In addition to Part I (general Handout for all courses appended to the time table), this portion gives further specific details regarding the course.

Course No. **:** **SS G552**
Course Title**:** **Software Testing Methods**
Instructor-in-charge: **PANKAJ VYAS** (pankajv@pilani.bits-pilani.ac.in)

1. Scope: Concepts and principles of software testing and quality assurance; software testing tools; functional, structural, integration and system testing techniques; software testing process and its management; evaluation of test effectiveness; testing specialized systems and applications; automated software testing; case studies.

Objective: The goal of the course is to provide students with the skill to select and apply a testing strategy and testing techniques that are appropriate to a particular software system or component. The aim of this course is to provide a conceptual understanding of Software testing. So that Students can develop skills to apply software testing at the module, subsystem, and system levels. The course will attempt to prepare students to test software in structured, organized ways. This course should provide practical knowledge of a variety of ways to test software. In addition the student will become a capable user of test tools; will be able to assess the effectiveness of their testing activity; and will be able provide evidence to justify their evaluation.

The **aims** of this Course are to:

a. Provide a systematic overview of standards, techniques and tools in software testing.
b. Introduce core methodologies for the management and execution of the testing process.
c. Introduce practical techniques for testing and apply them to simple examples

2.Text Book(s) :

TB: Foundations of Software Testing by Prof Aditya P. Mathur, Second edition (2013) Pearson Education.

3. Reference Book(s):
R1. Paul Jorgensen, Software Testing A Craftsman's Approach, Second Edition, 2002
R2. Boris Beizer, *Software Testing Techniques (second edition), dreamtech publication.*
R3. R. Patton, *Software Testing*, SAMS, 2005
R4. *William E. Perry, Effective Methods for Software Testing, Third Edition, Wiley. 2000*

Lecture Plan:

LECTURE NO.	TOPICS	REFERENCE
1 – 2	Fundamental Concepts of Software Testing: Errors, Quality, Correctness, Reliability, Debugging.	1.1-1.5
3	Test Metrics	1.6
4-5	Classification of Testing, Static Testing, Saturation Effect	1.11-1.14

6-7	Mathematical Concepts in Software Testing	2.1-2.6
8-10	Domain Partitioning: Equivalence Partitioning and Boundary value analysis, Category partition	3.1-3.5
11-13	Predicate Analysis: Domain Testing, Cause-Effect Graphing, Using predicate syntax	4.1-4.4
14-17	Finite State Models, Conformance Testing, w-method and partial w-method.	5.1-5.7
18-19	Combinatorial Designs in test generation	6.1-6.7
20	Test adequacy basics	7.1
21-23	Adequacy criteria based on control flow and data flow	7.2-7.5
24-27	Test adequacy assessment using program mutation.	8.1-8.12
28	Regression Testing, Selecting Regression tests	9.1-9.4
29-31	Test selection using execution trace and dynamic slicing, Scalability of test selection algorithms	9.5-9.7
32-33	Test Minimization and prioritization	9.8-9.9
34-35	Unit Testing: Test design, Junit, stubs, mocks, unit test tools	10.1-10.6
36-37	Integration testing: Integration errors, dependency, integration hierarchy.	11.1-11.5
38	Object Oriented Testing Issues	R1: 16.1-16.5
39-40	Class Testing	R1: 17.1-17.2

Term Paper: A student shall need to choose an appropriate topic to conduct research study, through a prior discussion with I/C. He/ She shall need to make at least two presentations over the research study conducted and submit a term paper (not report) over the study and seminar presentations. Term paper and presentations shall be evaluated over viva-voce.

Chamber Consultation: To be announcing later.

Evaluation Scheme:

S. No	Evaluation Component & Type	Duration	Weightage	Day, Date, Time, Venue
1	Mid Term Test (Closed Book)	90 Minutes	30%	9/10 10:00 - 11:30 AM
2	Project Assignment (Open Book)	TBA	30%	To be announced in Class
3.	Comprehensive Examination (Closed/Open Book)	180 Minutes	40%	10/12 AN

Make-up Policy: No make-up can be given for assignments. Make-up for written examinations may be granted in case of extreme exigencies like hospitalization.

Notices: All notices regarding this course will be placed on the course website. Some notices will also be placed on the notice board of Department of Computer Science.

Instructor-in-charge