Sftwr Testng/Qual Assurnc
CS 7314 001C
Computer Science Department
Spring 2024

Instructor Information

Instructor: Jeff Tian
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Office Hours:
Tuesdays 3-5pm and by appointment
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Welcome Message/Bio:
Dr. Jeff Tian is a professor of Computer Science at SMU. Before joining SMU in 1995, he was a process/quality analyst at the IBM Software Solutions Toronto Lab between 1992-1995. He received his Ph.D. in Computer Science from the University of Maryland at College Park in 1992 and M.S. in Engineering Science from Harvard University in 1986. His research interests include software testing and quality assurance, empirical software engineering with a focus on software metrics/analysis/improvement, software reliability/usability/safety, and applications to commercial/web-based/embedded/Cloud/human-machine/service-oriented systems, with a focus on user-centered and quantifiable quality improvement. More information about him can be found in his homepage at: s2.smu.edu/~tian.

Course Details

Meeting Days/Times/Locations:

Start Date	End Date	Location	Meeting Day	Start Time	End Time
01/16/2024	04/30/2024	CARU0379	MW	02:00 PM	03:20 PM

Credit Hours: 3.00
Course Description: Examines the relationship of software testing to quality, with emphasis on testing techniques and the role of testing in the validation of system requirements. Topics include

module and unit testing, integration, code inspection, peer reviews, verification and validation, statistical testing methods, preventing and detecting errors, selecting and implementing project metrics, and defining test plans and strategies that map to system requirements. Testing principles, formal models of testing, performance monitoring, and measurement also are examined.

Student Learning Outcomes

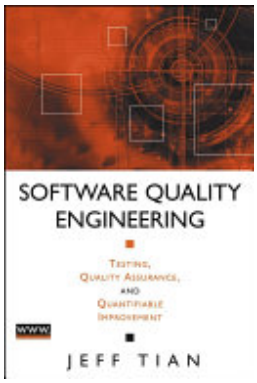
Software quality assurance (SQA or simply QA) includes testing and various other activities, carried out by software-development/system-support and other organizations, aimed at ensuring that appropriate functionalities have been implemented correctly and efficiently in the software systems or software-related products or services to satisfy the requirements and expectations (needs and wants) of their target customers and users.

We will devote slightly more than half of the class time to topics related to software testing, or running/executing the software in order to observe its behavior to ensure that it conforms to our expectations or to identify behavior deviations and possible underlying problems for correction. We will emphasis formal/systematic testing techniques and their applications.

The rest of the class time will be devoted to the following topics: 1) General concepts about quality, quality assurance (QA), and software quality engineering (SQE). QA activities and SQE process will also be discussed,in the context of overall software development and maintenance processes. 2) Other QA alternatives beyond testing, including, activities and related techniques for defect prevention and process improvement, inspection/review/walkthrough, formal verification, and defect containment through fault tolerance or safety assurance techniques. 3) Quality assessment and improvement, including, overall strategy for quantifiable quality improvement, measurement and feedback mechanisms, quality models and measurements, defect classification and analysis, risk identification and analysis, and software reliability engineering.

A more detailed description of the course contents is available at the course website at: s2.smu.edu/~tian/class/7314.24s.

Required Texts and Materials



Software Quality Engineering
Subtitle: Testing, Quality Assurance, and Quantifiable Improvement
ISBN: 9780471722335
Authors: Jeff Tian
Publisher: John Wiley & Sons
Publication Date: 2005-05-20
Slides available at: s2.smu.edu/~tian/SQEbook.

Grading Policies/Grading Scale

The course grade each student receives will reflect the weighted average of exams, homework assignments, and course project. The approximate weight assignment is as follows:

- Homework and participation: 15%
- Exam #1: 17%
- Exam #2: 17%
- Final Exam: 17%
- Project: 34%

Based on the weighted average, the approximate letter grade assignment is as follows:

top quartile (75th percentile or above)	A_ to A
around median (50th percentile) to 75th percentile	B+ to A_
below the above percentile/class-standing	B or below

Assignment Group Descriptions

Homework assignments will be completed by each student individually.

Course project: either individual or small group (typically team size of 2).

See the grading policy for the relative weights of these assignments.

Course Policies

If you need to make alternative arrangements for turning-in material or taking exams, you must contact the instructor ahead of time, unless it is truly an emergency (in that case, appropriate supporting documents are required). Otherwise, you'll receive 0 for the specific item.

Choice 1: Generative AI is not permitted in this course.

The use of any form of Generative AI (e.g., ChatGPT, iA Writer, DALL-E) is not permitted in this course. The assignments have been designed to ensure that you develop and demonstrate the knowledge and skills associated with the learning outcomes laid out in the syllabus. Because generative AI tools and detection software are developing at a rapid pace, it is possible that assignments you turn in might appear as "false positives" and raise concerns of possible academic dishonesty. To ensure that you can demonstrate intellectual ownership of the assignments you submit, you are therefore encouraged to maintain clear evidence of your work (e.g., time-stamped drafts and notes; copies and links to source material). Any violation of these rules will be treated at the undergraduate level within the SMU Student Honor Code and at the graduate and professional level within the honor codes found in their respective school policies. If there is sufficient cause for concern, an incident report will be submitted for review by the Office of Student Conduct and Community Standards.

Title IX and Disability Accommodations

Disability Accommodations

Students who need academic accommodations for a disability must first register with Disability Accommodations & Success Strategies (DASS). Students can call 214-768-1470 or visit smu.edu/DASS to begin the process. Once they are registered and approved, students then submit a DASS Accommodation Letter through the electronic portal, *DASS Link*, and then communicate directly with each of their instructors to make appropriate arrangements. Please note that accommodations are not retroactive, but rather require advance notice in order to implement.

Sexual Harassment

All forms of sexual harassment, including sexual assault, dating violence, domestic violence and stalking, are violations of SMU's Title IX Sexual Harassment Policy and may also violate Texas law. Students who wish to file a complaint or to receive more information about the grievance process may contact Samantha Thomas, SMU's Title IX Coordinator, at accessequity@smu.edu or 214-768-3601. Please note that faculty and staff are mandatory reporters. If students notify faculty or staff of sexual harassment, they must report it to the Title IX Coordinator. For more information about sexual harassment, including resources available to assist students, please visit smu.edu/sexualharassment.

Pregnant and Parenting Students

Under Title IX, students who are pregnant or parenting may request academic adjustments by contacting the Office of Student Advocacy and Support by calling 214-768-4564. Students seeking assistance must schedule an appointment with their professors as early as possible, present a letter from the Office of the Dean of Students, and make appropriate arrangements. Please note that academic adjustments are not retroactive and, when feasible, require advance notice to implement.

Academic Policies

Religious Observance

Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. Click here for a list of holidays.

Medical-Related Absences

To ensure academic continuity and avoid any course penalties, students should follow procedures described by their instructors in order to be provided with appropriate modifications to assignments, deadlines, and exams.

Excused Absences for University Extracurricular Activities

Students participating in an officially sanctioned, scheduled university extracurricular activity should be given the opportunity to make up class assignments or other graded assignments that were missed as a result of their participation. It is the responsibility of the student to make arrangements for make-up work with the instructor prior to any missed scheduled examinations or other missed assignments. (See current Catalog under heading of "Academic Records/Excused Absences.")

Final Exams

Final course examinations shall be given in all courses where appropriate, and some form of final assessment is essential. Final exams and assessments must be administered as specified in the official examination schedule and cannot be administered or due during the last week of classes or during the Reading Period. Syllabi must state clearly the form of the final exam or assessment, and the due date and time must match the official SMU exam schedule. SMU policy states that all exceptions to the examination schedule may be made only upon written recommendation of the

chair of the department sponsoring the course and with the concurrence of the dean of that school, who will allow exceptions only in accordance with guidelines from the Office of the Provost.

Academic Dishonesty

Students are expected to embrace and uphold the SMU Honor Code. Violations of the Honor Code will be acted upon in accordance with the policies and procedures outlined in the Mustang Student Handbook.

Student Support Services

Student Academic Success Programs

Students needing assistance with writing assignments for SMU courses may schedule an appointment with the Writing Center through Canvas. Students who would like support for subject-specific tutoring or success strategies should contact SASP, Loyd All Sports Center, Suite 202; 214-768-3648; smu.edu/sasp. Tutor schedules are available at smu.edu/tutorschedule.

Caring Community Connections Program

CCC is a resource for anyone in the SMU community to refer students of concern to the Office of the Dean of Students. The online referral form can be found at smu.edu/deanofstudentsccc. After a referral form is submitted, students will be contacted to discuss the concern, strategize options, and be connected to appropriate resources. Anyone who is unclear about what steps to take if they have concerns about students should contact the Office of the Dean of Students at 214-768-4564.

Mental Health Resources: Counseling Services and Teletherapy

Throughout the academic year, students may encounter different stressors or go through life experiences which impact their mental health and academic performance. Students who are in distress or have concerns about their mental health can schedule a same-day or next-day appointment to speak with a counselor by calling Counseling Services. Counselors are available at any time, day or night for students in crisis at this number: 214-768-2277 (then select option 2) They will be connected with a counselor immediately. Students seeking ongoing counseling should call the same number (214-768-2277, then select option 1) during normal business hours to schedule an initial appointment. SMU Teletherapy provides another free option for on-demand counseling and video appointments with a medical professional.

Campus Carry Law

In accordance with Texas Senate Bill 11, also known as the ‘campus carry’ law, and following consultation with entire University community, SMU chooses to remain a weapons-free campus. Specifically, SMU prohibits possession of weapons (either openly or in a concealed manner) on campus. For more information, please see: smu.edu/campuscarrylaw.

Course Schedule

A rough tentative schedule/sequence:

- introduction and overview of all the course contents (3 weeks)
- testing (7 weeks)
- other QA activities/techniques (2 weeks)
- quality measurement/analysis/improvement (2 weeks)

A more detailed course schedule is available at the course website at: s2.smu.edu/~tian/class/7314.23f.