and techniques
- Helps individuals develop their software testing skills through formal education
- Individuals develop common methodologies, practical approaches and skill sets based on a well-defined Body of Knowledge
- Establishes disciplined and repeatable processes for a company with a team of CSTP – Master Level holders
- Prepares candidates for a wider range of software testing assignments
- Provides professional recognition and helps gain greater acceptance of software testing as a profession
- CSTP - Master Level holders are better prepared to advance toward increased responsibility or management
- CSTP - Master Level holders are proven to be more marketable and respected in the field

Who Should Pursue Certification?

- Anyone new to the testing area
- Experienced testers using ad hoc methods
- Individuals whose test experience is narrowly focused (do not have a lifecycle view)
- Anyone who wishes to become a better test professional or advance his/her professional standing in testing

CSTP – Master Level Requirements

Two requirements must be satisfied before the CSTP-M certification can be granted. These are the Formal Education Requirement and Job Experience Requirement

Formal Education Requirements

Option #1: Achieving CSTP – Master Level as a progression from CSTP – Practitioner Level

1. Satisfying educational requirements of both CSTP – Associate Level & CSTP Practitioner Level.
2. Three days of training as follows:
 - a. Two days to cover areas #6 (Test Automation) and #7 (Static Testing) of the Test Professionals Body of Knowledge.
 - b. One day elective, which may cover any of the above areas or other test-related areas?

Option #2: Achieving CSTP Master Level without achieving CSTP – Practitioner Level. If you have already worked toward CSTP, this is the option you would use.

Ten days of training, of which at least seven days that cover all seven areas of the Test Professional Body of Knowledge. The remaining of the ten days can be selected by the candidate the cover any topic on software testing.

Written Exam:

Candidates are required to complete a written exam for each course and pass with a level of performance no less than 80%. For courses conducted by IIST, a candidate is allowed to retake the exam for a second time without having to attend the course again. There is a \$100 fee for retakes. If 80% performance is not achieved on a second attempt, the candidate must retake the course or take another course covering the same BOK area.

Transfer of Credit (Available only for Option #2 above)

Non-IIST delivered courses may be considered for a maximum of two days towards the certification upon approval of IIST's Chairperson. Candidates must submit evidence of successful completion from a recognized training institution along with detailed course material for evaluation and a certificate of completion. Materials must be accompanied by a fee of \$25.00 for each course to be evaluated.

Job Experience Requirements: At least one year in a software testing-related job. This one year is more and beyond the one year required for the CSTP – Practitioner Level if Option #1 is pursued. This requirement shall be met by means of a letter of support signed by the candidate's supervisor describing the candidate's specific role and responsibilities over a period of one year or more.

Graduation

Upon satisfying both formal education and job experience requirements, a candidate shall submit an application to the IIST Chairperson for the certification to be granted. Application forms can be obtained by contacting the IIST office. The application must be accompanied by payment of the \$120 non- refundable graduation fee. This fee covers the cost associated with record-keeping, grading exams, and certification plaque.

CSTP – Master Level Re-Certification Requirements

The CSTP - Master Level Certification will expire 3 years after it is granted. As a result, all CSTP - Master Level Certified participants must complete the recertification requirements before that time.

Rationale

Based on the objectives of the CSTP Certification, and in response to the demands imposed on test professionals to handle a wide range of responsibilities using different development environments and technologies, re-certification through continuous education has become necessary. This necessity has also been confirmed by CSTP graduates who continuously inquire about a mechanism by which they can further develop skills in more advanced and specialized areas of software testing. In response to this need, the IIST Advisory Board has approved the requirements for re-certification as outlined below.

Formal Education Requirements

An applicant for the re-certification shall complete a total of 10 educational units as described in the table below.

An applicant must complete at least 4 units from Category A. The remaining units can be completed from Categories B or C. However, the 10 units must not include more than 6 units from Category B or more than 4 units from Category C.

Category A: Minimum 4 units and up to 10 units	Category B: Maximum 6 units with no minimum	Category C: Maximum 4 units with no minimum
<ul style="list-style-type: none"> • Classroom courses with written exams. • On-line courses administered by IIST. • Courses are at the discretion of the applicant, but must be relevant to the Test Professional role and are subject to approval by IIST. • Each day counts as one unit. • College level courses on software testing or quality topics taken for credits will count as one unit for each one quarter or semester credit hour. • Applicants must submit evidence of successful completion of the course and passing the exam. 	<ul style="list-style-type: none"> • Classroom courses with no exam required. • Courses are at the discretion of the applicant, but must be relevant to the Test Professional role and are subject to approval by IIST. • Course topics are up to the applicant's choice, but must be in software testing or software engineering. • Each day counts as one unit. • Applicants must submit evidence of successful completion of the course 	Professional development activities that fall into one of the following activities: <ul style="list-style-type: none"> • Presentations at professional conferences; each presentation counts for 2 units • Publications in professional journal, magazines, or electronic forums; each publication counts for 2 units • Attending conferences; each day counts as 1/2 unit • Web-based courses requiring an exam; each course regardless of length counts as 1/2 unit

The following table shows some examples of number of units from each category to complete the re-certification requirements. Activities that qualify for each of the categories are described above. In order to count toward re-certification units, activities must be performed during the re-certification period. Evaluation of all activities will be at the discretion of the IIST Chairman. An applicant for re-certification may submit non-IIST courses to be evaluated for credits. An applicant must submit evidence of successful course material for evaluation. The fee for this evaluation is \$25 per course.

Job Experience Requirements

An applicant shall provide evidence that he or she has continued performing job responsibilities in software testing or related areas. This requirement may be satisfied through a letter from the applicant's manager describing the specific activities performed over the specified period of time.

Application

An applicant for re-certification shall submit the CSTP re-certification Application to the Chairman of IIST accompanied by evidence of completing both the educational and experience requirements and \$180 processing fee no later than 60 days before the date the certification expires. The CSTP Re-Certification Application form can be downloaded from our web site at <http://www.iist.org/certification.php>.

Category A:	Category B:	Category C:
4	2	4
6	2	2
5	5	0
4	6	0
10	0	0
8	0	2

The CSTP – Master Level Body of Knowledge

1. Principles of Software Testing <ul style="list-style-type: none"> ☉ Levels of Testing ☉ Testing Internet and web applications ☉ Testing embedded systems 	<ul style="list-style-type: none"> ☉ Testing client/server applications ☉ Testing object-oriented applications ☉ The testing life cycle
2. Test Design <ul style="list-style-type: none"> ☉ Code-based test case design techniques ☉ Test design specification 	<ul style="list-style-type: none"> ☉ Requirement-based test case design techniques

3. Managing the Testing Process	
⊙ Planning	⊙ Scheduling
⊙ Reporting	⊙ Resources
⊙ Risk Management	⊙ Measuring and improving the test process
4. Test Executions and Defect Tracking	
⊙ Test scripting	⊙ Report
⊙ Defect tracking	
5. Requirement Definitions, Refinement and Verification	
⊙ Writing testable requirement	⊙ Exploring requirements
⊙ Refining requirements	⊙ Defining requirements
⊙ Requirement verification	⊙ Requirement traceability
6. Test Automation	
⊙ Tool evaluation and selection	⊙ Architectures
⊙ Automation standards and guidelines	⊙ Planning the test automation process
⊙ Automation team roles	
7. Static Testing (Inspections, Reviews, and Walkthroughs)	
⊙ Types of static testing	⊙ The process of static testing
⊙ Defect data analysis	⊙ Improving the process

Certified Test Manager (CTM)

Objectives of the Certified Test Manager Certification

The CTM Certification was developed based on the Test Management Body of Knowledge (TMBOK) to fill the gap in the management skills required by test managers and test leads to effectively manage the test process, the test project and the test organization. Specifically, CTM aims at the following objectives:

- Help individuals develop their test management skills through formal education
- Establish a common skill set for software test managers and test leads based on a well-defined Test Management Body of Knowledge (TMBOK)
- Create a pool of qualified software test managers
- Prepare test professionals, especially those who achieved the Certified Software Test Professional - Master Level Certification, for management and lead positions in software testing projects
- Provide professional recognition and career enhancement for those who manage test projects

Who Should Pursue the CTM Certification?

- Any person who has worked in software testing for at least 3 years
- People with a management or leadership role in testing
- Development managers and development leads who wish to move to a test management or lead position
- Auditors, inspectors, and others who must evaluate the work product of the testing process
- Individuals who successfully completed CSTP – Master Level.

The CTM Certification Requirements

Two requirements must be satisfied before the CTM certification can be granted. These are the Formal Education Requirement and Job Experience Requirement

Formal Education Requirements

Ten days of training as follows:

1. Seven days to cover the seven areas of the Test Management Body of Knowledge (TMBOK)
2. Three days elective to cover any testing-related or quality-related area. Elective training may also be selected to cover any of the TMBOK in more depth.

Written Exam:

Candidates are required to complete a written exam for each course and pass with a level of performance no less than 80%. For courses conducted by IIST, a candidate is allowed to retake the exam for a second time without having to attend the course again. There is a \$100 fee for retakes. If 80% performance is not achieved on a second attempt, the candidate must retake the course or take another course covering the same BOK area.

Transfer of Credit

A CTM candidate may receive credit for attending courses by providers outside the CTM program for credit towards the CTM certification under any of the following conditions:

1. A CTM candidate who has been awarded the Certified Software Test Professional (CSTP) designation may receive a credit for THREE days as elective training towards the CTM certification.
2. A CTM candidate who has been awarded the Project Management Professional (PMP) certification may receive a credit for TWO days as elective training towards the CTM certification.
3. A CTM candidate may receive credit for courses attended by providers other than IIST for a maximum of TWO days as elective training towards the CTM certification. Candidates must submit evidence of successful completion from a recognized training institution along with detailed course material for evaluation and a certificate of completion. Materials must be accompanied by a fee of \$25.00 for each course to be evaluated.

Transfer credit is subject to the following rules:

1. A CTM candidate is allowed to transfer credit only based on one of the three conditions listed above.
2. The maximum number of training days transferable is three days
3. Transfer credits can be used only to satisfy elective training and may not be used to satisfy any Body of Knowledge area.

Job Experience Requirements

In order for the CTM certification to be granted, a candidate must have a total of at least three years working in test projects, including 1 year in a lead or management position in areas relevant to testing. This requirement must be completed by the time CTM is granted. This requirement shall be met by means of a letter of support describing the candidate's specific role and responsibilities over a period of three years or more. The letter must be authored and signed by any of the following:

1. The candidate's current or former supervisor/manager
2. The candidate's client or customer (if self-employed)
3. A co-worker currently holding a CTM certification who has worked with the candidate on a testing project.
4. Multiple sources may be submitted to cover the three-year period. Any variation from this requirement must be reviewed and approved by the IIST Chairperson.

Graduation

Upon satisfying both formal education and job experience requirements, a candidate shall submit an application to the IIST Chairperson for the certification to be granted. Application forms can be obtained by contacting the IIST office. The application must be accompanied by payment of the \$120 non-refundable graduation fee. This fee covers the cost associated with record-keeping, grading exams, and certification plaque.

CTM Re-Certification

Rationale

Based on the objectives of the CTM Certification and in response to the demands imposed on test professionals to handle a wide range of responsibilities using different development environments and technologies, re-certification through continuous education has become necessary. This necessity has also been confirmed by CTM graduates who continuously inquire about a mechanism by which they can further develop skills in more advanced and specialized areas of software testing. In response to this need, the IIST Advisory Board has approved the requirements for re-certification as outlined below.

Formal Education Requirements

CTM Certification will expire 3 years after it is granted. As a result, all CTM holders must complete the re-certification requirements before that time. An applicant for the re-certification shall complete a total of 10 educational units as described in the table below. An applicant must complete at least 4 units from Category A. The remaining units can be completed from Categories B or C. However, the 10 units must not include more than 6 units from Category B or more than 4 units from Category C.

Category A: Minimum 4 units and up to 10 units	Category B: Maximum 6 units with no minimum	Category C: Maximum 4 units with no minimum
<ul style="list-style-type: none"> Classroom courses with written exams. On-line courses administered by IIST. Courses are at the discretion of the applicant but must be relevant to the Test Manager role and are subject to approval by IIST. Each day counts as one unit. College level courses on software testing or quality topics taken for credits will count as one unit for each one quarter or semester credit hour. Applicants must submit evidence of successful completion of the course and passing the exam. 	<ul style="list-style-type: none"> Classroom courses with no exam required. Courses are at the discretion of the applicant, but must be relevant to the Test Manager role and are subject to approval by IIST. Course topics are up to the applicant's choice, but must be in software testing or software engineering. Each day counts as one unit. Applicants must submit evidence of successful completion of the course 	<ul style="list-style-type: none"> Professional development activities that fall into one of the following activities: Presentations at professional conferences; each presentation counts for 2 units Publications in professional journal, magazines, or electronic forums; each publication counts for 2 units Attending conferences; each day counts as 1/2 unit Web-based courses requiring an exam; each course regardless of length counts as 1/2 unit

The following table shows some examples of number of units from each category to complete the re-certification requirements.

Activities that qualify for each of the categories are described above. In order to count toward re-certification units, activities must be performed during the re-certification period. Evaluation of all activities will be at the discretion of the IIST Chairman.

An applicant for re-certification may submit Non-IIST courses for pre-evaluation for credits. An applicant must submit evidence of successful completion from a recognized training institution along with detailed course material for evaluation. The fee for this evaluation is \$25 per course.

Category A:	Category B:	Category C:
4	2	4
6	2	2
5	5	0
4	6	0
10	0	0
8	0	2

Job Experience Requirements

An applicant shall provide evidence that he or she has continued performing job responsibilities in software testing or related areas. This requirement may be satisfied through a letter from the applicant's manager describing the specific activities performed over the specified period of time.

Application

An applicant for re-certification shall submit the CTM re-certification Application to the Chairman of IIST accompanied by evidence of completing both the educational and experience requirements and \$180 processing fee no later than 60 days before the date the certification expires. The CTM re-certification Application form can be downloaded from our web site at <http://www.iist.org/certification.php>.

The CTM Body of Knowledge

1. Test Process Management <ul style="list-style-type: none">⊙ Quality policies, processes, and standards⊙ Process definition⊙ Process documentation⊙ Relationship with service management JAD, infrastructure processes (incident management, problem management, configuration management, change management, release management, etc.)	<ul style="list-style-type: none">⊙ Defining quality goals⊙ Process control⊙ Best practices, including use of both static & dynamic testing⊙ Test processes for different development models (XP, RAD, waterfall, etc.)
2. Test Project Management <ul style="list-style-type: none">⊙ Test planning⊙ Task identification⊙ Tracking⊙ Identification of roles and responsibilities⊙ Project controls⊙ Metric tracking and presentation⊙ Using automated project management tools Using MS Project/GANTT/PERT charts and other project management techniques	<ul style="list-style-type: none">⊙ Effort estimation⊙ Scheduling⊙ Reporting⊙ Resource allocation (people, hardware, software, and facilities)⊙ Financial analysis and ROI⊙ Presentation skills⊙ Directing, supervising, and assessing individuals' performance⊙ Leadership
3. Test Process Measurement and Improvement <ul style="list-style-type: none">⊙ Test coverage analysis⊙ Defining and capturing test measurements⊙ Test maturity models⊙ Performing assessments and using surveys⊙ Alternative measurement goal-setting with the CMM/CMMI, Basili goal/question/metric paradigm⊙ Overview of the applicable IEEE standards	<ul style="list-style-type: none">⊙ Incident tracking and management⊙ Basic "best practices" development metrics⊙ Establishing process goals⊙ Benchmarking⊙ Overview of process improvement models such as Six Sigma, TQM, ISO, etc.
4. Test Organization Management <ul style="list-style-type: none">⊙ Resource management⊙ Politics⊙ Training and career development⊙ Team building and retention⊙ Budgeting	<ul style="list-style-type: none">⊙ Staffing, hiring, contracting, and reviewing performance⊙ Equipment, facilities, hardware, and software resource management⊙ Ethics⊙ Compensation⊙ Presentation skills including data preparation
5. Risk Management <ul style="list-style-type: none">⊙ Risk analysis methodologies⊙ Calculating costs and probability⊙ Monitoring and controlling risks⊙ Risk-based test planning and management sizing and resource planning	<ul style="list-style-type: none">⊙ Risk identification, classification, and prioritization⊙ Risk reporting⊙ Contingency planning and mitigation

6. Test Automation	
<ul style="list-style-type: none"> ⊙ Defining a test automation strategy and plan ⊙ Test tool evaluation and selection ⊙ Long term maintenance considerations ⊙ Building a performance test team ⊙ Calculating ROI of automation 	<ul style="list-style-type: none"> ⊙ Build it vs. Buy it: automation strategies/approaches ⊙ Developing skills and relevant test automation roles ⊙ Selecting which tests to automate and converting from manual to automated ⊙ Categories of automated tools that can be used to aid testing ⊙ Test environments - test data, architecture, security, networks, etc
7. Software Quality Assurance	
<ul style="list-style-type: none"> ⊙ Quality Assurance vs. Quality Control ⊙ Implementing Quality Assurance ⊙ Developing effective standards ⊙ QA concepts, methods and approaches ⊙ Independent Verification and Validation ⊙ Prominent quality assurance models such as methodologies: RAD, CMM/CMMI, Six Sigma, IEEE standards, Agile and eXtreme, TQM, and ISO 	<ul style="list-style-type: none"> ⊙ Defining processes ⊙ Inspections and review of artifacts other than code ⊙ Development and Test lifecycles and methodologies ⊙ ROI justification for Quality Assurance ⊙ Quality Assurance according to W. Edwards Deming ⊙ Quality Assurance for modern development

Certified Software Test Automation Specialist (CSTAS)

Objectives of the CSTAS Certification

The CSTAS certification aims at achieving the following objectives:

- Help test automation personnel develop the skills necessary to perform all activities related to software test automation for any type of system.
- Help test automation personnel gain a better understanding of the broad range of test automation tools and techniques.
- Expand test automation beyond functional testing to include many other areas such as performance testing, load testing, test management, test automation support, and code level test automation.
- Provide test automation personnel with techniques and methods to design tests for automation.

CSTAS Certification Requirements

Two requirements must be satisfied before the CSTAS certification can be granted. These are the Formal Education Requirements and Experience Requirements

Formal Education Requirements

Candidates must complete a course of study that consists of ten (10) days of training as follows:

- Five days must cover the five core areas of the Software Test Automation Body of Knowledge (STABOK).
- Two days to cover any two of the STABOK elective areas.
- Three days to cover any topics in software testing as deemed appropriate by the candidate.

Job Experience Requirements

In addition to the educational Requirement, a candidate must demonstrate knowledge of at least one commercially available functional test automation tool. This requirement shall be satisfied by submitting to IIST a statement signed by the candidate manager. If the candidate is self-employed or a consultant, the statement must be signed by a client of the candidate for whom the candidate has performed service using the specific tool. The statement shall indicate that the candidate has at least two years experience using the tool.

Written Exam:

Candidates are required to complete a written exam for each course and pass with a level of performance no less than 80%. For courses conducted by IIST, a candidate is allowed to retake the exam for a second time without having to attend the course again. There is a \$100 fee for retakes. If 80% performance is not achieved on a second attempt, the candidate must retake the course or take another course covering the same BOK area.

Graduation

Upon satisfying both formal education and job experience requirements, a candidate shall submit an application to the IIST Chairperson for the certification to be granted. Application forms can be obtained by contacting the IIST office. The application must be accompanied by payment of the \$120 non-refundable graduation fee. This fee covers the cost associated with record-keeping, grading exams, and certification plaque.

The STA BOK Core Areas

1. Test Design for Automated Test Execution

- Understanding Test Design
- Designing tests from requirements
- Designing tests from scenarios
- Requirement-based test design methods and techniques
- Separation of data from scripts
- Code-based test design
- Automation considerations when designing tests
- Selecting candidate tests to automate

2. Introduction to Test Automation

- Overview of automation
 - The purpose of test automation
 - Different uses of technology to manage the testing effort (management, functional, performance, other types of testing, and with different SDLC approaches such as waterfall or iterative)
 - Comparison of the vendor landscape to support test automation
 - Selecting and acquiring test automation tools
 - Determining automation requirements
 - Defining goals and requirements including feasible uses of automation
 - Determining return on investment
 - Application compatibility
 - Vendor selection and evaluation
 - Understanding the potential for diverse vendors and solutions
 - Vendor tool evaluation techniques
- Effective installation and maintenance approaches
 - Infrastructure considerations
 - Implementation approaches that support ongoing ease of use
 - Organizational considerations to support automation
- A Survey of Test Automation Tools
 - Functional Testing tools
 - Through the interface
 - Under the interface
 - Web services
 - Non Function Testing tools
 - Load
 - Performance

- Security
- Code Level tools
 - Structural Test Execution tools
 - Static Testing/Analysis tools
- Test Automation Support Tools and Systems
- Test Management Tools

3. Scripting Methods and Techniques

- Understanding of basic and advanced scripting and programming techniques frequently utilized in Test Automation
- Working with files
- APIHTML
- OCR
- VBScript and Windows in the examples
- Robust Execution
- Object Validation
- Action Validation
- Recovery Design
- Status Reporting
- Maintenance Control
- Regular Expressions for Dynamic Object Recognition
- Dynamic Data Generation
- Object Class Modification
- Business Process Path Modification

4. Database Testing: Structured Query Language (SQL)

- Relational DBMS Basics
- SQL Basics – Select, Insert, Update, Delete
- Using Aggregation to determine data health
- Combining Data from Multiple Tables with Joins
- Foreign Key Problems
- Using Sub-queries
- Generating Test Data
- Views
- Indices
- Testing Scalable Architectures
- Transaction Process Monitor (TPM)
- Database Integrity
- UML Database Model
- Outer Join example for testing
- Queries for Data Verification

5. Test Automation Architecture

- Overview of automation architectures for various testing efforts (functional, performance, etc.)
- Characteristic of a good test automation architecture
- Description of test automation architectures
- Design approaches for architectures
 - Functional
 - Performance
 - Other types

- Design approaches to support the organizational model
 - Minimal automation resources
 - Various levels of experience
 - Unattended testing
- Integrating multiple tools into the design
 - Scripting tools
 - Data query and validation tools

The STA BOK Elective Areas (Candidate must select 5 days of training covering 5 of the areas below)

1. Database Fundamentals for Test Engineers
2. Database Testing: Advanced Topics
3. Risk Based Testing Analysis and Management
4. Testing Web and eCommerce Applications
5. Performance Testing for Web and Client/Server Applications
6. Performance Testing Fundamentals
7. Advanced Performance Testing & Tuning Techniques
8. Programming and Database Concepts for Testing and QA Professionals
9. Programming Concepts for Test and QA Professionals
10. XML and Web Services Testing
11. Application and Data Security Testing
12. A Survey of Test Automation Tools

Certified Software Quality Manager (CSQM)

Purpose

The purpose of the CSQM certification is to help establish and advance the field of software quality management as a discipline independent of the field of software testing. Individuals pursuing Software Quality Management as a career will focus on method and techniques to manage product and process quality in software organizations. It is expected of those individuals to have a very broad range of knowledge with all software processes and ways to improve these processes. The CSQM certification is a natural progression for individuals who have achieved the Certified Test Management Certification to advance their career and be prepared to climb the corporate ladder to occupy higher positions.

Objectives of the CSQM Certification

Software Quality is a very broad concept. To achieve software quality, one must focus on the quality of the software product as well as the quality of the different processes used to produce the software product. In order to achieve this goal, a person in charge of improving quality in a software organization has certain responsibilities and objectives. The CSQM Certification provides the knowledge to help a Software Quality Manager carry out these responsibilities and achieve his or her objectives.

- Evaluating, developing, and monitoring
 - Processes (for development, testing, inspection, CM, etc.)
 - Product and process standards
 - Measurements
- Evaluating and selecting tools
- Assessing the organization's capability
- Facilitating process improvement issues between groups or projects
- Assessing the impact of one process improvement effort on another process or another part of the process
- Publicizing success stories
- Acting as a consultant to projects having special problems or requirements

CSQM Certification Requirements

Two requirements must be satisfied before the CSQM certification can be granted. These are the Formal Education Requirements and Experience Requirements

Formal Education Requirements

Ten days of instructor-led training to cover all ten area of the Software Quality Management Body of Knowledge (SQMBOK). One day to cover each area.

Written Exam:

Candidates are required to complete a written exam for each course and pass with a level of performance no less than 80%. For courses conducted by IIST, a candidate is allowed to retake the exam for a second time without having to attend the course again. There is a \$100 fee for retakes. If 80% performance is not achieved on a second attempt, the candidate must retake the course or take another course covering the same BOK area.

Job Experience Requirements

In order for the CSQM certification to be granted, a candidate must have a total of at least three years working in software projects, including 1 year in a lead or management position. This requirement must be completed by the time CSQM is granted. This requirement shall be met by means of a letter of support describing the candidate's specific role and responsibilities over a period of three years or more. The letter must be authored and signed by any of the following:

- The candidate's current or former supervisor/manager
- The candidate's client or customer (if self-employed)
- A co-worker currently holding a CSQM certification who has worked with the candidate on a project.
- Multiple sources may be submitted to cover the three year period. Any variation from this requirement must be reviewed and approved by the IIST Chairperson.

Graduation

Upon satisfying both formal education and job experience requirements, a candidate shall submit an application to the IIST Chairperson for the certification to be granted. Application forms can be obtained by contacting the IIST office. The application must be accompanied by payment of the \$120 non-refundable graduation fee. This fee covers the cost associated with record-keeping, grading exams, and certification plaque.

The Software Quality Management Body of Knowledge (SQMBOK)

The SQMBOK consists of the following ten core areas:

1. Managing Software Quality

- 1.1. Software Quality defined
- 1.2. Software Quality Assurance and Testing defined and distinguished
- 1.3. The difference between QC&QA
- 1.4. The Software Quality Puzzle
- 1.5. The Software Quality Assurance function
- 1.6. The role of Software Quality Manager
- 1.7. Skill set of a Software Quality Manager
- 1.8. Managing Software Quality Throughout the Lifecycle
 - 1.8.1. Requirement Management and Engineering
 - 1.8.2. Change Control and Release Management
 - 1.8.3. Assuring quality during development
 - 1.8.4. Best Practices in Software Testing
 - 1.8.5. Best practices in Software Inspections and Reviews

- 1.8.6. Defect Tracking and Reporting
- 1.8.7. Defect Prevention
- 1.8.8. Process Improvement Models (CMMI, SIX Sigma)
- 1.8.9. Lean Software Process

2. Establishing the Software Quality Assurance Function

- 2.1. All activities related to establishing an SQA group
- 2.2. Stakeholder Identification
- 2.3. Developing SQA plan
- 2.4. Establish Budget
- 2.5. Establish Personnel
- 2.6. Establish Mission/Objectives
- 2.7. Selling SQA to Management
- 2.8. Demonstrating ROI for SQA efforts
- 2.9. Baseline current software quality levels and Cost of Quality
- 2.10. Defining standards, procedures, methodologies, best practices and guidelines
- 2.11. Instituting metrics and measurements
- 2.12. Deploying processes
- 2.13. Evaluating Methodologies and Automated Tools
- 2.14. Implementing Defect Studies

3. Verification and Validation Methods

- 3.1. Verification and Validation Defined
- 3.2. Unit, integration, System, and User Acceptance Testing including planning and design activities of each
- 3.3. Inspections and other forms of peer reviews
- 3.4. Forms of Inspections and Reviews
- 3.5. Effective and practical inspections practices
- 3.6. Code Analysis
- 3.7. Independent V&V

4. Software Development, Integration, Release, and Support

- 4.1. Traditional SDLC
- 4.2. Agile development
- 4.3. Incremental delivery
- 4.4. Methods for determining and documenting the architecture and design (high-level and detailed) for software products
- 4.5. Methods and activities associated with the release and installation of software systems
- 4.6. Activities associated with supporting and maintaining software products
- 4.7. Change control and management
- 4.8. Activities involved in choosing, contracting with, and assuring the performance of software suppliers (both those who provide commercial off-the-shelf COTS products, and those that do custom development)

5. Configuration Management

- 5.1. Principles and activities of the Discipline of Software Configuration Management
- 5.2. Identifying configuration items
- 5.3. Establishing baselines
- 5.4. Controlling change
- 5.5. Establishing and maintaining repositories
- 5.6. Assuring the integrity of software work products.

6. Project Management and Planning

- 6.1. Activities associated with planning projects including size, effort and cost estimation, schedule development, resource planning, knowledge and skills planning, etc.
- 6.2. Activities associated with managing projects including comparing actual measures to estimates, determining project status, managing risks, reporting status, taking corrective action, tracking action items
- 6.3. Requirement-based project management

7. Risk Management

- 7.1. Risk analysis methodologies
- 7.2. Risk identification and classification
- 7.3. Risk prioritization and ranking
- 7.4. Calculating costs and probability
- 7.5. Risk reporting
- 7.6. Monitoring and controlling risks
- 7.7. Contingency planning and mitigation

8. Requirement Engineering and Management

- 8.1. Defining and validating requirements
- 8.2. Quality Requirements Vs Functional Requirements
- 8.3. Quality Requirements for different types of systems
- 8.4. Managing and maintaining requirements
- 8.5. Building a Requirement-Management Process
- 8.6. Requirement Traceability
- 8.7. Requirement Change Control

9. Agile Software Development Methods

- 9.1. The values, principles and philosophies that underpin Agility
- 9.2. Contrasting Agile philosophy to other iterative and incremental lifecycles
- 9.3. Contrasting Agile with the waterfall model
- 9.4. Agile methods and method tailoring
- 9.5. Agile methods and project management
- 9.6. Suitability of Agile methods
- 9.7. Progressive requirements elaboration
- 9.8. Iterative planning and adaptation
- 9.9. Incremental product delivery
- 9.10. Coaching self-directed teams
- 9.11. Agile project monitoring
- 9.12. Welcoming project change
- 9.13. Interpreting Agile practices relative to reference models (e.g. CMMI or PMBOK)
- 9.14. Criticism

10. Software Measurement & Analysis

- 10.1. Purpose of Measurement
- 10.2. Principles of Measurement
- 10.3. Measurement Process Model and Framework
- 10.4. Multilevel Measurements
 - 10.4.1. Organizational Level Measurements
 - 10.4.2. Project Level Measurements
- 10.5. Choosing the best measures for your organization
 - 10.5.1. Align measurements with information needs
 - 10.5.2. Specify measures
 - 10.5.3. Specify data collection and storage
 - 10.5.4. Specify analysis
 - 10.5.5. Specify reporting, communications, and feedback
- 10.6. Goal/Question/Metric Paradigm
- 10.7. A set of ‘Best Practices’ measurements, used by SQA staffs, with examples and Case Studies.

Develop your Career Through
Education-Based Certifications

Achieve the Prestigious Designations:

CSTP-A
Certified
Certified Software Test Professional
Associate Level

CSTAS
Certified
Certified Software Test Automation
Specialist

CSTP-P
Certified
Certified Software Test Professional
Practitioner Level

CTM
Certified
Certified Test Manager

CSTP-M
Certified
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