



Department of Information Technology		LP: IT18004
		Rev. No: 01
B.E/B.Tech/M.E/M.Tech :	Information Technology	Regulation: 2018
PG Specialisation :	NA	Date: 11/01/2021
Sub. Code / Sub. Name :	IT18004 – Software Testing and Quality Assurance	
Unit :	I	

**Unit Syllabus: INTRODUCTION TO SOFTWARE TESTING**

Software testing lifecycle, software specifications, program correctness and verification, Failures, errors and faults, testing taxonomy.

**Objective:** In this unit, topics towards understanding mathematical foundations of software testing will be discussed in detail.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Software testing lifecycle	TB-1, Ch-3, (23-26)	LCD/BB
2	The V model of software testing	TB-1, Ch-3, (32-33)	LCD/BB
3	Software specifications	TB-1, Ch-4, (35-37)	LCD/BB
4	Principles of sound specification	TB-1, Ch-3, (37-38)	LCD/BB
5	Reliability Vs Safety	TB-1, Ch-3, (60-61)	LCD/BB
6	State based systems	TB-1, Ch-3, (61-70)	LCD/BB
7	Program correctness and verification	TB-1, Ch-3, (79-94)	LCD/BB
8	Failures, errors and faults, testing taxonomy	TB-1, Ch-3, (101-118)	LCD/BB
9	Fault management, Trouble with hyphenated testing, Classification theme.	TB-1, Ch-3, (125-138)	LCD/BB

**Content beyond syllabus covered (if any):** White box testing using Junit – software testing tool

\* Session duration: 50 minutes



Sub. Code / Sub. Name: IT18004 – Software Testing and Quality Assurance

Unit: II

**Unit Syllabus: TEST DATA GENERATION**

Test generation concepts, Functional and structural criteria, Test Oracle design, Test Driver design, Test outcome analysis.

**Objective:** In this unit, topics towards the comprehending the phases of software testing will be discussed in detail.

Session No *	Topics to be covered	Ref	Teaching Aids
10	Test generation concepts	TB-1, Ch-3, (112-200)	LCD/BB
11	Test generation and target attributes, Outcomes, generations requirement and criteria	TB-1, Ch-3, (112-200)	LCD/BB
12	Functional criteria	TB-1, Ch-3, (112-200)	LCD/BB
13	Domain partitioning, test data generations	TB-1, Ch-3, (112-200)	LCD/BB
14	structural criteria	TB-1, Ch-3, (112-200)	LCD/BB
15	Test Oracle design	TB-1, Ch-3, (112-200)	LCD/BB
16	Test Driver design	TB-1, Ch-3, (112-200)	LCD/BB
17	Test outcome analysis	TB-1, Ch-3, (112-200)	LCD/BB
18	Test outcome analysis	TB-1, Ch-3, (112-200)	LCD/BB
<b>Content beyond syllabus covered (if any):</b> Test data generation using white box testing tool - EclEmma			

\* Session duration: 50 mins



Sub Code / Sub Name: FT18004 – Software Testing and Quality Assurance

Unit: III

### Unit Syllabus: MANAGEMENT OF SOFTWARE TESTING

Metrics for software testing, tools – Scripting tools, record-and-replay tools, performance testing tools, oracle design tools, exception discovery, collaborative tools.

#### Objective:

In this unit, metrics that quantify the aspects of software testing as fault density, error proneness, failure probability, fault tolerance, the ease of identifying faults from static analysis, and the ease of detecting errors at run time, software testing tools and its classifications will be discussed.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Metrics for software testing	TB-1, CH-14 (313 – 332)	LCD/BB
20	Metrics for software testing	TB-1, CH-14 (313 – 332)	LCD/BB
21	Introduction to Software Testing Tools	TB-1, CH-15 (333)	LCD/BB
22	Scripting tools	TB-1, CH-15 (334-336)	LCD/BB
23	Record-and-replay tools	TB-1, CH-15 (336-338)	LCD/BB
24	Performance testing tools	TB-1, CH-15 (338 – 342)	LCD/BB
25	Oracle design tools	TB-1, CH-15 (342 – 343)	LCD/BB
26	Exception discovery	TB-1, CH-15 (343 -3 45)	LCD/BB
27	Collaborative tools	TB-1, CH-15 (345)	LCD/BB
<b>Content beyond syllabus covered (if any):</b> Demonstration of Selenium Tool			

\* Session duration: 50 minutes



Sub Code / Sub Name: **IT18004 – Software Testing and Quality Assurance**

Unit: IV

### Unit Syllabus: SOFTWARE QUALITY

Defining Software Quality, Software Quality factors, Components of software quality assurance system, pre project software quality components- Contract Review - Development and Quality Plans, integrating quality activities in project life cycle.

**Objective:** This Unit deals with Need for software quality requirements, Potential contribution of each component, Development and quality plans, the software quality assurance activities conducted throughout the project life cycle, their integration in the development process.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Defining Software Quality	TB-2, CH-2 (15 - 30)	LCD/BB
29	Software Quality factors	TB-2, CH-3 (35-51)	LCD/BB
30	Components of software quality assurance system	TB-2, CH-4 (57-74)	LCD/BB
31	Pre project software quality components Contract review	TB-2, CH-5 (77-87)	LCD/BB
32	Pre project software quality components Contract review	TB-2, CH-5 (77-87)	LCD/BB
33	Pre project software quality components Development and Quality Plans	TB-2, CH-6 (95-106)	LCD/BB
34	Pre project software quality components Development and Quality Plans	TB-2, CH-6 (95-106)	LCD/BB
35	Integrating quality activities in project life cycle	TB-2, CH-7 (121-142)	LCD/BB
36	Integrating quality activities in project life cycle	TB-2, CH-7 (121-142)	LCD/BB

**Content beyond syllabus covered (if any):** Case study on quality activities in project life cycle

\* Session duration: 50 minutes



Sub. Code / Sub. Name: **IT18004 – Software Testing and Quality Assurance**

Unit: V

**Unit Syllabus: STANDARDS, CERTIFICATION AND ASSESSMENT**

Need for standards, SQA Standards – ISO9001 Certification, bootstrap methodology, SPICE project and process assessment, Organizing for Quality Assurance -Management and its Role in Quality Assurance - SQA Unit & other actors, introduction to Six Sigma.

**Objective:** In this unit, Needs and benefits of Standards, how to implement the quality assurance organizational framework will be discussed.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Need for standards	TB-2, CH-23 (476)	LCD/BB
38	SQA Standards – ISO9001 Certification, bootstrap methodology	TB-2, CH-23 (477,480), (490-492)	LCD/BB
39	SQA Standards – ISO9001 Certification, bootstrap methodology	TB-2, CH-23 (477,480), (490-492)	LCD/BB
40	SPICE project and process assessment	TB-2, CH-23 (492-497)	LCD/BB
41	SPICE project and process assessment	TB-2, CH-23 (492-497)	LCD/BB
42	Organizing for Quality Assurance Management and its Role in Quality Assurance	TB-2, CH-25 (543-551)	LCD/BB
43	Organizing for Quality Assurance Management and its Role in Quality Assurance	TB-2, CH-25 (543-551)	LCD/BB
44	SQA Unit & other actors	TB-2, CH-26 (555-565)	LCD/BB
45	Introduction to Six Sigma.		LCD/BB
<b>Content beyond syllabus covered (if any):</b> Case study on Management and its Role in Quality Assurance			

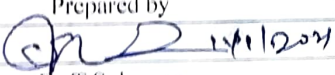
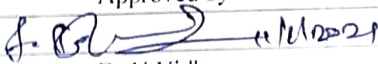
\* Session duration: 50 mins

**TEXT BOOKS:**

1. Ali Mili, Fairouz Tehier, "Software Testing: Concepts and Operations", John Wiley & sons, 2015.
2. Daniel Galin, "Software Quality Assurance: From Theory to Implementation", Pearson Addison-Wesley, Second Edition, 2012.

**REFERENCES:**

1. Jeff Tian, "Software Quality Engineering: Testing, Quality Assurance, and Quantifiable", Wiley, 2006.
2. Srinivasan Desikan and Gopaldaswamy Ramesh, "Software Testing – Principles and Practices", Pearson Education, 2006.
3. Ron Patton, "Software Testing", Second Edition, Sams Publishing, Pearson Education, 2007.

	Prepared by	Approved by
Signature		
Name	Dr T Sukumar	Dr V Vidhya
Designation	Associate Professor	Professor & Head
Date	11.01.2021	11.01.2021
Remarks *:	The existing lesson plan is going to be followed in both semester.	
Remarks *:		

\* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD