

OMSE 525: Software Quality Analysis

Winter 2008 (hybrid offering)

Instructor: Kal Toth, ktoth@omse.pdx.edu

Course Description

This course addresses processes, methods, and techniques for developing quality software, for assessing software quality, and for maintaining the quality of software. This course explores tradeoffs between software cost, schedule, and quality as well approaches for integrating quality into the software development process. Quality methods including formal review and inspection; test planning and testing; software maintenance; and software safety are covered.

Course Delivery Modes

Face-to-face, on-line (only) and hybrid versions of this course are available. All three versions use PSU's online learning system to provide access to learning materials. Topical discussions are conducted on-line and individual assignments are downloadable "take homes" requiring students to upload them into the learning system.

This is a "hybrid" offering of this course (see OMSE ONLINE on the web site for more details). You may attend classes at the scheduled location posted on the OMSE web site. You will also be participating in online discussion forums every week. Your participation in online discussions will be evaluated and will be the basis for your grades. You will be provided instructions on how to access the course materials and related services by the first week of class.

Prerequisites

OMSE 500 Principles of Software Engineering (or equivalent) plus two or more years of experience in software development or software maintenance.

Aims and Objectives

Quality cannot be added to software after it is developed, but must be attended to throughout the software development process. Real knowledge of software quality requires systematic and sometimes rigorous analysis in accordance with the demands of the customer and the application environment. Quality software can be very easily destroyed during operations and maintenance. This course describes what we mean by software quality and software quality engineering introducing the primary techniques for attaining and assessing software of sufficient quality for the problem at hand. Upon completing this course the student should be able to:

- Understand how the process elements of the development process contribute to software quality.
- Choose among software quality engineering alternatives to achieve "good enough" software quality.
- Evaluate the organization and procedures needed to attain a given level of quality.
- Develop a system test plan for a software project.
- Choose appropriate testing methods for each phase of software development and maintenance.
- Participate effectively in inspections/reviews of software products.
- Understand the relevancy to quality and application of software configuration management
- Develop a quality-improvement plan for software products.
- Understand, select and apply appropriate quality metrics, goals and activities for a given problem.
- Understand software engineering goals and process implications of critical reliability, safety, security and other special quality attributes of software products and systems.

The Instructor

Dr. Kal Toth is an Associate Professor in the Maseeh College of Engineering and Computer Science at Portland State University in Portland Oregon. He is the Associate Director of the Oregon Master of Software Engineering (OMSE) program. He has over 25 years of industry experience including Hughes Aircraft, CGI Group Inc., Datalink Systems Corp, Intellitech Canada Ltd. and several Canadian federal

government agencies. Kal has a Ph.D. in EE (computer systems engineering) from Carleton University (Ottawa) and is a P.Eng. (British Columbia) with a software engineering designation.

Required Textbooks and Resources

Jeff Tian, *Software Quality Engineering* (SQE), Wiley-Interscience, 2005; ISBN 0-471-71345-7.

Additional required and optional readings will be posted online. Each week, all assigned readings are to be completed before embarking on discussions and assignments for that week.

Workload Distribution

You are expected to complete the readings and lecture materials, and respond critically to the related discussion questions and assignments. To succeed in this course, students are expected to devote 10-12 hours of study per week as follows:

- Review the required textbook, lecture notes and reference materials (5+ hrs/week)
- Participate in discussions and complete assignments (5+ hrs/week).
- Guidelines and structure for discussions and assignments will be provided by the instructor.

Policy on Student Collaboration and Academic Integrity

You are encouraged to discuss the course material and the assignments with other students. However, all assigned work must be done individually unless the instructor explicitly tells you otherwise. You are expected to read and review the policy on academic integrity. Please contact the professor if you have any doubts about the propriety of your course activities.

Course Calendar

Week	Textbook (ch.)	Topics
1	1,2	Introduction to OMSE 525; Introduction to Software Quality
2	3,4,5	Software Quality Assurance, Organization, Engineering
3	6,7	Test Concepts, Activities, and Planning
4	8,9,11,12	Testing Techniques
5	14	Software Inspection
6	posted readings	Software Configuration Management
7	13, 18	Software Quality Metrics
8	19	Software Process Improvement
9	15,16, 21, 22	Software Quality in Mission-Critical Systems
10		Course Review