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SOFTWARE TESTING **Course Code : 316314**

Programme Name/s	**: Computer Technology/ Computer Engineering/ Computer Software Technology/ Computer Science & Engineering/ Computer Hardware & Maintenance/ Computer Science & Information Technology/ Computer Science**
Programme Code	**: CM/ CO/ CST/ CW/ HA/ IH/ SE**
Semester	**: Sixth**
Course Title	**: SOFTWARE TESTING**
Course Code	**: 316314**

I. RATIONALE

This curriculum teaches software testing methods, including manual and automation testing, performance, and security testing. With the growing demand for skilled testers in various development organizations, this course prepares students for industry roles as software tester. Hands-on experience with tools like Selenium helps them apply their knowledge and skill effectively. By completing this course, students gain valuable skills for career in software quality assurance.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Develop strong testing skills along with proficiency in tools like Selenium to ensure software quality.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Explain various software testing methods.
- CO2 - Prepare test cases for different levels of testing.
- CO3 - Prepare test plan for a given application.
- CO4 - Create defect report for a given application.
- CO5 - Apply automation testing tools to test software.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Assessment Scheme											
				Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TL				Based on SL		Total Marks
															Practical						
				CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
											Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
316314	SOFTWARE TESTING	SFT	DSC	3	-	4	1	8	4	3	30	70	100	40	25	10	-	-	25	10	150

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Total IKS Hrs for Sem. : Hrs
Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment
Legends: @ Internal Assessment, # External Assessment, *# On Line Examination , @$ Internal Online Examination
Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Identify errors and bugs in the given program. TLO 1.2 Explain the Entry and Exit Criteria for the given test application. TLO 1.3 Explain various types of Software Testing methods.	**Unit - I Software Testing and Testing Methods** 1.1 Software Testing, Objectives of Testing, Software Requirement Specification (SRS) 1.2 Failure, Error, Fault, Defect, Bug Terminology 1.3 Test Case, Entry and Exit Criteria for Testing 1.4 Methods of Testing: Static and Dynamic Testing 1.5 White Box Testing: Inspections, Walkthroughs, Technical Review, Functional Testing, Code Coverage Testing, Code Complexity Testing 1.6 Black Box Testing: Requirement Based Testing, Boundary Value Analysis and Equivalence Partitioning	Lecture Using Chalk-Board Presentations Video Demonstrations
2	TLO 2.1 Apply the concepts of unit testing. TLO 2.2 Explain different integration testing strategies. TLO 2.3 Apply the principles and methods of system testing. TLO 2.4 Explain the purpose and process of acceptance testing. TLO 2.5 Apply various special testing techniques. TLO 2.6 Prepare test case for the given application.	**Unit - II Types and Levels of Testing** 2.1 Unit Testing: Driver, Stub 2.2 Integration Testing: Top-Down Integration, bottom-Up Integration, Bi-Directional Integration 2.3 System Testing 2.4 Acceptance Testing: Alpha, Beta Testing 2.5 Special Testing: Performance Testing-Load Testing and Stress Testing, Regression Testing, Security Testing, Client-Server Testing, GUI Testing, Database Testing, Sanity and Smoke Testing	Lecture Using Chalk-Board Presentations Video Demonstrations

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Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
3	TLO 3.1 Prepare test plan and test cases for the given application. TLO 3.2 Apply test infrastructure and people management strategies. TLO 3.3 Identify base lining of test plans. TLO 3.4 Prepare test report of executed test cases for the given application.	**Unit - III Test Management** 3.1 Test life cycle 3.2 Test Planning: Preparing a Test Plan, Deciding the Test Approach, Setting Up Criteria for Testing, Identifying Responsibilities, Staffing, Resource Requirements, Test Deliverables, Testing Tasks 3.3 Test Management: Test Infrastructure Management, Test People Management 3.4 Test Process: Base Lining a Test Plan, Test Case Specification 3.5 Test Reporting: Executing Test Cases, Preparing Test Summary Report	Lecture Using Chalk-Board Presentations Video Demonstrations
4	TLO 4.1 Classify defects on the basis of estimated impact. TLO 4.2 Prepare defect template for the given application. TLO 4.3 Explain defect management process on the given application.	**Unit - IV Defect Management** 4.1 Defect Classification, Defect Management Process 4.2 Defect Life Cycle, Defect Template 4.3 Estimate Expected Impact of a Defect, Techniques for Finding Defects, Reporting a Defect	Lecture Using Chalk-Board Presentations Video Demonstrations
5	TLO 5.1 Identify different testing tools to test the given application. TLO 5.2 Improve testing efficiency using automated tool for given application. TLO 5.3 Apply testing tool to test the given application. TLO 5.4 Describe Metrics and Measurement for the given application.	**Unit - V Testing Tools and Measurements** 5.1 Manual Testing verses Automation Testing, advantages and disadvantages of using Testing Tools 5.2 Selecting a Test Tool: Criteria for Selecting Test Tools, Steps for Tool Selection and Deployment 5.3 Selenium: Introduction and Components, Automation Testing Tools 5.4 Selenium IDE: Introduction, Features, Limitations 5.5 Selenium WebDriver: Introduction, advantages and disadvantages 5.6 Metrics and Measurement: Types of Metrics, Product Metrics and Process Metric	Lecture Using Chalk-Board Presentations Video Demonstrations

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Write test cases for purchase management system.	1	*Design test cases for purchase order management based on system specification	2	CO1
LLO 2.1 Write test cases for Inventory management System.	2	*Design test cases for Inventory management System based on System Specification	2	CO1
LLO 3.1 Write test cases for simple calculator application.	3	Design test cases for calculator to verify its functionality (Black Box Testing)	2	CO1

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Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 4.1 Write test cases for hostel admission form.	4	Design test cases for hostel admission form	2	CO1
LLO 5.1 Write test cases for different tasks (OTP Verification, Image Upload) in any software module using equivalence partitioning and boundary value analysis of black box testing.	5	*Design test cases for different tasks (OTP Verification, Image Upload) in any software module using black box testing	2	CO1
LLO 6.1 Write test cases for railway reservation System.	6	Test various functionality of railway reservation system	2	CO2
LLO 7.1 Prepare test cases for e-commerce login form.	7	*Validate login procedure for E-Commerce Application (Flipkart or Amazon)	2	CO2
LLO 8.1 Write test cases for web page testing any web site.	8	Test functionality of Web Pages of any website	2	CO2
LLO 9.1 Write program and design test cases for-For...Loop. LLO 9.2 Write program and design test cases for-Do...While Loop. LLO 9.3 Write program and design test cases for-Switch Case. LLO 9.4 Write program and design test cases for-if...else.	9	*Design Test Cases for Control and Decision Making Statements (Use C Language)	2	CO2
LLO 10.1 Prepare test cases for online mobile recharge.	10	*Design test cases for online mobile recharge	2	CO2
LLO 11.1 Prepare test cases for flight ticket booking system.	11	*Design test cases for flight ticket booking system	2	CO2
LLO 12.1 Write test plan and test cases for elevator.	12	Design test plan and cases for elevator	2	CO3
LLO 13.1 Write test plan and test cases for Notepad Application.	13	*Design test plan and test cases for Notepad (MS Window based) Application	2	CO3
LLO 14.1 Create test report of executed test cases for any website.	14	Prepare test report for any website	2	CO3
LLO 15.1 Prepare test cases and test summary report for a travel booking application.	15	*Design test cases and test summary report for a travel booking application	2	CO3
LLO 16.1 Write test plan and test cases for the login functionality of a social media application.	16	*Design test plan and test cases for the login functionality of a social media application	2	CO3
LLO 17.1 Prepare defect report after executing test cases for library management system.	17	*Generate Defect Report for Library Management System	2	CO4
LLO 18.1 Prepare defect report after executing test cases for withdrawn of amount from ATM Machine.	18	*Validate Defect Report for ATM Machine	2	CO4
LLO 19.1 Prepare defect report after executing test cases for any login form.	19	Execute Test Cases to Generate Defect Report for any login form	2	CO4
LLO 20.1 Prepare defect report after executing test cases for hostel admission form.	20	Defect Report for Hostel Admission Form	2	CO4

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 21.1 Install and configure Selenium IDE to apply automation testing concepts.	21	*Installation and Configuration of Selenium IDE.	2	CO5
LLO 22.1 Write and run test cases for Notepad using Selenium IDE.	22	*Test Case Design and Execution for Notepad (Windows-Based) Using Selenium IDE	4	CO5
LLO 23.1 Write and run test cases for MS Word application using Selenium IDE.	23	Test Case Design and Execution for MS Word application using Selenium IDE	4	CO5
LLO 24.1 Install and configure Selenium WebDriver to apply automation testing concepts.	24	*Installation and Configuration of Selenium WebDriver	2	CO5
LLO 25.1 Apply browser automation techniques using Selenium WebDriver to automate tasks such as opening a URL, navigating, and closing.	25	*Browser Automation with WebDriver	4	CO5
LLO 26.1 Apply techniques to automate switching between multiple browser windows or tabs using Selenium WebDriver.	26	Handling Multiple Windows and Tabs in WebDriver	4	CO5

Note : Out of above suggestive LLOs -

- '*' Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)

Micro project

- Test the checkout process in an online clothing store.
- Validate the functionality of a product search feature in an electronics e-commerce site.
- Validate the functionality of a weather API in a mobile app.
- Evaluate the performance of a login page under different user loads.
- Validate the accuracy of patient data in a hospital management system.
- Any micro project topic suggested by faculty on similar line.

Other

- Complete the Software Testing course NPTEL Platform.
- Complete the Software Testing Fundamentals course Infosys Springboard.

Assignment

- Explain various types of Software Testing methods.
- Draw defect prevention process cycle. State working of each phase.
- Design test cases for online mobile recharge.
- Differentiate between Smoke Testing and Sanity Testing.
- Describe need for automation testing tools.

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Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- For courses with no SLA component the list of suggestive microprojects / assignments/ activities are optional, faculty may encourage students to perform these tasks for enhanced learning experiences.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Selenium (IDE and WebDriver)	21,22,23,24,25,26
2	Computer System with processor i3 and above, RAM minimum 4 GB	All
3	Spreadsheet Package (Microsoft excel)	All
4	Lean software testing tool, Bugzilla, QTP and RTP Software Testing Tool, loadrunner Software Testing Tool, GTMetrix, Notepad (Any Open Source Software Testing Tool)	All

IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Software Testing and Testing Methods	CO1	9	4	6	4	14
2	II	Types and Levels of Testing	CO2	12	6	6	6	18
3	III	Test Management	CO3	9	4	6	4	14
4	IV	Defect Management	CO4	6	2	4	4	10
5	V	Testing Tools and Measurements	CO5	9	4	6	4	14
Grand Total				**45**	**20**	**28**	**22**	**70**

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- The marks of two offline unit tests, each 30 marks, will be considered, and the average of the two unit test marks will be calculated out of 30 marks.
- Each practical will be assessed with 60% weightage given to the process and 40% weightage given to the product.
- The formative assessment of laboratory learning will be of 25 marks.

Summative Assessment (Assessment of Learning)

- End semester examination, Lab performance, Viva voce.

XI. SUGGESTED COS - POS MATRIX FORM

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Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	1	1	-	-	-	-	1			
CO2	1	2	3	1	1	-	1			
CO3	1	2	3	1	1	1	-			
CO4	1	3	1	1	1	-	-			
CO5	-	1	2	3	1	-	-			

Legends :- High:03, Medium:02,Low:01, No Mapping: -
*PSOs are to be formulated at institute level

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	Srinivasan Desikan, Gopalaswamy Ramesh	Software Testing: Principles and Practices	Pearson India, 2016, ISBN: 9788177581218
2	Limaye M. G.	Software Testing: Principles, Techniques and Tools	Tata McGraw Hill Education, New Delhi, 2012, ISBN(13): 9780070139909
3	Chauhan Naresh	Software Testing: Principles and Practices	Oxford University Press, 2016, ISSN: 9780198061847
4	Kalilur Rahman	Science of Selenium Master Web UI Automation and Create Your Own Test Automation Framework	Bpb Publications, 2019, ISBN: 9789389423242, 9389423244
5	Singh Yogesh	Software Testing	Cambridge University Press, 2012, ISBN 978-1-107-65278-1

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013841792861315072425 4_shared/overview	Infosys Springboard - Software Testing Fundamentals course
2	https://www.geeksforgeeks.org/software-testing-basics/	Software Testing Tutorials
3	https://www.w3schools.in/software-testing/tutorials/	Software Testing Tutorials
4	https://www.geeksforgeeks.org/defect-management-process/	Software Testing – Defect Management Process
5	https://www.lambdatest.com/learning-hub/selenium-ide	Introduction to Selenium IDE
6	https://www.geeksforgeeks.org/introduction-to-selenium-webdriver/	Introduction to Selenium WebDriver
7	https://www.geeksforgeeks.org/software-measurement-and-metrics/	Software Testing – Software Measurement and metrics
8	https://nptel.ac.in/courses/106101163	Software Testing Course

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Sr.No	Link / Portal	Description
9	https://nptel.ac.in/courses/106105150	Software Testing Course

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

MSBTE Approval Dt. 04/09/2025 **Semester - 6, K Scheme**