

Ref No:

Sri Krishna Institute of Technology,
Bangalore



COURSE PLAN

Academic Year 2019-2020

Program:	B.E.-Information Science and Engineering
Semester :	VI
Course Code:	17IS63
Course Title:	Software Testing
Credit / L-T-P:	4/4-0-0
Total Contact Hours:	50
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Academic Evaluation and Monitoring Cell

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A. COURSE INFORMATION

1. Course Overview

Degree:	B.E	Program:	IS
Semester:	VI	Academic Year:	2019-2020
Course Title:	Software Testing	Course Code:	17IS63
Credit / L-T-P:	04/4-0-0	SEE Duration:	180 Minutes
Total Contact Hours:	50	SEE Marks:	60 Marks
CIA Marks:	40	Assignment	1 / Module
Course Plan Author:	Veena M Naik	Sign ..	
Checked By:		Sign ..	
CO Targets	58.2	SEE Target:	50

Note: Define CIA and SEE % targets based on previous performance.

2. Course Content

Content / Syllabus of the course as prescribed by University or designed by institute.

Module	Content	Teaching Hours	Blooms Learning Levels
1	Basics of Software Testing: Basic definitions, Software Quality , Requirements, Behaviour and Correctness, Correctness versus Reliability, Testing and Debugging, Test cases, Insights from a Venn diagram, Identifying test cases, Test-generation Strategies, Test Metrics, Error and fault taxonomies , Levels of testing, Testing and Verification, Static Testing. Problem Statements: Generalized pseudocode, the triangle problem, the NextDate function, the commission problem, the SATM (Simple Automatic Teller Machine) problem, the currency converter, Saturn windshield wiper	10	L3
2	Functional Testing: Boundary value analysis, Robustness testing, Worst-case testing, Robust Worst testing for triangle problem, Nextdate problem and commission problem, Equivalence classes, Equivalence test cases for the triangle problem, NextDate function, and the commission problem, Guidelines and observations, Decision tables, Test cases for the triangle problem, NextDate function, and the commission problem, Guidelines and observations. Fault Based Testing: Overview, Assumptions in fault based testing, Mutation analysis, Fault-based adequacy criteria, Variations on mutation analysis.	10	L4
3	Structural Testing: Overview, Statement testing, Branch testing, Condition testing , Path testing: DD paths, Test coverage metrics, Basis path testing, guidelines and observations, Data -Flow testing: Definition-Use testing, Slicebased testing, Guidelines and observations. Test Execution: Overview of test execution, from test case specification to test cases, Scaffolding, Generic versus specific scaffolding, Test oracles, Self-checks as oracles, Capture and replay	10	L3
4	Process Framework :Basic principles: Sensitivity, redundancy, restriction, partition, visibility, Feedback, the quality process, Planning and monitoring, Quality goals, Dependability properties ,Analysis Testing, Improving the process, Organizational factors. Planning and Monitoring the Process: Quality and process, Test and analysis strategies and plans, Risk planning, monitoring the process, Improving the process, the quality team Documenting Analysis and Test: Organizing documents, Test strategy document, Analysis and test plan, Test design specifications documents, Test and 10 Hours	10	L4

	analysis reports.		
5	Integration and Component-Based Software Testing: Overview, Integration testing strategies, Testing components and assemblies. System, Acceptance and Regression Testing: Overview, System testing, Acceptance testing, Usability, Regression testing, Regression test selection techniques, Test case prioritization and selective execution. Levels of Testing, Integration Testing: Traditional view of testing levels, Alternative life-cycle models, The SATM system, Separating integration and system testing, A closer look at the SATM system, Decomposition-based, call graph-based, Path-based integrations.	10	L4
-	Total		

3. Course Material

Books & other material as recommended by university (A, B) and additional resources used by course teacher (C).

1. Understanding: Concept simulation / video ; one per concept ; to understand the concepts ; 15 – 30 minutes
2. Design: Simulation and design tools used – software tools used ; Free / open source
3. Research: Recent developments on the concepts – publications in journals; conferences etc.

Modul es	Details	Chapters in book	Availability
A	Text books (Title, Authors, Edition, Publisher, Year.)	-	-
1,2,3,5	Paul C. Jorgensen: Software Testing, A Craftsman's Approach, 3rd Edition, Auerbach Publications, 2008. (Listed topics only from Chapters 1, 2, 5, 6, 7, 9, 10, 12, 13)	1,2,5,6,7,9,10,12,13	In Library
2,3,4,5	Mauro Pezze, Michal Young: Software Testing and Analysis – Process, Principles and Techniques, Wiley India, 2009. (Listed topics only from Chapters 3, 4, 16, 17, 20,21, 22,24)	3,4,16,17,20,24,21,22	In Library
1,3	Aditya P Mathur: Foundations of Software Testing, Pearson Education, 2008.(Listed topics only from Section 1.2 , 1.3, 1.4 ,1.5, 1.8,1.12,6. 2.1,6. 2.4)	1,6	
B	Reference books (Title, Authors, Edition, Publisher, Year.)	-	-
1	Software testing Principles and Practices – Gopalaswamy Ramesh, Srinivasan Desikan, 2 nd Edition, Pearson, 2007.		
2	Software Testing – Ron Patton, 2nd edition, Pearson Education, 2004.		
3	The Craft of Software Testing – Brian Marrick, Pearson Education, 1995.		
4	Anirban Basu, Software Quality Assurance, Testing and Metrics, PHI, 2015.		
5	Naresh Chauhan, Software Testing, Oxford University press.		
C	Concept Videos or Simulation for Understanding	-	-
C1	https://www.softwaretestinggenius.com/tutorial-2-to-generate-bva-test-cases-for-the-triangle-problem/		
C2	https://www.youtube.com/watch?v=2Rkli23kyms		
C3	https://www.youtube.com/watch?v=busfqNkpgKI		
C4	https://www.youtube.com/watch?v=ntrgBWdYBu0		
C5	https://www.youtube.com/watch?v=QYCaaNz8emY		
D	Software Tools for Design	-	-
	https://www.atlassian.com/software/jira/try?&aceid=&adposition=&adgroup=93058444980&campaign=91		

	24878606&creative=415596853193&device=c&keyword=jira&matchtype=e&network=g&placement=&ds_kids=p51242181056&ds_e=GOOGLE&ds_eid=700000001558501&ds_e1=GOOGLE&gclid=CjoKcQjw6sHzBRCbARIsAF8FMpUheZVC0XDvqL-D35c3dbDsJ5t-k5cigX5rdXDMjZqvyRL-dHhQI_oaAiegEALw_wcB&gclsrc=aw.ds		
E	Recent Developments for Research	-	-
	Automation Testing		
F	Others (Web, Video, Simulation, Notes etc.)	-	-
1	https://vtucsenotes.wordpress.com/tag/paul-c-jorgensen/		

4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

Students must have learnt the following Courses / Topics with described Content . . .

Mod ules	Course Code	Course Name	Topic / Description	Sem	Remarks	Blooms Level
1,2	17CS45	Software Engineering	Fundamentals of Software Engineering	4	Studied as part of Program	L2
4,5	17CS551	Object Oriented Modelling and Design)	Fundamentals of OOMD	5	Studied as part of Program	L3

5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.

Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

Mod ules	Topic / Description	Area	Remarks	Blooms Level
1,2,3, 4,5	Recent Developments	Placement	Will be able to learn as part of the course	L4
1,2,3, 4,5	Certificate Courses	Placement	Will be able to learn as part of the course	L4

B. OBE PARAMETERS

1. Course Outcomes

Expected learning outcomes of the course, which will be mapped to POs.

Mod ules	Course Code.#	Course Outcome At the end of the course, student should be able to . . .	Teach. Hours	Instr Method	Assessme nt Method	Blooms' Level
1	17IS63.1	Understand modern software testing processes in relation to software development and project management	10	Chalk and Board	Assignme nt and slip test	L2,L3
2	17IS63.2	Create test strategies and plans, design test cases, prioritize and execute them.	10	Chalk and Board	Assignme nt and slip	L3,L4

					test	
3	17IS63.3	Manage incidents and risks within a project.	10	Chalk and Board	Assignment and slip test	L3
4	17IS63.4	Implement efficient delivery in the software development processes.	10	Chalk and Board	Assignment and slip test	L4
5	17IS63.5	Application of integration testing techniques in commercial environments	10	Chalk and Board	Assignment and slip test	L4
-	-	Total	50	-	-	L2-L4

2. Course Applications

Students should be able to employ / apply the course learnings to ...

Modules	Application Area Compiled from Module Applications.	CO	Level
1	To develop error free software product	CO1	L3
2	Test input text, menu functions, software functionalities and setup on localized machines	CO2	L4
3	To test certain error message in an application	CO3	L3
4	Ensuring the best and driven by high delivery standards	CO4	L4
5	When talking in terms of testing large application using black box testing technique	CO5	L4

3. Articulation Matrix

CO – PO Mapping with mapping level for each CO-PO pair, with course average attainment.

Modules	CO.#	Course Outcomes At the end of the course student should be able to ...	Program Outcomes															Level		
			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3			
1	17IS63.1	Understand modern software testing processes in relation to software development and project management	3	3	3										2	3	2			
2	17IS63.2	Create test strategies and plans, design test cases, prioritize and execute them.	2	3											3	2				
3	17IS63.3	Manage incidents and risks within a project.	2	2										3	3		2			
4	17IS63.4	Implement efficient delivery in the software development processes.		3											3			3		
5	17IS63.5	Application of integration testing techniques in commercial environments	3	3											3			3		
-	17IS63	Average	3	3	3										2	3	2	2	3	-
-	PO, PSO	1.Engineering Knowledge; 2.Problem Analysis; 3.Design / Development of Solutions; 4.Conduct Investigations of Complex Problems; 5.Modern Tool Usage; 6.The Engineer and Society; 7.Environment and Sustainability; 8.Ethics; 9.Individual and Teamwork; 10.Communication; 11.Project Management and Finance; 12.Life-long Learning; S1.Software Engineering; S2.Data Base Management; S3.Web Design																		

4. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs.

Mod	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
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ules					
1					
2					

C. COURSE ASSESSMENT

1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation.

Mod ules	Title	Teach. Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Basics of software testing	10	2	-	-	1		2	CO1	L2,L3
2	Functional testing	10	2	-	-	1		2	CO2	L3,L4
3	Structural testing	10	-	2	-	1		2	CO3	L3
4	Process framework	10	-	2	-	1		2	CO4	L4
5	Integration and component based software testing	10	-	-	4	1		2	CO5	L4
-	Total	50	4	4	4	5		10	-	-

2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

Mod ules	Evaluation	Weightage in Marks	CO	Levels
1, 2	CIA Exam - 1	30	CO1,CO2	L2,L3,L4
3, 4	CIA Exam - 2	30	CO3,CO4	L3,L4
5	CIA Exam - 3	30	CO5	L4
1, 2	Assignment - 1	10	CO1,CO2	L2,L3,L4
3, 4	Assignment - 2	10	CO3,CO4	L3,L4
5	Assignment - 3	10	CO5	L4
1, 2	Seminar - 1		-	-
3, 4	Seminar - 2		-	-
5	Seminar - 3		-	-
1, 2	Quiz - 1		-	-
3, 4	Quiz - 2		-	-
5	Quiz - 3		-	-
1 - 5	Other Activities - Mini Project	-		
	Final CIA Marks	40	-	-

D1. TEACHING PLAN - 1

Module - 1

Title:	Basics of Software Testing	Appr Time:	10 Hrs
a	Course Outcomes	CO	Blooms Level
-	The student should be able to:	-	
1	Understand modern software testing processes in relation to software development and project management	CO1	L2,L3
b	Course Schedule	-	-
Class No	Portion covered per hour	-	-

1	Basic definitions, Software Quality , Requirements	CO1	L2
2	Behavior and Correctness, Correctness versus Reliability	CO1	L2
3	Testing and Debugging Test cases, Insights from a Venn diagram	CO1	L2
4	Identifying test cases, Test-generation Strategies, Test Metrics	CO1	L3
5	Error and fault taxonomies	CO1	L3
6	Levels of testing	CO1	L3
7	Testing and Verification, Static Testing	CO1	L2
8	Problem Statements: Generalized pseudocode, the triangle problem,	CO1	L3
9	The NextDate function, the commission problem	CO1	L3
10	The SATM (Simple Automatic Teller Machine) problem, the currency converter, Saturn windshield wiper	CO1	L3
d	Review Questions		
1	What is software testing? Why it is so important in SDLC?.	CO1	L2
2	Define Error, Fault, Failure, Incident, Test and Test cases	CO1	L2
3	Explain functional testing and structural testing with a neat diagram.	CO1	L2
4	Explain error and fault taxonomies	CO1	L3
5	With a neat diagram explain level of testing	CO1	L3
6	.Design and develop a program in a c language to solve the triangle problem defined as follows: Accept three integers which are supposed to be the three sides of a triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Derive test cases for your program based on decision-table approach.	CO1	L3
7	Write a pseudo code and flowchart of the traditional triangle program implementation.	CO1	L2
8	Write a pseudo code of the next date function.	CO1	L3
9	With a neat diagram, explain the SATM (Simple auto teller machine) system	CO1	L3
10	Explain currency converter with a neat diagram.	CO1	L3
e	Experiences	-	-
1		CO1	L2
2			

Module – 2

Title:	Functional Testing	Appr Time:	10 Hrs
a	Course Outcomes	CO	Blooms Level
-	The student should be able to:	-	
1	Create test strategies and plans, design test cases, prioritize and execute them.	CO2	L3,L4
b	Course Schedule	-	-
Class No	Portion covered per hour	-	-
1	Functional Testing: Boundary value analysis, Robustness testing,	CO2	L2
2	Worst-case testing,	CO2	L3
3	Robust Worst testing for triangle problem,	CO2	L2
4	Nextdate problem and commission problem, Equivalence classes,	CO2	L3
5	Equivalence test cases for the triangle problem,	CO2	L3
6	NextDate function, and the commission problem, Guidelines and observations,	CO2	L3
7	Decision tables, Test cases for the triangle problem,	CO2	L3
8	NextDate function, and the commission problem, Guidelines and observations.	CO2	L2
9	Fault Based Testing: Overview, Assumptions in fault based testing, Mutation analysis	CO2	L2
10	Fault-based adequacy criteria, Variations on mutation analysis.	CO2	L4

c	Application Areas	-	-
-	Students should be able employ / apply the Module learnings to . . .	-	-
1	Test input text, menu functions, software functionalities and setup on localized machines	CO2	L3,L4
d	Review Questions	-	-
1	Write a short notes on boundary value analysis [BVA]	CO2	L2
2	Explain generalized boundary value analysis	CO2	L3
3	What are the limitations of boundary value analysis?	CO2	L2
4	Explain Robustness testing, Worst-Case testing and Special value testing with example	CO2	L3
5	Explain random testing with an example	CO2	L3
6	What are the guidelines for boundary value testing?	CO2	L3
7	Define Equivalence classes and list different types of equivalence Classes.	CO2	L3
8	Explain Weak and strong normal equivalence class testing	CO2	L2
9	Explain equivalence class test cases with an example	-	-
10	Write guideline and observations for equivalence class testing	CO3	L2

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs Code:	17IS63	Sem:	VI	Marks:	30	Time:	75 minutes	
Course:								
-	-	Note: Answer all questions, each carry equal marks. Module : 1, 2				Marks	CO	Level
1	a	Define the following terms: 1) Error 2) Fault 3) Failure 4) Incident				8	CO1	L2
	b	Explain the Testing life cycle? And also explain the different types of testing techniques?				7	CO1	L2
		OR						
2	a	Explain the Commission problem and SATM system				8	CO1	L3
	b	Explain the error and fault taxonomies				7	CO1	L3
3	a	Write a short note on Robustness testing ,Random testing, special value testing ,Robust worst case testing				8	CO2	L3
	b	Explain the triangle problem statement with traditional implementation				7	CO2	L4
		OR						
4	a	Explain the equivalence class testing . Also explain the next date problem as an example and write all the test cases.				7	CO2	L3
	b	Explain the boundary value analysis with an example also describes the generalization and limitation of the BVA				8	CO2	L4

b. Assignment -1

Model Assignment Questions							
Crs Code:	17IS63	Sem:	VI	Marks:	10	Time:	
Course:	Software Testing						
SNo	Assignment Description				Marks	CO	Level
1	What is software testing? Why it is so important in SDLC?.				6	CO1	L2
2	Define Error, Fault, Failure, Incident, Test and Test cases				10	CO1	L2
3	Explain functional testing and structural testing with a neat diagram.				8	CO1	L3
4	Explain error and fault taxonomies				7	CO1	L3
5	With a neat diagram explain level of testing				8	CO1	L3
6	Write a short notes on boundary value analysis [BVA]				8	CO2	L2
7	Explain generalized boundary value analysis				7	CO2	L3
8	What are the limitations of boundary value analysis?				5	CO2	L2

9	Explain Robustness testing, Worst-Case testing and Special value testing with example	10	CO2	L4
10	Explain random testing with an example	8	CO2	L3
11	What are the guidelines for boundary value testing?	7	CO2	L2
12	Define Equivalence classes and list different types of equivalence Classes.	8	CO2	L2
13	Write guideline and observations for equivalence class testing	7	CO2	L2

D2. TEACHING PLAN - 2

Module – 3

Title:	Structural Testing	Appr Time:	10 Hrs
a	Course Outcomes	CO	Blooms Level
-	At the end of the topic the student should be able to . . .	-	
	Manage incidents and risks within a project.	CO3	L3
b	Course Schedule		
Class No	Portion covered per hour	-	-
21	Structural Testing: Overview, Statement testing,	CO3	L2
22	Branch testing,	CO3	L3
23	Condition testing ,	CO3	L3
24	Path testing: DD paths,	CO3	L3
25	Test coverage metrics,	CO3	L3
26	Basis path testing, guidelines and observations,	CO3	L3
27	Data –Flow testing: Definition-Use testing, Slicebased testing, Guidelines and observations.	CO3	L3
28	Test Execution: Overview of test execution, from test case specification to test cases,	CO3	L3
29	Scaffolding, Generic versus specific scaffolding, Test oracles,	CO3	L3
30	Self-checks as oracles, Capture and replay	CO3	L3
c	Application Areas	-	-
-	Students should be able employ / apply the Module learnings to . . .	-	-
	To test certain error message in an application	CO3	L3
d	Review Questions	-	-
-	The attainment of the module learning assessed through following questions	-	-
1	Define a program graph?		
2	Draw program graph of the triangle program	CO3	L2
3	Define DD-Path? Draw a chain of nodes in a directed graph .	CO3	L2
4	Draw and explain program graph of the triangle program.	CO3	L2
5	Define DD-Path graph? Draw and explain DD-path graph for the triangle program.	CO3	L2
6	Explain test coverage metrics	CO3	L2
7	Explain concatenated, nested and knotted loops with a neat diagram	CO3	L2
8	Explain Metric-based testing	CO3	L2
9	Explain the following 1) Statement and predicate testing 2) DD-path testing 3) Dependent pairs of DD-paths 4) Multiple condition coverage 5) Loop coverage	CO3	L2
10	Explain basis path testing	CO2	L2
11	Explain McCabe's basis path method with an example	CO3	L2
12	Define the following 1) Defining node 2) Usage node 3) Predicate use and computation use 4) Definition-use path 5) Definition-clear path	CO3	L2
13	Draw program graph of the commission program and find du-paths for total locks, sales and commission	CO3	L3
14	Define 1) All-Defs Criterion 2) All-Uses Criterion 3) All-P-Uses/Some C-Uses	CO3	L2

	Criterion 4) All-C-Uses/Some P-Uses Criterion 5) All-Du-path Criterion		
15	Explain slice-based testing with an example	CO3	L2
16	Write a style and technique of slice based testing	CO3	L2
17	What are guidelines and observations of slice based testing	CO3	L2
e	Experiences	-	-
1			
2			

Module – 4

Title:	Process framework	Appr Time:	10 Hrs
a	Course Outcomes	CO	Blooms Level
-	At the end of the topic the student should be able to . . .	-	
1	Implement efficient delivery in the software development processes.	CO4	L4
b	Course Schedule		
Class No	Portion covered per hour	-	-
31	Process Framework: Basic principles: Sensitivity, redundancy, restriction, partition,	CO4	L2
32	visibility, Feedback, the quality process, Planning and monitoring,	CO4	L3
33	Quality goals, Dependability properties, Analysis Testing	CO4	L3
34	Improving the process, Organizational factors.	CO4	L3
35	Planning and Monitoring the Process: Quality and process,	CO4	L4
36	Test and analysis strategies and plans,	CO4	L3
37	Risk planning, monitoring the process, Improving the 10 Hours process,	CO4	L3
38	the quality team Documenting Analysis and Test: Organizing documents,	CO4	L3
39	Test strategy document, Analysis and test plan,	CO4	L3
40	Test design specifications documents, Test and analysis reports	CO4	L3
c	Application Areas	-	-
-	Students should be able employ / apply the Module learnings to . . .	-	-
1	Ensuring the best and driven by high delivery standards	CO4	L4
d	Review Questions	-	-
-	The attainment of the module learning assessed through following questions	-	-
1	Define verification and validation?		
2	Differentiate between verification and validation	CO4	L2
3	With a neat diagram, explain degree of freedom	CO4	L3
4	List and explain basic principles	CO4	L3
5	Explain Quality process	CO4	L3
6	Explain planning and monitoring	CO4	L4
7	Write a short note on analysis and testing	CO4	L3
8	Explain organization factors	CO4	L3
e	Experiences		
1			
2			

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs Code:	17IS63	Sem:	VI	Marks:	30	Time	75 minutes
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Course:					
-	-	Note: Answer all questions, each carry equal marks. Module : 3, 4	Marks	CO	Level
1	a	Define DD-path. Draw DD-graph for triangle problem	7	CO3	L3
	b	Explain the concept of basis path testing	8	CO3	L3
OR					
2	a	Explain the metric based testing	7	CO3	L4
	b	Define predicate node, du-path and dc-path, give du-paths for stocks, locks, and total locks for Commission sales problem	8	CO3	L4
3	a	Explain sensitivity and redundancy.	6	CO4	L3
	b	Briefly discuss the dependability properties in process framework.	7	CO4	L3
	c	Define validation	2	CO4	L2
4	a	Define below terms with respect to fault based –testing. i) Original program ii) Program location	8	CO4	L4
	b	Explain the concept of Risk management with respect to generic to process and specific to quality management	7	CO4	L4

b. Assignment – 2

Model Assignment Questions								
Crs Code:	17IS63	Sem:	VI	Marks:	10	Time:	75 minutes	
Course:	Software Testing							
SNo	Assignment Description					Marks	CO	Level
1	Define DD-Path graph? Draw and explain DD-path graph for the triangle program.					8	CO3	L3
2	Explain test coverage metrics					5	CO3	L2
3	Explain the following 1) Statement and predicate testing 2) DD-path testing 3) Dependent pairs of DD-paths 4) Multiple condition coverage 5) Loop coverage					10	CO3	L2
4	Explain McCabe's basis path method with an example					8	CO3	L3
5	Define the following 1) Defining node 2) Usage node 3) Predicate use and computation use 4) Definition-use path 5) Definition-clear path					10	CO3	L2
6	Draw program graph of the commission program and find du-paths for total locks, sales and commission					9	CO3	L4
7	Define 1) All-Defs Criterion 2) All-Uses Criterion 3) All-P-Uses/Some C-Uses Criterion					8	CO3	L2
8	Explain slice-based testing with an example					6	CO3	L3
9	Write a style and technique of slice based testing					6	CO3	L2
10	What are guidelines and observations of slice based testing					6	CO3	L2
11	List and explain basic principles					4	CO4	L3
12	Explain Quality process					4	CO4	L3
13	Explain planning and monitoring					8	CO4	L3
14	Write a short note on analysis and testing					7	CO4	L3

D3. TEACHING PLAN - 3

Module – 5

Title:	Integration and Component-Based Software Testing	Appr Time:	10 Hrs
a	Course Outcomes	CO	Blooms

-	At the end of the topic the student should be able to . . .	-	Level
1	Application of integration testing techniques in commercial environments	CO5	L4
b	Course Schedule	-	-
Class No	Portion covered per hour	-	-
41	Integration and Component-Based Software Testing: Overview, Integration testing strategies,	CO5	L2
42	Testing components and assemblies. System,	CO5	L3
43	Acceptance and Regression Testing:	CO5	L4
44	Overview, System testing,	CO5	L4
45	Acceptance testing, Usability,	CO5	L4
46	Regression testing, Regression test selection techniques, Test case prioritization and selective execution.	CO5	L3
47	Levels of Testing, Integration Testing: Traditional view of testing levels, Alternative life-cycle models,	CO5	L3
48	The SATM system, Separating integration and system testing,	CO5	L4
49	A closer look at the SATM system, Decomposition-based,	CO5	L4
50	call graph-based, Path-based integrations.	CO5	L4
c	Application Areas	-	-
-	Students should be able employ / apply the Module learnings to . . .	-	-
1	Testing large application using black box testing technique	CO5	L4
d	Review Questions	-	-
-	The attainment of the module learning assessed through following questions	-	-
1	Explain traditional view of testing levels		
2	Explain alternative life cycle models	CO5	L2
3	With a neat diagram explain waterfall spin-offs	CO5	L3
4	With a neat diagram explain specification-based life cycle models	CO5	L4
5	Explain the SATM system with a neat diagram	CO5	L4
6	Explain separating integration and system testing	CO5	L4
7	Write short notes on structural insights	CO5	L3
8	Write short notes on behavioral insights	CO5	L3
9	Explain Decomposition-Based integration with a neat diagram	CO5	L4
10	Write short notes on 1) Top-Down Integration 2) Bottom-Up Integration 3) Sandwich integration 4) Call graph-based integration 5) Pair wise integration 6) Neighborhood integration	CO5	L4
11	Explain the comparison of integration testing strategies .	CO5	L2
e	Experiences		
1			
2			

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs Code	17IS63	Sem:	VI	Marks:	30	Time:	75 minutes	
Course:								
-	-	Note: Answer all questions, each carry equal marks. Module : 5				Marks	CO	Level
1	a	With a neat diagram explain waterfall spin-offs				8	CO5	L3
	b	Explain separating integration and system testing				7	CO5	L3
OR								
2	a	Explain Decomposition-Based integration with a neat diagram				7	CO5	L3

	b	Explain the comparison of integration testing strategies .	8	CO5	L3
3	a	Write short notes on 1) Top-Down Integration 2) Bottom-Up Integration 3) Sandwich integration 4) Call graph-based integration 5) Pair wise integration 6) Neighborhood integration	10	CO5	L2
	b	Explain alternative life cycle models	5	CO5	L3
OR					
4	a	With a neat diagram explain specification-based life cycle models	8	CO5	L3
	b	Explain traditional view of testing levels	7	CO5	L3

b. Assignment – 3

Model Assignment Questions								
Crs Code:	17IS63	Sem:	VI	Marks:	10	Time:	75 minutes	
Course:	Software Testing							
SNo	Assignment Description					Marks	CO	Level
1	Explain traditional view of testing levels					5	CO5	L3
2	Explain alternative life cycle models					5	CO5	L3
3	With a neat diagram explain waterfall spin-offs					8	CO5	L2
4	With a neat diagram explain specification-based life cycle models					8	CO5	L4
5	Explain the SATM system with a neat diagram					7	CO5	L3
6	Explain separating integration and system testing					8	CO5	L3
7	Write short notes on structural insights					6	CO5	L3
8	Write short notes on behavioral insights					6	CO5	L3
9	Explain Decomposition-Based integration with a neat diagram					8	CO5	L2
10	Write short notes on 1) Top-Down Integration 2) Bottom-Up Integration 3) Sandwich integration 4) Call graph-based integration 5) Pair wise integration 6) Neighborhood integration					10	CO5	L2
11	Explain the comparison of integration testing strategies .					8	CO5	L3

F. EXAM PREPARATION

1. University Model Question Paper

Course:	Sensors and Transducers				Month / Year	May /2020		
Crs Code:	17IS63	Sem:	6	Marks:	80	Time:	180 minutes	
Module	Answer all FIVE full questions. All questions carry equal marks.					Marks	CO	Level
1	a	Define the following terms: 1) Error 2) Fault 3) Failure 4) Incident				8	CO1	L2
	b	Explain the Testing life cycle? And also explain the different types of testing techniques?				7	CO1	L2
OR								
2	a	Explain the Commission problem and SATM system				8	CO1	L3
	b	Explain the error and fault taxonomies				7	CO1	L3
3	a	Write a short note on Robustness testing ,Random testing, special value testing ,Robust worst case testing				8	CO2	L3
	b	Explain the triangle problem statement with traditional implementation				7	CO2	L4
OR								
4	a	Explain the equivalence class testing . Also explain the next date problem as an example and write all the test cases.				7	CO2	L3
	b	Explain the boundary value analysis with an example also describes the generalization and limitation of the BVA				8	CO2	L4

5	a	Define DD-path. Draw DD-graph for triangle problem	7	CO3	L3
	b	Explain the concept of basis path testing	8	CO3	L3
		OR			
6	a	Explain the metric based testing	7	CO3	L4
	b	Define predicate node, du-path and dc-path, give du-paths for stocks, locks, and total locks for Commission sales problem	8	CO3	L4
7	a	Explain sensitivity and redundancy.	6	CO4	L3
	b	Briefly discuss the dependability properties in process framework.	7	CO4	L3
	c	Define validation	2	CO4	L2
		OR			
8	a	Define below terms with respect to fault based –testing. i) Original program ii) Program location	8	CO4	L4
	b	Explain the concept of Risk management with respect to generic to process and specific to quality management	7	CO4	L4
9	a	Write short notes on 1) Top-Down Integration 2) Bottom-Up Integration 3) Sandwich integration 4) Call graph-based integration 5) Pair wise integration 6) Neighborhood integration	10	CO5	L2
	b	Explain alternative life cycle models	5	CO5	L3
		OR			
10	a	With a neat diagram explain specification-based life cycle models	8	CO5	L3
	b	Explain traditional view of testing levels	7	CO5	L3

2. SEE Important Questions

Course:	Software Testing				Month / Year	May/2020		
Crs Code:	17IS63	Sem:	VI	Marks:	60	Time:		
	Note Answer all FIVE full questions. All questions carry equal marks.					-	-	
Mod ule	Qno.	Important Question				Marks	CO	Year
1	a	Define the following: I) error II) Fault III) Failure IV) Test V) Reliability VI) Usability VII) correctness VIII) Performance				8	CO1	2018
	b	Explain Structured implementation of a triangle problem with a neat flow diagram				8	CO1	2018
2	a	Explain testing and debugging with a neat diagram				8	CO1	2018
		Explain functional and structural testing				8	CO1	2018
3	a	Explain boundary value analysis. Mention its limitations. Derive BVA Test cases for triangle problem.				8	CO2	2018
	b	Briefly explain the variants of equivalence class testing. Derive equivalence class test case for next date problem.				8	CO2	2018
4	a	Explain the format of decision table. Build decision table for simple version of triangle problem				8	CO2	2018
	b	Explain fault based testing with its terminologies and assumptions.				8	CO2	2018
5	a	Write a note on i) Statement testing and branch testing				8	CO3	2018
	b	What is DD-path? Explain basis path testing with example				8	CO3	2018
6	a	What is the use of data flow testing .List and define various terms in				8	CO3	2018

		define -use testing.			
	b	Explain scaffolding. Differentiate between generic and specific scaffolding	8	CO3	2018
7	a	Write a note on i)sensitivity ii)Redundancy iii)Partition iv)feedback	8	CO4	2018
	b	Explain dependability properties.	8	CO4	2018
8	a	Explain risk planning with different types of risks	8	CO4	2018
		Write a short note on a standard organization of an analysis and test plan	8	CO4	2018
9	a	Explain i)Acceptance testing ii)Usability testing	8	CO5	2018
	b	Explain decomposition based integration testing	8	CO5	2018
10	a	Explain call-graph based integration testing	8	CO5	2018
	b	Explain the context diagram of SATM system	8	CO5	2018

Course Outcome Computation

Academic Year:

Odd / Even semester

INTERNAL TEST		T1						T2					
Course Outcome	CO1	CO2		CO3		CO4		CO5		CO6			
QUESTION NO	Q1	LV	Q2	LV	Q3	LV	Q1	LV	Q2	LV	Q3	LV	
MAX MARKS													
USN-1													
USN-2													
USN-3													
USN-4													
USN-5													
USN-6													
Average CO Attainment													
LV Threshold : 3:>60%, 2:>=50% and <=60%, 1: <=49%													
CO1 Computation : (2+2+2+3)/4 = 10/4=2.5													

PO Computation

Program Outcome	PO1	PO3	PO3	PO1	PO12	PO12						
Weight of CO - PO	3	1	3	2	2	3						
Course Outcome	CO1	CO2	CO3	CO4	CO5	CO6						
Test/Quiz/Lab QUESTION NO	T1						T2					
	Q1	LV	Q2	LV	Q3	LV	Q1	LV	Q2	LV	Q3	LV
MAX MARKS												
USN-1												
USN-2												
USN-3												
USN-4												
USN-5												
USN-6												
Average CO Attainment												

