

# Software Quality Engineering Curriculum

## SQC-525: Software Configuration Management

**Length:** 2 days

**Tuition:**

### Course Goal

Upon completion of this course, the student will understand concepts and methodologies for software configuration management as given in the body of knowledge for certification for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ). This course covers section VII of the CSQE body of knowledge.

### Course Description

This course enables students to apply various control processes, including version control, traceability requirements, specifications, etc., to existing or planned systems, as well as to identify and apply various tools and methods for establishing and maintaining traceability design, including backward and forward traceability, and explain how they are related to configuration management objectives. Students also learn about related procedures for document distribution, approval, storage, retrieval, revision, planning, scheduling, and hardware and software dependencies, and describe these in relation to product release requirements and related issues.

At the end of the course, relevant sample questions from the body of knowledge of ASQ's Software Quality Engineering Certification exam are discussed.

### Broad Topics

- Configuration infrastructure
  - Roles and responsibilities
  - Library/repository processes
  - Defect tracking and library tools
- Configuration identification
  - Configuration items
  - Baselines
  - Configuration identification methods
  - Software builds
- Configuration control
  - Item and baseline control
  - Proposed modifications
  - Review and configuration control boards
  - Concurrent development
  - Traceability
  - Version control
- Release and distribution issues
  - Product release process issues
  - Packaging, production and distribution

### Target Audience

Any individual who is seeking to be certified for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ).

### Prerequisites

None.

“Controlling complexity is the essence of computer programming.”

-- Brian Kernigan

## Contact VRDS

Call  
(732) 219-5935

Email  
info@vrds.com

Fax  
(888) 291-6501

Visit  
<http://www.vrds.com>

# Software Quality Engineering Curriculum

## SQC-520: Software Inspection, Testing, Verification and Validation

**Length:** 2 days

**Tuition:**

### Course Goal

Upon completion of this course, the student will understand concepts and methodologies for software inspection, testing, verification and validation as given in the body of knowledge for certification for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ). This course covers section VI of the CSQE body of knowledge.

### Course Description

This course helps students understand various types of reviews and inspections, including desk-checking, walk-throughs, Fagan and Gilb inspections, technical accomplishments, and select various methods for verification and validation. Students also develop various types of tests, including functional, performance and regression tests, and apply various test strategies, including top-down, bottom-up, black-box, white-box and others. Finally, students apply methods for creating and evaluating test plans, including system acceptance and validation, to determine whether or not project objectives are being met.

At the end of the course, relevant sample questions from the body of knowledge of ASQ's Software Quality Engineering Certification exam are discussed.

### Broad Topics

- Theory
  - V&V planning procedures and tasks
  - Evaluating software products and processes
- Reviews and inspections
  - Types of inspections and items
  - Data collection, reports and summaries
- Test planning and design
  - Types of tests, tools, strategies and design
  - Test coverage of specifications
  - Test plans, execution, evaluation, implementation and reviews
  - Code coverage metrics

### Target Audience

Any individual who is seeking to be certified for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ).

### Prerequisites

None.

“The most likely way for the world to be destroyed, most experts agree, is by accident. That's where we come in; we're computer professionals. We cause accidents.”

-- Nathaniel Borenstein

## Contact VRDS

Call  
(732) 219-5935

Email  
info@vrds.com

Fax  
(888) 291-6501

Visit  
<http://www.vrds.com>

# Software Quality Engineering Curriculum

## SQC-515: Software Metrics, Measurement and Analytical Methods

**Length:** 3 days

**Tuition:**

### Course Goal

Upon completion of this course, the student will understand concepts and methodologies for software metrics, measurement and analytical methods as given in the body of knowledge for certification for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ). This course covers section V of the CSQE body of knowledge.

### Course Description

This course helps students understand the concepts related to metrics and measurement of software errors, reliability and validity. Students become familiar with important statistical concepts such as measurement, mean, median, mode, standard deviation, variance and the central limit theorem. In addition, participants learn how to use metrics to measure various aspects of software and design defects. They will also be taught how to use quality analysis and problem-solving tools such as flow charts, Pareto charts, cause and effect diagrams, check sheets, scatter diagrams, control (run) charts, histograms, affinity and tree diagrams, matrix diagrams, interrelationship digraphs, prioritization matrices and activity network diagrams.

At the end of the course, relevant sample questions from the body of knowledge of ASQ's Software Quality Engineering Certification exam are discussed.

### Broad Topics

- Metrics and measurement theory
  - Definitions
  - Basic measurement theory and techniques
  - Psychology of metrics
- Process and product measurement
  - Process, product and resource metrics
  - Commonly used metrics
  - Software quality attributes
  - Defect detection effectiveness measures
  - Program performance and process effectiveness
- Analytical techniques
  - Data integrity
  - Quality tools
  - Sampling theory and techniques

### Target Audience

Any individual who is seeking to be certified for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ).

### Prerequisites

None.

“Measure what is measurable, and make measurable what is not so.”

-- Galileo Galilei

## Contact VRDS

Call  
(732) 219-5935

Email  
info@vrds.com

Fax  
(888) 291-6501

Visit  
<http://www.vrds.com>

# Software Quality Engineering Curriculum

## SQC-510: Software Program and Project Management

**Length:** 2 days

**Tuition:**

### Course Goal

Upon completion of this course, the student will understand concepts and methodologies for software program and project management as given in the body of knowledge for certification for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ). This course covers section IV of the CSQE body of knowledge.

### Course Description

This course helps students learn the basics of program and project management using factors such as forecasts, resources and schedules to develop, initiate and accomplish project goals. Students also gain an understanding of how to identify and use milestones, task durations and other goal-setting methods, as well as how to use visual tools such as PERT and Gantt charts. Finally, students learn risk management and avoidance methods.

At the end of the course, relevant sample questions from the body of knowledge of ASQ's Software Quality Engineering Certification exam are discussed.

### Broad Topics

- Planning
  - Project planning elements
  - Goal setting and deployment
  - Project planning tools
  - Cost and value data
- Tracking and controlling
  - Phase transition control techniques
  - Interpreting and reporting cost of quality data
  - Tracking elements and methods
  - Project reviews
- Risk management
  - Risk management planning methods
  - Risk probability
  - Product release decisions
  - Software security, safety and hazard analysis issues

### Target Audience

Any individual who is seeking to be certified for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ).

### Prerequisites

None.

## Contact VRDS

Call  
(732) 219-5935

Email  
info@vrds.com

Fax  
(888) 291-6501

Visit  
<http://www.vrds.com>

# Software Quality Engineering Curriculum

## SQC-505: Software Engineering Processes

**Length:** 2 days

**Tuition:**

### Course Goal

Upon completion of this course, the student will understand concepts and methodologies for software engineering processes as given in the body of knowledge for certification for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ). This course covers section III of the CSQE body of knowledge.

### Course Description

This course focuses on the software engineering process and lifecycle. Students start with an introduction to various lifecycle and process models, and compare and contrast the pros and cons of each model. Students then learn systems architecture concepts and terminology, and examples of their use in real-world situations. Next, the course examines requirements engineering, followed by important concepts in software design. Finally, the students learn how to maintain current and legacy code.

At the end of the course, relevant sample questions from the body of knowledge of ASQ's Software Quality Engineering Certification exam are discussed.

### Broad Topics

- Lifecycle and process models
  - Waterfall, prototyping, spiral, V-Model, OOP, etc.
- Systems architecture
- Requirements management
  - Prioritization and evaluation
  - Change management
  - Traceability
- Requirements engineering
  - Requirements types
  - Requirements elicitation
  - Quality function deployment
  - Requirements analysis and modeling
  - Requirements specifications
- Analysis, design and development methods and tools
  - Design methods
  - Software reuse
  - Software defect prevention
  - Software development tools
- Maintenance management

### Target Audience

Any individual who is seeking to be certified for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ).

### Prerequisites

None.

“A computer is a stupid machine with the ability to do incredibly smart things, while computer programmers are smart people with the ability to do incredibly stupid things. They are, in short, a perfect match.”

-- Bill Bryson

## Contact VRDS

Call  
(732) 219-5935

Email  
info@vrds.com

Fax  
(888) 291-6501

Visit  
<http://www.vrds.com>

# Software Quality Engineering Curriculum

## SQC-500: Software Quality Management

**Length:** 2 days

**Tuition:**

### Course Goal

Upon completion of this course, the student will understand concepts and methodologies for software quality management as given in the body of knowledge for certification for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ). This course covers section II of the CSQE body of knowledge.

### Course Description

This course focuses on quality goals, methodologies and audits as they apply to software. Students start with an overview of quality goals, including principles, policies, tactics and outsourcing, as well as the scheduling, resource and customer requirements necessary to achieve those quality goals and objectives. Participants then go on to learn defect detection methods, how to distinguish between these procedures for software defects, what constitutes process nonconformance, and other quality system deficiencies. They are also taught how to select and implement information systems and models to track quality data in various situations. Finally, the students learn about auditing, including preparation, execution, reporting and follow-up.

At the end of the course, relevant sample questions from the body of knowledge of ASQ's Software Quality Engineering Certification exam are discussed.

### Broad Topics

- Goals and objectives
  - Quality goals for programs and projects
  - Impact of acquisitions and subcontractor services
  - Evaluate scheduling and resource requirements
  - Elements of SQM system documentation
  - Analyze and evaluate customer requirements
- Methodologies
  - Defect detection methods
  - Change management
  - Analyze cost of quality
  - Models used to track quality data
  - Problem reporting
  - Quality improvement
- Audits
  - Roles and responsibilities
  - Audit types
  - Tools and procedures in conducting audits
  - Audit reporting

### Target Audience

Any individual who is seeking to be certified for Software Quality Engineering (CSQE) by the American Society for Quality (ASQ).

### Prerequisites

None.

“What we do is never understood, but only praised and blamed.”

-- Friedrich Nietzsche

## Contact VRDS

Call  
(732) 219-5935

Email  
info@vrds.com

Fax  
(888) 291-6501

Visit  
<http://www.vrds.com>

## Software Quality Engineering Curriculum

VR Data Systems offers our Software Quality Engineering Curriculum to any individual who is seeking certification in software quality engineering from the American Society for Quality (ASQ). All courses in this curriculum are offered as a starting point for preparation for certification or for those who simply need a refresher of any concepts covered in the exam. Our courses will provide an in-depth understanding of software quality engineering and will allow participants to immediately apply these concepts at work or in preparation for the exam. Students will learn through practical applications, and are welcome and encouraged to use challenges from their own profession as learning tools during class discussions.

**NOTE:** While classes in this curriculum offer in-depth coverage of most topics in the CSQE exam, further self-study and preparation, as well as professional experience, is still required to pass the CSQE exam.

### Courses

Code	Course Title	Length	Tuition
SQC-500	Software Quality Management	2 Days	
SQC-505	Software Engineering Processes	2 Days	
SQC-510	Software Program and Project Management	2 Days	
SQC-515	Software Metrics, Measurement and Analytical Methods	3 Days	
SQC-520	Software Inspection, Testing, Verification and Validation	2 Days	
SQC-525	Software Configuration Management	2 Days	

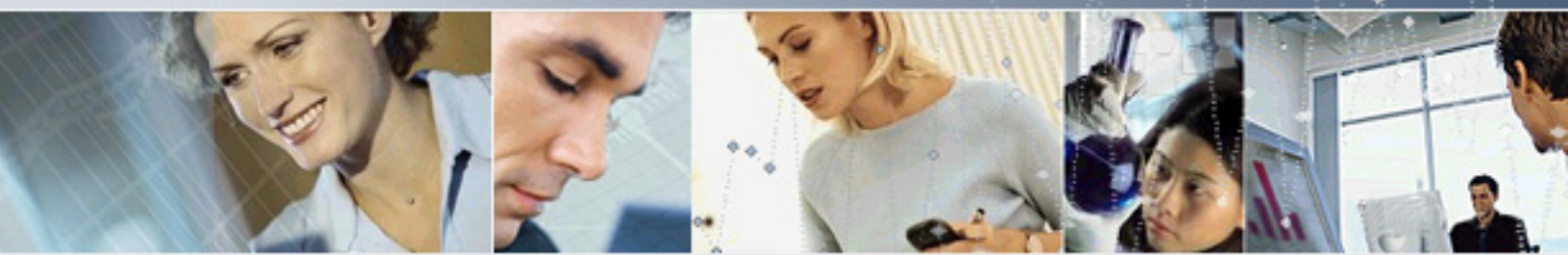
### Customized Courses

VR Data Systems will customize any course(s) to suit the unique business requirements of our clients. From the modification of standard curriculum to new course development, we will provide the education and training your organization needs to be more productive in today's competitive environment. Ask a VR Data Systems representative for more information.

In addition, VRDS will work within your busy schedule to accommodate your time frames and deadlines. For example, we can split up any multiple-day course into individual one-day sessions that can be held on any weekday and/or weekend, or even conduct half-day sessions during morning, afternoon or evening hours.

### About VR Data Systems, Inc.

VR Data Systems, Inc. (VRDS) is a training and consulting firm that specializes in Quality, Statistics, and Data Analysis. For more than 15 years, we have offered comprehensive, hands-on curricula for professionals at any experience level in numerous industries, including Pharmaceutical, Clinical, Manufacturing, Financial, and Software & Hardware Development. Our courses are taught by seasoned instructors who possess long-term expertise in their respective fields – from Sales and Marketing to Finance and R&D.



# SOFTWARE QUALITY ENGINEERING

