

**CS455 Topics in Computer Science: Software Quality Assurance**  
**Fall Term: September 9 – December 16, 2004**

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**COURSE DESCRIPTION:**

This course addresses the issue of quality throughout the software development process, including design, implementation, testing, and delivery. Special attention will be given to setting quality standards, developing quality measurement techniques, writing test plans, rapid prototyping, and testing the user interface. Relevant quality standards will be reviewed.

**COURSE OBJECTIVES:**

Students will be introduced to the issues of quality throughout the software engineering design process. Topics covered include the software life cycle, software quality, testing strategies and methods, quality requirements analysis, quality issues of architectural design, data design, detailed design methods, software project management, and miscellaneous topics.

**COURSE REQUIREMENTS:**

Students will participate as members of one of several teams on a software project. There will be design and code reviews and a student project leader will assure timely delivery of the results before the end of the term. (The individual projects are allowed). The software is expected to be integrated and run without error on a computer in the Rivier College Computer Lab. Each person will have a specific “role” on the team and will receive a grade for efforts as an individual team member as a team grade.

**COURSE PREREQUISITES:**

CS405 Introduction to Software Engineering  
Preliminary Core Courses (C/C++ or Java and Data Structures)

**COURSE TEXTBOOK:**

- Daniel Galin: *Software Quality Assurance: From Theory to Implementation*, Addison Wesley Publishing Company; (September 1, 2003), ISBN: 0201709457.

**RECOMMENDED TEXTBOOKS:**

- Sommerville, Ian: *Software Engineering*, 7<sup>th</sup> Edition; Addison-Wesley, Reading, MA, (2004). Slides can be downloaded from URL: <http://www.comp.lancs.ac.uk/computing/resources/SE6/Slides/index.html>;  
Software Engineering Resources: <http://www.comp.lancs.ac.uk/computing/resources/ser/SE.links.html>.
- Frank P. Ginac: *Customer Oriented Software Quality Assurance*, 1st edition; Pearson Education; (December 19, 1997), ISBN: 0135714648.
- G. Gordon Schulmeter and James I. McManus: *The Handbook of Software Quality Assurance* (3rd Edition), Prentice Hall PTR; (January 15, 1999), ISBN: 0130104701.
- Marnie L. Hutcheson: *Software Testing Fundamentals: Methods and Metrics*, 1st edition; John Wiley & Sons; (April 11, 2003), ISBN: 047143020X.

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- John W. Horch: *Practical Guide to Software Quality Management* (Artech House Computer Library), 2nd edition; Artech House Publishers; (February 1, 2003), ISBN: 1580535275.
- Dennis, Wixom, and Tegarden, *System Analysis & Design: An Object-Oriented Approach with UML*, John Wiley & Sons, Inc., 2002 (Resources: <http://www.wiley.com/college/dennis/>).
- Stephen R. Schach, *An Introduction to Object-Oriented Systems Analysis and Design with UML and the Unified Process*, McGraw-Hill, 2004 (Resources: <http://www.mhhe.com/schach/>).
- Roger S. Pressman, *Software Engineering: A Practitioner's Approach*, 6<sup>th</sup> edition, McGraw-Hill Higher Education, (2005), ISBN: 0072853182. Resources: <http://www.rspa.com/spi/index.html>

**EXAMINATIONS and GRADING:**

Weekly Homework Assignments	60%
Individual or Team Software Project	30%
Surprise Quizzes	10%
Presentations, Active Participation	up to 5 Points extra credit

**CLASSROOM POLICIES:**

Any late assignments will receive a 10% grade discount. Assignments must be completed on time. Only those situations involving instructor's permission will be exempt from this policy. Instructor must know in advance of class that a student will not be present or an assignment will be late.

**COMPUTER LABORATORY:**

Students will be required to use the College computers in the Computer Lab for coding and testing the software. Since this is a team project all software must be available in a single place. The Lab equipment can be used between 9 a.m. and 10 p.m. If you have any problems with the equipment, etc., contact Sister Martha's office in the Computer Lab.

**COMPUTER LANGUAGES:**

Either Java or C/C++ may be used. The IBM Rational Software Development Suite may be used for the team or individual project development. The Project Leader will be responsible for assuring designers create "compatible" modules and properly link modules, which are not from the same source language.

**INSTRUCTOR AVAILABILITY:**

I will be available before and after class, during the office hours at my office (STH-312) and via telephone: (603) 897-8613 or E-mail: [vriabov@rivier.edu](mailto:vriabov@rivier.edu) (E-mail is a preferable form for communication).

**CLASS SCHEDULE:**

Week	Date	Subject	Output from Class	Text Reading
01	Sept. 9	Intro: SW Quality Engineering		Ch. 2
01	Sept. 9	Software Quality Factors	Form Project Teams	Chs. 3, 4
02	Sept. 16	Development and Quality Plan	Team Project TOPIC Due	Ch. 6
03	Sept. 23	Verification, Validation and Qualification.	Homework #1 Due	Ch. 7
03	Sept. 23	Review Methods	Functional Spec Due	Ch. 8; Notes
04	Sept. 30	Software Testing Strategies; Software Testing Methods	Functional Spec FROZEN	Chs. 9, 10; Notes
05	Oct. 7	Maintenance Life Cycle Quality Assurance Tools	Homework #2 due	Ch. 11; Notes
06	Oct. 14	Case Tools	Homework #3 due	Ch. 13

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06	Oct. 14	Object-Oriented Design Tools		Notes
07	Oct. 21	Configuration Management	DESIGN SPEC due	Ch. 18
08	Oct. 28	Documentation and Quality Records Controls	Homework #4 due	Ch. 19
08	Oct. 28	User Interface Design		Notes
09	Nov. 4	Project Progress Control	Design Rev Report Form due	Ch. 20
10	Nov. 11	Software Quality Metrics	Homework #5 due	Ch. 21; Notes
11	Nov. 18	Software Cost Estimations	FROZEN Revised Design Spec	Ch. 22
<b>12</b>	<b>Nov. 25</b>	<b>NO CLASSES</b>	<b>NO CLASSES</b>	<b>NO CLASSES</b>
13	Dec. 2	SQA Standards; ISO 9001 Certification	Homework #6 due	Chs. 23, 24
14	Dec. 9	Software Process Assessment	Project Manager Status due	Ch. 25
<b>15</b>	<b>Dec. 16</b>	<b>Project Presentations</b>	Software Accepted/Rejected	Source Listings & SW Docs due

Thursdays, 7:45 PM – 9:45 PM