

CS 439-539

Software Verification and Validation

Lecture Hours: Mondays 13:40 – 14:30 (online)
Tuesdays 08:40 – 10:30 (online)

Zoom <https://sabanciuniv.zoom.us/j/98762233117?pwd=UlkwZFJlVVVsTjY1TmZRcy85dkMwUT09>
(for both the online lectures and instructor's office hours)

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Office Hours: Tuesdays 14:40 – 16:30 (online)

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LEARNING OUTCOMES

Upon successful completion of the course students will be able to:

1. Describe, discuss, and apply concepts, methods, strategies, and techniques related to software verification and validation
2. Understand different testing techniques and have experience in developing test suites and evaluating test suite coverage
3. Have experience with testing frameworks and testing tools

CONTENT

This course covers some of the fundamental concepts, methods, strategies, and techniques related to software verification and validation. Topics included are: Software testing concepts, issues, and principles; boundary value testing; equivalence class testing; decision table-based testing; test coverage metrics; unit testing and test-driven development, path testing; control and data flow testing; usage-based statistical testing; integration testing; combinatorial testing; model-based testing; regression testing; static and dynamic program analysis; formal methods; software inspections and walkthroughs; continuous integration; problem analysis and reporting; and program debugging.

TENTATIVE PROGRAM

week 1	Overview
week 2	Testing Concepts, Issues, and Principles
week 3	Functional Testing
week 4	Combinatorial Testing
week 5	Structural Testing 1
week 6	Structural Testing 2
week 7	Model Based Testing
week 8	Other Types of Testing
week 9	Software Inspections & Walkthroughs
week 10	Static Analysis
week 11	Dynamic Analysis
week 12	Continuous Integration
week 13	Problem Analysis, Reporting, and Debugging

TEXTBOOK

Foundations of Software Testing (2nd Edition), Aditya P. Mathur, Pearson, 2013, ISBN 978-8-131-79476-0.

SUPPLEMENTAL MATERIALS

Software Testing and Analysis: Process, Principles, and Techniques, Mauro Pezze and Michal Young, Wiley, 2008, ISBN 978-0-471-45593-6.

Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement, Jeff Tian, Wiley, 2005, ISBN 978-0-471-71345-6.

Software Testing: A Craftsman's Approach (4th Edition), Pual C. Jorgensen, CRC Press, 2014, ISBN 978-1-466-56068-0.

TENTATIVE GRADING POLICY

	Contribution (%)
Short Quizzes	10
Midterm	20
Final	20
Project	50

Be aware that getting good grades in the exams is not sufficient to pass the course! To be assessed as successful, students must submit all of the assignments and must make a good faith effort to complete all the requirements. This, though, does not mean that the assignments will be graded on the basis of the amount of effort you put in them.

COURSE PROJECT

Projects can be carried out in teams of up to 4 students (except for the graduate students, who can team up with at most one another graduate student).

ATTENDANCE

The instructor will not always stick to the textbooks. To this end, it's a fair game for the instructor to have questions in the exams about any topic discussed in the class. Furthermore, weekly quizzes will be carried during the lecture hours. Therefore, miss a lecture at your own risk!

TURN-IN and LATENESS POLICY

All assignments, such as project progress demos and reports, are due 11:55pm on their due dates. 10% penalty will be incurred for each day of overtime. Submissions that are late by more than 3 days will not get any credits.

COLLABORATION POLICY

Plagiarism (copying/cheating) will be dealt with extreme prejudice.

MAKEUP POLICY

No makeups for the short quizzes! The average of the best $n-2$ quiz grades will be used as the final quiz grade, where n is the total number of quizzes.

If you miss an exam, no makeup exams will be granted unless you have a documented emergency situation and notify the instructor within 48 hours after the exam date. The instructor reserves the right as to when and how a makeup exam will be granted.