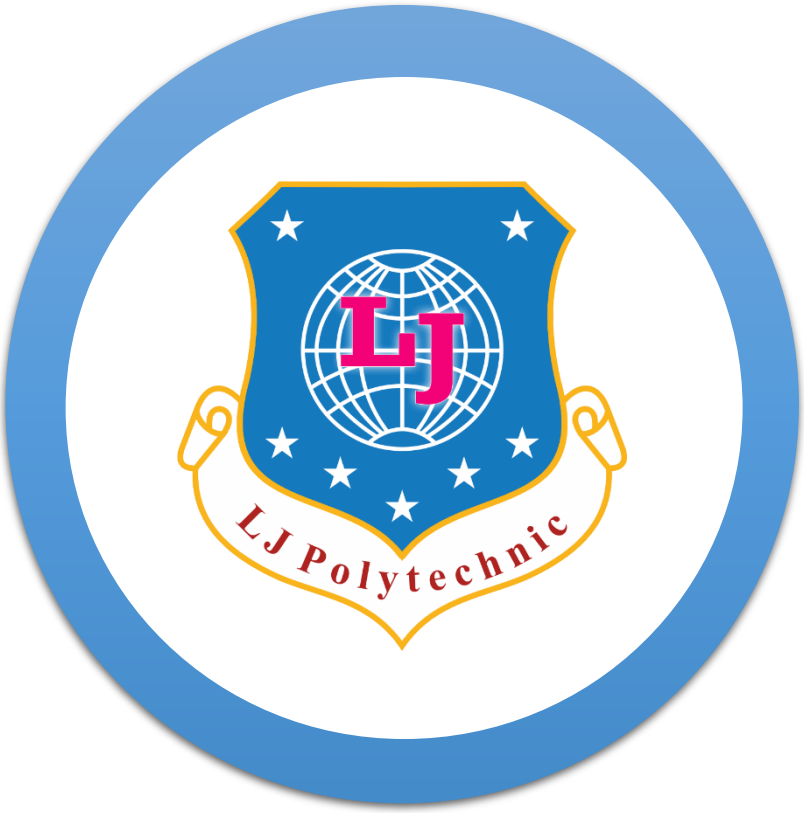
Lok Jagruti Kendra University
University with a Difference

Diploma in Information Technology



Course Code: 025040609

Automated Software Testing

Programme / Branch Name			Diploma in Information Technology			
Course Name	Automated Software Testing				**Course Code**	025040609
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses BSC: Basic Science Courses
ESC: Engineering Science Courses PCC: Program Core Courses
OEC: Open Elective Courses PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week / Credits				Evaluation Scheme			
L	**T**	**P**	**Total Credit**	**CCE**	**SEE (Th)**	**SEE (Pr)**	**TOTAL**
3	0	4	5	50	50	50	150

Legends:
L: Lectures T: Tutorial P: Practical
CCE: Continuous & Comprehensive Evaluation
SEE (Th): Semester End Evaluation (Theory)
SEE (Pr): Semester End Evaluation (Practical)

2. Prerequisites

- ✓ Basic knowledge of Software Testing.
- ✓ Programming and Scripting Knowledge

3. Rationale

This subject will introduce automation testing which will be utilized in students' creativity to explore new ways to test a system. Over the last decade, the Selenium automation tool has gained a lot of popularity in the automation testing world due to its unique features like - multiple operating system support, multiple language support, multiple browsers support, open-source and community support. MNCs to startups, all small and large organizations are investing a lot in automation testing which has raised the demand for automation experts. Almost all job openings of software testing in any part of the world ask for Selenium expertise.

4. Objectives

- ✓ The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.
  - Develop effective test plans that cover all aspects of an application and implement automation testing tools to facilitate efficient and thorough testing.
  - Utilize automation testing tools to create scripts that can be re-used on multiple projects.
  - Use debugging tools to identify and fix software defects.
  - Investigate and analyze software errors and defects.
  - Utilize performance testing to identify and repair application bottlenecks.

5. Contents

Unit No.	Topics	Sub-Topics	Learning Outcomes	% Weightage	Hours
1	**Introduction to Automation Testing**	1.1. Automation Testing Introduction 1.2. Limitations of Manual Testing and Need for Automation Testing 1.3. Features of Test Tools: Selenium WebDriver, Junit 1.4. Guideline for Selecting a Tool 1.5. Static and Dynamic Testing Tools 1.6. Advantages and Disadvantages of Using Tools 1.7. Use Automation Test Tools	• Discover how to improve testing efficiency by automating your test • Test software using automation test tools	20	9
2	**Selenium Automation Tool**	2.1. Introduction 2.2. Installation & Setup 2.3. Selenium Components & Architecture 2.4. Basic Interface of Selenium WebDriver 2.5. Basic WebDriver Methods 2.6. Running First Test Using Selenium WebDriver	• Understanding the different Selenium components and their architecture • To learn basics of WebDriver • Automate a web application on Chrome browser	15	7
3	**Locators, Identifiers and Xpath**	3.1. Importance of Locators 3.2. Identify Web Elements Using Id and Name Locators 3.3. Class Name and CSS Locators 3.4. Different Ways of Writing Xpaths 3.5. Building Customized Xpath and CSS Selector Locator 3.6. Using Unique Tag Names 3.7. Create Xpath From Button Texts 3.8. Find Siblings, Parents and Children Using Xpath	• To understand usage of Locators • Using different Locators • To learn different ways of creating Xpaths • Using CSS selectors, button texts	20	9

			• To understand the Unique Tag Name • Using Xpath from button texts • Learn to find Siblings, Parents and Children using Xpath		
4	**Identify and Automate Web Elements**	4.1. Automate Browser Navigation 4.2. Static Dropdown 4.3. Dynamic Dropdowns 4.4. Parent-Child Relationship Locators 4.5. Checkbox 4.6. End to End Automation	• To understand Automate Browser Navigation • Static & Dynamic dropdown • To understand Parent-Child relationship locators & checkbox • To understand how end to end automation works	25	9
5	**Waits and Mouse Operations**	5.1 Implicit Wait 5.2 Explicit Wait 5.3 When to Use Waits 5.4 Synchronization Using Explicit Wait 5.5 Fluent Wait and Advantages 5.6 Handling Mouse Interactions 5.7 Window Handling	• To understand Implicit Wait & Explicit Wait and when to use Waits • How to synchronize using Explicit Wait • To understand about Fluent Wait and its advantages • To understand	20	8

			mouse interactions handling and window handling		
				Total Hours	**42**

6. List of Practicals / Exercises

The practical/exercises should be properly designed and implemented in an attempt to develop different types of skills so that students can acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

Sr. No.	Practical / Exercises	Key Competency	Hours
1	Installation and setup of Selenium automation tool and setting the executable path of the Selenium WebDriver.	To learn how to install automation tool	2
2	Capture screenshot of test automation with Selenium WebDriver.	To learn how to capture screenshot in Selenium	4
3	Refreshing webpage while automation testing with Selenium WebDriver using driver.refresh() method and actionchains() method.	To learn refreshing webpage automation testing using WebDriver methods	4
4	Open a webpage in a new tab with Selenium WebDriver.	To understand how to open a webpage in Selenium WebDriver	4
5	Saving partial screenshot of a web page with Selenium WebDriver.	To learn how to save partial screenshot using WebDriver method	2
6	Execute JavaScript code in Selenium WebDriver and extracting results of JavaScript code with Selenium WebDriver.	To understand how to execute JavaScript code in Selenium WebDriver	4
7	Handling multiple browser types for automation cross browser testing using Selenium.	To learn automation cross browser	4
8	Locating elements on a web page using CSS locators.	To understand CSS locators	4
9	HTML source of WebElement in Selenium WebDriver.	To learn WebElement in Selenium WebDriver	4
10	Perform mouse over actions in Selenium WebDriver.	To understand mouse over actions	4
11	Closing tabs without closing the browser in Selenium WebDriver.	To learn closing tabs without closing the browser	4
12	Handling drop-down menu and check boxes in a page with Selenium WebDriver.	To understand drop-down menu & check boxes in a page	4
13	Selecting element via CSS selector in Selenium WebDriver.	To learn CSS selector	4

14	Explicit wait for handling different scenarios in Selenium WebDriver.	To understand explicit wait	4
15	Scroll operations in a web page with Selenium WebDriver.	To learn scroll operations	4
		Total Hours	**56**

7. Suggested Specification Table with Hours

Unit No.	Chapter Name	Teaching Hours	Distribution of Topics According to Bloom's Taxonomy					
			R %	U %	App %	C %	E %	An %
1	Introduction to Automation Testing	9	40	30	20	-	5	5
2	Selenium Automation Tool	7	20	30	30	-	15	5
3	Locators, Identifiers and Xpath	9	30	25	25	-	10	10
4	Identify and Automate Web Elements	9	20	20	20	10	15	15
5	Waits and Mouse Operations	8	20	20	30	10	10	10

Legends: R: Remembering U: Understanding
App: Applying C: Creating
E: Evaluating An: Analyzing

8. Textbooks

1) "Selenium Testing Tools Cookbook, 2nd Edition:" Over 90 recipes to help you build and run automation tests for your web applications with Selenium WebDriver-Unmesh Gundecha

9. Reference Books

1) "Software Test Automation"- Mark Fewster, Dorothy Graham
2) "Effective Software Test Automation Developing an Automation Software Testing Tool"- Kanglin Li and Mengqi Wu

10. Open Sources (Website, Video, Movie)

1) https://www.udemy.com/course/selenium-automation-testing-for-beginners/
2) https://www.udemy.com/course/selenium-real-time-examplesinterview-questions/
3) https://www.softwaretestinghelp.com/selenium-tutorial-1/