PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY

(Autonomous)

Kanuru, Vijayawada-520007

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (Data Science)
III B. Tech – II Semester CSE (Data Science)

Software Testing Methodologies

Course Code	20DS4601D	Year	III	Semester	II
Course Category	PEC	Branch	CSE (Data Science)	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Software Engineering
Continuous Internal Evaluation	30	Semester End Examination	70	Total Marks	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		
CO1	Describe the fundamental concepts, principles, and role of testing in the softwaredevelopment life cycle.	**L2**
CO2	Apply dynamic testing techniques and validation activities to ensure software quality and reliability.	**L3**
CO3	Apply effective software test management practices, including test planning, execution and reporting to manage testing projects successfully.	**L3**
CO4	Analyze various testing strategies and techniques to determine their suitability for different software applications and contexts.	**L4**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Contribution of Course Outcomes towards achievement of Program Outcomes& Strength of correlations (3: High,2: Medium, 1: Low)														
CO1	2													
CO2	3													
CO3	3													
CO4		3										2		

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Introduction**: Testing as an Engineering Activity, Principles of Testing, Vmodel Concepts, Tester's Role in a Software Development Organization, Bugs, Origins of Defects, Cost of Defects, Defect Classes, The Defect Repository and Test, Developing a Defect Repository. **Testing Strategies and Techniques**: Design, Developer/Tester Support of Defect Prevention strategies.	CO1
II	**Testing Strategies and Techniques**: Unit Testing, Integration Testing, System and Acceptance Testing, Performance Testing, Regression Testing, Internationalization Testing, Ad hoc Testing, Object-Oriented Testing, Usability and Accessibility Testing **Software Testing Estimation Techniques**: Test Point Analysis, Function Point Analysis, Three Point Estimation Test, Wideband Delphi Method.	CO1, CO2
III	**Black Box Approach to Test Case Design**: Random Testing, Requirements based Testing, Equivalence Partitioning, Boundary Value Analysis, Cause Effect Graphing, State based Testing, Domain Testing. **White Box Approach to Test design**: Testing, Test Adequacy Criteria, Static Testing vs. Structural Adequacy Criteria based on Control Flow, Principles of Mutation Testing, Equivalent Mutants, Fault Detection using Mutation, Test Assessment using Mutation.	CO1, CO2, CO4
IV	**Test Management**: People and Organizational issues in Testing, Organization Structures for Testing Teams, Testing Services, Test Planning, Test Plan Components, Test Plan Attachments, Locating Test Items, Test Management, Test Process, Reporting Test Results, Introducing the Test Specialist, Test Automation Skills needed by a Test Specialist, Building a Testing Group.	CO1, CO2, CO3
V	**Software Test Automation**: Software Test Automation, Skill needed for Automation, Scope of Automation, Design and Architecture for Automation, Requirements for a Test tool, Challenges in Automation, Test Metrics and Measurements, Project Progress and Productivity Metrics. **Automation Tools**: Selenium, Junit, Cucumber.	CO1, CO3, CO4

Learning Resources
Text Books
1.Foundations of Software Testing, Aditya P. Mathur, Second Edition, 2014, Pearson.
Reference Books
1. Software Testing, Yogesh Singh, First Edition, 2013, Cambridge. 2. Effective Methods for Software Testing, William E. Perry, Third Edition, 2006, Wiley. 3. Software Testing: A Craftsman's Approach, Paul C. Jorgensen, Third Edition, 2015, Auerbach publication. 4. Software Testing: Principles and Practices, Naresh Chauhan, First Edition, 2010, Oxford University Press.
e- Resources & other digital material

1. Software Testing: https://onlinecourses.nptel.ac.in/noc23_cs38/preview
2. Software Testing : https://nptel.ac.in/courses/106105150
3. Software Testing : https://archive.nptel.ac.in/courses/106/101/106101163/
4. Software Testing Methodologies by Edureka:
   https://www.youtube.com/watch?v=6rNgPXz9A9s
5. Software Testing Methodologies:
   https://www.youtube.com/watch?v=_I5kpYJJBZk&list=PLdEdh7ef30CtlI_sOL1owY-XQlKYektw
6. Software Testing:
   https://www.youtube.com/watch?v=E2t5XbWwj7I&list=PLL34mf651faM_nn8uKlnwbQPw5zSh_F84
7. Introduction to Software Testing by Sanjay Rayadurgam
   https://www.coursera.org/learn/introduction-software-testing