Ganpat University
॥ विद्यया समाजोत्कर्षः ॥
Faculty of Computer Applications

FACULTY OF COMPUTER APPLICATIONS

Programme	Bachelor of Computer Applications	**Branch/Spec.**	Bachelor of Computer Applications
Semester	V	**Version**	1.0.0.0
Effective from Academic Year	2026-2027	**Effective for the batch Admitted in**	June 2024
Subject Code	U35B5SQA	**Subject Name**	SOFTWARE TESTING AND QUALITY ASSURANCE

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	4		-	-	4	Theory	50	50	100
Hours	4		-	-	4	Practical	-	-	-

Objective:

The objective of this course is to learn Software Testing for good Quality Software, Software Quality Assurance (SQA) architecture and its component, Design, Develop and write Test Plan & Test Cases.

Pre-requisites:

Students should have a good understanding basic knowledge of Design and analysis of software with the use of different tools

Course Outcomes :

Name of CO	Description
CO1	To understand the basic concepts, factors and activities of Software Quality Assurance.
CO2	To know components and activities for quality assurance and project life cycle.
CO3	To analyze the testing methods for assuring quality of software
CO4	To provide skills to design test case plan for testing software to the students.
CO5	Improve organizational software processes through their implementation.
CO6	Understand emerging trends such as AI in testing DevOps and continuous quality integration for industry readiness.

Mapping of CO and PO

Cos	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO11	PO12
CO1	3	1	1	0	2	2	1	3	1	1	1	1
CO2	2	2	3	0	0	1	0	2	1	1	2	1
CO3	2	2	2	3	2	2	2	3	2	3	2	1
CO 4	1	2	2	1	3	2	1	3	2	3	1	1
CO 5	1	2	0	2	3	2	1	3	0	2	3	1
CO 6	0	2	1	2	2	3	2	3	1	2	3	2

Content:		
Unit		**Hrs**
1	**Introduction to software Quality Assurance** The software quality challenge, Software quality, Software quality factors, Management and its role in software quality assurance, SQA activities.	08
2	**Components of SQA** The components of the software quality assurance system overview, Integrating quality activities in the project life cycle, Pre-project Software Quality Components, Contract review, Development and quality plans.	07
3	**Software Testing –Implementation** The Testing Process, Test Case Design, Automated Testing, Testing Life Cycle, Software Quality Implementation, Assuring the quality of software maintenance components, Assuring the quality of external Participants contributions, CASE tools and their effect on software Quality.	12
4	**Software Quality Infrastructure Components (Introduction Only)** Procedures and work instructions, Staff training and certification, Corrective and preventive actions, Documentation control. **Software Quality Metrics** Software Quality metrics, Cost of Quality, Different types of Metrics, Complexity metrics.	12
5	**Advanced Testing Methodologies** **Regression Testing:** Types of regression testing (retest all, selective retest, prioritization), regression test strategies, **Smoke Testing & Sanity Testing:** Distinctions and use cases. **Data Migration Testing:** Strategies for testing data integrity during migration. **Internationalization (I18N) and Localization (L10N) Testing:** Challenges and approaches. **Mobile Application Testing:** Specific challenges (devices, networks, gestures), types of mobile testing. **Cloud-Based Application Testing:**	11

	Considerations for testing in cloud environments. **Agile Testing:** Principles of agile testing, role of testers in agile teams, test-driven development (TDD), behavior-driven development (BDD) overview.	
6	**Test Management and Automation** **Test Planning:** Test plan components (scope, objectives, resources, schedule, risks), IEEE 829 standard. **Test Documentation:** Test cases, test scripts, test reports, traceability matrix. **Defect Management Process:** Defect life cycle, logging, tracking, reporting, severity and priority. **Automated Testing Concepts:** Benefits and challenges of test automation, types of automation frameworks (data-driven, keyword-driven, hybrid). **Introduction to Test Automation Tools:** Overview of popular tools (e.g., Selenium WebDriver, JUnit/NUnit, TestNG). **Continuous Integration (CI) and Continuous Delivery (CD) in Testing:** Role of testing in DevOps pipeline, integrating automated tests with CI/CD tools (e.g. Jenkins, GitLab CI).	10

Practical Content:
NA

Text Books:	
1	Daniel Galin, “Software Quality Assurance” person publication, first edition, 2004.

Reference Books:	
1	Kshirasagar Naik and PriyadarshiTripathy, Software Testing & Quality Assurance- Theory and Practice, Wiley Studentedition, 2008
2	William E. Perry, Effective Methods for Software Testing, WILLEY, 3rdEdition
3	Alan C. Gillies, “Software Quality: Theory and Management”
4	M G Limaye, Software Testing, Tata McGraw-Hill, 2009

Web references/ MOOC/ Certification Course	
1	https://www.udemy.com/course/software-quality-assurance
2	https://in.coursera.org/specializations/software-testing-automation
3	https://www.softwaretestinghelp.com/software-quality-assurance
4	https://www.geeksforgeeks.org/software-engineering-software-quality-assurance

Question Paper Scheme:	
	End Semester Examination Duration: (2 Hours Theory Examination) **Note for Examiner: -** Q-1 Any Five out of Seven (25 Marks) Q-2 Any Two out of Three (06 Marks) Q-3 Mandatory question (05 Marks) Q-4 Any Two out of Three (08 Marks) Q-5 Any Two out of Three (06 Marks) *The question paper must comprehensively address all Course Outcomes (COs), align Taxonomy*

	levels, and ensure complete syllabus coverage.