Introduction to Software Quality Assurance, Control and Management

Course Summary

Description

This course is a three day introduction and overview of the fundamentals of software quality along the dimensions of quality control, quality assurance and quality management.

The course begins with a look at the overall subject of quality and the evolution of quality thinking and practices in the field of software development. Successful quality practical principles and ideas across various industries are compared to provide a baseline for assessing and understanding quality practices when they are applied to software so that students understand what works and does not work from a general quality perspective. In the quality control section, the focus in on measurement of quality. This includes an introduction to testing techniques and principles, setting quantitative quality objectives, understanding metrics, setting performance goals and evaluation performance and quality. This section underscores the the principle that of all quality assurance and management is built on the results of being able to measure what is being done and being produced.

Moving to quality assurance, the focus is on the process and learning how to identify, document and analyze processes from a quality point of view. The quality control principles are put into a process context with a shift in emphasis to managing quality results rather than just measuring the outputs of the process. The topics of process maturity and process improvement are central to this discussion.

The third main area in the course is the quality management dimension. The course looks at quality from an organizational perspective, looking at how quality programs are initiated, developed, managed and assessed within an organization, and how these quality management activities set the parameters for everything that is done in the quality assurance and control dimensions. A critical part of this discussion is the Quality Maturity Model which is used to provide a practical framework for introducing and developing quality programs.

Topics

- Introduction to Quality
- Quality Control I
- Baselines and Gap Analysis
- Processes I
- Quality Assurance
- Quality Control II

- Quality Management
- Quality Maturity
- Processes II
- Quality Leadership
- Related Issues

Audience

The course is for those who will be involved in any phase of quality control, assurance or management.

Prerequisites

There are no prerequisites for this course.

Duration

Three days

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Course Outline

I. Introduction to Quality
The idea of quality in general is introduced by looking at various quality principles and basic concepts. Quality is looked at in several industries to provide models of how quality has worked and the practices that have been successful in a variety of circumstances and environments. The relationship between quality and other business functions and practices is introduced.

II. Quality Control I
In this first section on QC, the basics for defining measurements and metrics are introduced. The protocols for testing and the importance of valid testing for measurement are stressed with emphasis on being able to plan and do QC on the QC activities.

III. Baselines and Gap Analysis
This section addresses the fundamental issues of establishing the "where we are now" versus "where we would like to be "gap analysis, emphasizing the importance of good QC to develop metrics for that analysis, especially as they relate later in the course to setting quality goals.

IV. Processes I
This section is an introduction into processes covering standard topics of process discovers identification, documentation and modeling. Emphasis will be given to Software Development Processes and their structure and organization.

V. Quality Assurance
This module shifts to looking at processes from a quality assurance perspective, introducing the idea of defect prevention and root cause analysis using our understanding of processes to not only prevent defects but also to perform process improvement.

VI. Quality Control II
This section now extends the ideas and techniques introduced in the first QC section to doing QC on processes as a part of the QA process. The idea of Just In Time testing is introduced as an implementation of QA measurement.

VII. Quality Management
This section shifts scope to the management of quality and unifies many of the ideas that have been presented in the course so far. Techniques for identifying, documenting and creating quality objectives that are used as the basis for metrics and strategies in QA and QC are introduced in this section.

VIII. Quality Maturity
This section introduces the notion of quality maturity, or how organizations evolve in their experience and mastery of quality management. Standard models of quality maturity cross industries are introduced as well as the software specific Testing Maturity Model.

IX. Processes II
This section uses the ideas of quality as a process to introduce the notions of doing QA on the QA processes – or in in other words, how we evaluate and improve our own quality efforts.

X. Quality Leadership
This section looks at the broader organizational issues around developing, designing and implementing a quality program in an organization. Specific strategies are examined and evaluated.

XI. Related Issues
The extension of Quality management to security analysis, COTS, risk analysis and other related issues are also introduced and discussed.