



East West University
Department of Computer Science and Engineering
Course Outline
Spring 2024 Semester

Course Information

Course: CSE 430 Software Testing and Quality Assurance (Section 1 and 2)

Credits and Teaching Scheme

	Theory	Laboratory	Total
Credits	3	1	4
Contact Hours	3 Hours/Week for 13 Weeks + Final Exam in the 14 th Week	2 Hours/Week for 13 Weeks	5 Hours/Week for 13 Weeks + Final Exam in the 14 th Week

Prerequisite: CSE412 Software Engineering

Instructor Information

Instructor : Anika Tabassum
Lecturer, Department of Computer Science and Engineering
East West University, Bangladesh.
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Class Routine and Office Hour

Day	08:30 - 10:00	10:10 - 12:10	11:50 – 1:20
Sunday (S)	CSE430 (2) AB3-801	CSE430 Lab (1) 630	Office Hour
Monday (M)	CSE430 (1) AB1-201	Office Hour	CSE347 (3) AB3-701
Tuesday (T)	CSE430 Lab (2) 630 08:00 - 10:00	Office Hour	Office Hour
Wednesday (W)	CSE430 (2) AB3-801	CSE347 Lab (3) 434	Office Hour
Thursday (R)	CSE430 (1) AB1-201	Office Hour	CSE347 (3) AB3-701

Course Objective

The course is designed to enable a clear understanding and knowledge of the software testing and quality control. It explains different SQA components, techniques and standards participated as a part of software project management in the industry.

Besides the concepts, it will build the capacity of reviewing, planning and design the test cases based on system requirements. It will develop the ability to use difference testing techniques (black box and white box) and available tools used in the real-life software projects.

Knowledge Profile

K1 (Theory-based natural sciences): A systematic, theory-based understanding of the natural sciences applicable to the discipline.

K2 (Conceptually-based mathematics, numerical analysis, statistics, and formal aspects of computer and information science): Conceptually based mathematics, numerical analysis, statistics and the formal aspects of computer and information science to support analysis and modeling applicable to the discipline.

K3 (Theory-based engineering fundamentals): A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

K4 (Forefront engineering specialist knowledge for practice): Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

K5 (Engineering design): Knowledge that supports engineering design in a practice area.

K6 (Engineering practice (technology)): Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

K7 (Comprehension of engineering in society): Comprehension of the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the engineer's professional responsibility to public safety; the impacts of engineering activity; economic, social, cultural, environmental and sustainability.

K8 (Research literature): Engagement with selected knowledge in the research literature of the discipline.

Learning Domains

Cognitive - C2: Understanding, C3: Applying, C4: Analyzing, C5: Comparing C6: Creating

Psychomotor - P2: Manipulation, P3: Precision

Affective - A2: Responding, A3-Valuing

Program Outcomes (POs)

PO1: Engineering Knowledge (Cognitive)

PO2: Problem Analysis (Cognitive)

PO3: Design/Development of Solutions (Cognitive, Affective)

PO4: Investigation (Cognitive, Psychomotor)

PO5: Modern Tool Usage (Cognitive, Psychomotor)

PO6: The Engineer and Society (Affective, Cognitive)

PO7: Environment and Sustainability (Affective, Cognitive)

PO8: Ethics (Affective, Cognitive)

PO9: Individual Work and Teamwork (Psychomotor, Affective)

PO11: Project Management and Finance (Cognitive, Psychomotor)

Complex Engineering Problem Solving

EP1 (Depth of knowledge required): Cannot be resolved without in-depth engineering knowledge at the level of one or more of K3, K4, K5, K6, or K8 which allows a fundamental-based, first principles analytical approach.

EP2 (Range of conflicting requirements): Involve wide-ranging or conflicting technical, engineering and other issues.

EP3 (Depth of analysis required): Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models.

EP4 (Familiarity of issues): Involve infrequently encountered issues.

EP5 (Extent of applicable codes): Are outside problems encompassed by standards and codes of practice for professional engineering.

EP6 (Extent of stakeholder involvement and conflicting requirements): Involve diverse groups of stakeholders with widely varying needs.

EP7 (Interdependence): Are high level problems including many component parts or sub-problems.

Complex Engineering Activities

EA1 (Range of resources): Involve the use of diverse resources (for this purpose, resources include people, money, equipment, materials, information and technologies).

EA2 (Level of interaction): Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues.

EA3 (Innovation): Involve creative use of engineering principles and research-based knowledge in novel ways.

EA4 (Consequences for society and the environment): Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation.

EA5 (Familiarity): Can extend beyond previous experiences by applying principle-based approaches.

Course Outcomes (COs) with Mappings

After completion of this course students will be able to:

CO	CO Description	PO	Learning Domains	Knowledge Profile	Complex Engineering Problem Solving/ Engineering Activities
C01	Understand and analyze different software quality assurance and quality control activities and standards for software projects.	PO2	C3, C4	K1-K4	EP1, EP2
C02	Understand and analyze review and inspection techniques and formulate appropriate test plan and design test cases based on system specifications.	PO3	C3, C4	K5	EP1, EP2

C03	Use and examine different software testing techniques; Apply and examine automated testing tools; Apply and identify appropriate testing for real-life complex software projects.	P05	C3, C4	K6	EP1, EP2
C04	Demonstrate, adapt, apply software testing skills in real-life complex software projects; justify and compare software testing techniques for optimized quality control.	P09	C5, C6, P2, P3, A2, A3		EA1, EA2

Course Topics, Teaching-Learning Method, and Assessment Scheme

Course Topic	Teaching-Learning Method	CO	Mark of Cognitive Learning Levels		CO Mark	Exam (Mark)
			C3	C4		
Software Quality, Quality Assurance & Quality Control; Quality Assurance activities; Quality standards; quality factors; The components of the SQA;	Lecture, Class Discussion, Discussion outside class with Instructor	C01	5	5	10	

Midterm Exam
(30)

<p>Review and inspections, Formal technical reviews, Cost estimations of review tasks, Software testing life cycle (STLC), Software test plan preparation, Test case design and analysis.</p> <p>Test plan format;</p> <p>Pairwise testing; AllPair Testing; Data Coverage; Decision Table; Boundary Value Analysis; Control flow testing, Data flow testing, Domain Testing, Functional Testing</p>	Do	CO2	10	10	20	
<p>Software Testing objectives and strategies; software test classifications: white box testing & black box testing; Acceptance, unit testing; NUNIT selenium; Integration testing.</p> <p>Product Metrics; Analyzing software quality activities; evaluating cost of software quality (COQ) and quality level</p>	Do	CO3	15	15	30	Final Exam (30)

Laboratory Experiments and Assessment Scheme

Experiment	Teaching-Learning Method	CO	Mark of Cognitive Learning Levels		Mark of Psychomotor Learning Levels		Mark of Affective Learning Levels		CO Mark
			C5	C6	P2	P3	A2	A3	
Lab Exercise Total	Designing and analyzing test cases, Evaluation of Project Progress	CO4		2				1	3
Lab Exam	Individual Lab Exam and VIVA	CO4		3	1	1	1	1	7
Total									10

Mini Project

Mini Project	Teaching-Learning Method	CO	Mark of Cognitive Learning Level		Mark of Psychomotor Learning Levels		Mark of Affective Learning Level		CO Mark
			C5	C6	P2	P3	A2	A3	
Lab-based Mini Project including Report and Presentation	Group-based, moderately complex Testcase analysis & Design Report, and oral presentation and VIVA on project	CO 4		7	2	2	2	2	15

Overall Assessment Scheme

Assessment Area	CO Marks				PO Marks			
	CO 1	CO 2	CO 3	CO4	PO 2	PO 3	PO5	PO9
Assignments/Presentations		5				5		
Class Test/Quiz	5		5		5	5		
Midterm Exam	10	20			10	20		
Final Exam			30				30	
Laboratory Performance and Lab Exam				10				10
Mini Project				15				15
Total	15	25	35	25	15	30	30	25

Teaching Materials/Equipment

Text books:

1. Software Testing and Quality Assurance: Theory and Practice (1st Edition) by Priyadarshi Tripathy and Kshirasagar Naik
2. *Software testing: Principles and Practices* by Naresh Chauhan, Oxford University Press 2010

Teaching-Learning Method:

Lectures, guest lectures, classroom discussions, assignments, examinations, term project, and lab work.

Mini Project Description:

Mini Project description will be provided in Google Classroom

Equipment/Software: Selenium, Eclipse, JUnit

Notes:

- **Late report submission will suffer a penalty rate of 20% per day, up to 5 days (weekends count towards the 5 days).** Report submissions that are more than 5 days late are penalized by 100%.
- Project must be done in group of 3.
- **STRICTLY NO COPYING** from others.

Grading System

Marks (%)	Letter Grade	Grade Point	Marks (%)	Letter Grade	Grade Point
80-100	A+	4.00	55-59	B-	2.75
75-79	A	3.75	50-54	C+	2.50
70-74	A-	3.50	45-49	C	2.25
65-69	B+	3.25	40-44	D	2.00
60-64	B	3.00	Below 40	F	0.00

Exam Dates

Based on academic calendar.

Academic Code of Conduct**Academic Integrity:**

Any form of cheating, plagiarism, personification, falsification of a document as well as any other form of dishonest behavior related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties as decided by the Disciplinary Committee of the university.**

Special Instructions:

- Students are expected to attend all classes and examinations. A student **MUST** have at least 80% class attendance to sit for the final exam.
- Students will not be allowed to enter into the classroom after 20 minutes of the starting time.
- For plagiarism, the grade will automatically become zero for that exam/assignment.
- Normally there will be **NO make-up exam**. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student misses any exam, the student **MUST** get approval of makeup exam by written application to the Chairperson through the Course Instructor **within 48 hours** of the exam time. Proper

supporting documents in favor of the reason of missing the exam have to be presented with the application.

- For **final exam**, there will be NO makeup exam. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student misses the final exam, the student **MUST** get approval of **Incomplete Grade** by written application to the Chairperson through the Course Instructor **within 48 hours** of the final exam time. Proper supporting documents in favor of the reason of missing the final exam have to be presented with the application. **It is the responsibility of the student to arrange an Incomplete Exam within the deadline mentioned in the Academic Calendar in consultation with the Course Instructor.**
- All mobile phones **MUST** be turned to silent mode during class and exam period.
- There is **zero tolerance for cheating** in exam. Students caught with cheat sheets in their possession, whether used or not; writing on the palm of hand, back of calculators, chairs or nearby walls; copying from cheat sheets or other cheat sources; copying from other examinee, etc. would be treated as cheating in the exam hall. The only penalty for cheating is **expulsion for several semesters as decided by the Disciplinary Committee of the university.**