Department of Computer Engineering

Program: Scheme	
Course Name: Software Testing and Analysis Lab **Subject Code: CELDLO7051**	**Year & Sem:** BE-VII **Practical:** 02 hours
Faculty: Dr. Vivek Khalane Ms. Pallavi H. Chitte	**Academic Year:** 2023-24(Odd)

Course Objectives:

1. To explore and apply of the basic concepts and techniques used in software testing, including test planning,

test cases, test coverage, and test automation.
2. Understanding of software quality and the importance of testing in ensuring quality software
3. To develop practical testing skills by working on real-world testing projects
4. To develop skills in software test automation and management using latest tools

Course Outcomes Lab:

At the end of the course learner will be able to

CO1: To develop effective and comprehensive defect reports.
CO2: To develop effective test plans and test cases.
CO3: To perform black-box and white-box testing for given problem statement.
CO4: To apply unit testing or alpha beta testing approaches for a given software component.
CO5: To apply different types of software development metrics and quality management tools.
CO6: To apply software management tool to monitor & control the software development.

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Program Outcomes:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

P10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

P11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

P12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Mapping of Course outcomes with Program outcomes:

Subject Weight		Course Outcomes	Contribution to Program outcomes PO'S											
			1	2	3	4	5	6	7	8	9	10	11	12
THEORY 20%	CO1	To develop effective and comprehensive defect reports.	2	3	1	1	1			1	1		1	
	CO2	To develop effective test plans and test cases.	2	2	2	1	1		1	1				
	CO3	To perform black-box and white-box testing for given problem statement.	1	2	1	1	1		1	1	1		1	
	CO4	To apply unit testing or alpha beta testing approaches for a given software component.	2	1	2	1	1		1				2	
	CO5	To apply different types of software development metrics and quality management tools.	2	2	1	1	1				1		2	
	CO6	To apply software management tool to monitor & control the software development.	1	2	2	1	1		1	1	1			
PRACTICAL 80%	CO1	To develop effective and comprehensive defect reports.	1	2	2	1	1		1	1		1	1	
	CO2	To develop effective test plans and test cases.	1	2	1	1	1	1	1	1	1	1		
	CO3	To perform black-box and white-box testing for given problem statement.	1	1	1	1	1		1	1	1	1		1
	CO4	To apply unit testing or alpha beta testing approaches for a given software component.	1		2	1	1		1		1	1	1	1
	CO5	To apply different types of software development metrics and quality management tools.	1	1	1	1	1	1	1		1	1	1	
	CO6	To apply software management tool to monitor & control the software development.	1	1	1	1	1	1	1	1	1		1	

Program Specific Outcomes:

PSO1: To build competencies towards problem solving with an ability to understand, identify, analyze and design the problem, implement and validate the solution including both hardware and software.

PSO2: To build appreciation and knowledge acquiring of current computer techniques with an ability to use skills and tools necessary for computing practice.

PSO3: To be able to match the industry requirements in the area of computer science and engineering. To equip skills to adopt and imbibe new technologies.

Mapping of Course outcomes with Program Specific Outcomes:

Course Outcomes		Contribution to Program Specific outcomes		
		PSO1	**PSO2**	**PSO3**
CO1	To develop effective and comprehensive defect reports.	1	2	1
CO2	To develop effective test plans and test cases.	2	2	1
CO3	To perform black-box and white-box testing for given problem statement.	1	1	2
CO4	To apply unit testing or alpha beta testing approaches for a given software component.	1	1	1
CO5	To apply different types of software development metrics and quality management tools.	1	2	2
CO6	To apply software management tool to monitor & control the software development.	1	1	2

CO Weightage

Course Outcomes	Weightage (in %)
CO1: To develop effective and comprehensive defect reports.	01 Exp – 10%
CO2: To develop effective test plans and test cases.	01 Exp – 10%
CO3: To perform black-box and white-box testing for given problem statement.	03 Exp - 30%
CO4: To apply unit testing or alpha beta testing approaches for a given software component.	01 Exp - 10%
CO5: To apply different types of software development metrics and quality management tools.	02 Exp – 20%
CO6: To apply software management tool to monitor & control the software development.	02 Exp - 20%

Experiment List

Experiment No.	Topic	CO Meet	Weightage (in %)
1.	Take any system (e.g., ATM system) and study its system specifications and report the various bugs.]	CO1	10
2.	Develop a test plan and test cases for any of given case study 1. Web-Based Library Management System, 2. 2. Online Shopping Cart System, 3. Mobile Weather App 4. To-Do List Application	CO2	10
3.	To perform Boundary Value Testing for a Banking Application (Identifying Boundary Condition Defects in Account Balance Calculation)	CO3	03
4.	Derive test cases based on decision-table approach, for triangle problem given below and execute the test cases. Accept three integers which are supposed to be the three sides of triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all.	CO3	03
5.	Determine the basis paths for Quicksort algorithm and derive different test cases, execute these test cases.	CO3	04
6.	To develop and execute alpha, beta testing for a given software component	CO4	10
7.	To develop and implement a software quality assurance plan for a given software system	CO5	10
8.	To utilize Git and GitHub as version control tools to manage the source code, track changes, and facilitate collaboration in a software development project.	CO5	10
9.	Develop and implement automated test scripts for a software application using Selenium.	CO6	05
10.	Study of any Testing Tool (e.g., WinRunner)	CO6	05

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Lab Coverage

Experiment No.	Topic	CO Meet	Batchwise Dates
1.	Take any system (e.g., ATM system) and study its system specifications and report the various bugs	CO1	

2.	Develop a test plan and test cases for any of given case study
	   1. Web-Based Library Management System,
	   2. 2. Online Shopping Cart System,
	   3. Mobile Weather App
	   4. To-Do List Application
		CO2	

3.	To perform Boundary Value Testing for a Banking Application (Identifying Boundary Condition Defects in Account Balance Calculation)	CO3	
4.	**Derive test cases based on decision-table approach, for triangle problem given below and execute the test cases.** Accept three integers which are supposed to be the three sides of triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all.	CO3	
5.	Determine the basis paths for Quicksort algorithm and derive different test cases, execute these test cases.	CO3	
6.	To develop and execute alpha, beta testing for a given software component.	CO3	
7.	To develop and implement a software quality assurance plan for a given software system.	CO4	
8.	To utilize Git and GitHub as version control tools to manage the source code, track changes, and facilitate collaboration in a software development project.	CO5	
9.	Develop and implement automated test scripts for a software application using Selenium.	CO6	
10.	Study of any Testing Tool (e.g., WinRunner)	CO6	

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