



## Principles of Software Testing and Quality Assurance

### PROGRAM DESCRIPTION

*Principles of Software Testing and Quality Assurance* is a 9-hour online course. It is a component of the Software Quality Institute's Software Project Management (SWPM) Certificate Program. SWPM itself contains three courses: 1) Principles of Software Testing and Quality Assurance, 2) Essentials of Software Project Management and 3) Management of Software Technology and Teams. All three courses are required for certification, but all may be taken as a stand-alone course. The courses may be taken in any order.

SWPM offers a thorough view of the most up-to-date software best practices, taught by expert practitioners from industry. With a focus specifically on software, the Software Project Management Certificate program results in a working knowledge that incorporates quality, applicability, profitability and timeliness.

### COURSE DESCRIPTION

This course presents strategies that will confirm that the software under development meets the business requirements and solves the problem. It goes further to underline testing mechanisms that can be applied throughout the software development life cycle to reduce defects and resolve root-cause problems in the development process to prevent defects from occurring. Testing and quality assurance include activities that have significant impact on the quality of delivered software. In particular, testing safety-critical software and real-time software applications has to be carefully planned and must be performed effectively and efficiently. Since allocated resources are limited, the use of sound testing techniques during the planning and execution of these activities is crucial. In this section, various aspects involved in the testing process are introduced. The key testing techniques, approaches, and strategies are explained. Finally an introduction to software quality assurance is provided.

### KEY LEARNING OBJECTIVES:

- Software “V” model of testing
- Static and dynamic testing techniques
- Software testing metrics
- Process management
- Quality software processes
- Risk management
- Configuration management and quality assurance



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## **COURSE CURRICULUM**

### Week 1 – Test Planning

- *Topics include* overview of testing; famous testing disasters; why testing is hard; testing principles; software testability; test case design; testing levels; test planning
- *Total run-time* 1:27:13

### Week 2 – Test Execution

- *Topics include* error-prone code; debugging; white-box testing; black-box testing
- *Total run-time* 1:12:22

### Week 3 – Software Inspection

- *Topics include:* detection methods; inspections; reviews; structured reviews; audits; coding standards; code checklists; communication
- *Total run time* 0:48:24

### Week 4 – Software Testing Metrics

- *Topics include* measurement principles; basili goal-question-metric paradigm; balanced scorecard; testing tools
- *Total run-time* 1:07:03

### Week 5 – Process Management

- *Topics include* process management activities; defining the process; process measurement; process evaluation; process maturity; IEEE standard 1074
- *Total run-time* 0:42:31

### Week 6 – Risk Management

- *Topics include* what is risk management; risk management models; identifying risk; analyzing risk; controlling risk; developing a response plan; risk management tools
- *Total run-time* 1:25:04

### Week 7 – Software Tools

- *Topics include* automated project management tools; software development tools
- *Total run-time* 0:37:00

### Week 8 – Configuration Management

- *Topics include* management and planning; control; status accounting; release planning; auditing; configuration identification; version description documents
- *Total run-time* 0:53:32

### Week 9 – Quality Assurance

- *Topics include* historical CoSQ; modern CoSQ; CoSQ in practice; SW quality models; planning and defining quality; testing strategies; release decisions; minimal best practices
- *Total run-time* 1:26:18