BCA(6thSemester)
Teaching Schedule

030010607: CC14Software Testing Techniques

Objective: To introduce the basic concepts of software testing, its types for determining system acceptability using testing techniques and test automation tools so as to ensure delivery of quality web and mobile applications.

Course Outcomes: Upon completion of the course, students shall be able to

CO1: Discuss the needs, concepts, process and importance of application testing.
CO2: Describe application testing levels and strategies.
CO3: Analyse, evaluate and use relevant application testing techniques and tools for specific application environment.
CO4: Design test plan, develop and execute test cases for application acceptance.
CO5: Appreciate the need for test automation tools with its usage.
CO6: Analyse and test web and mobile applications.

Unit	Sub Unit	No. of Lecture (s)	Topics	Reference Chapter/Additional Reading	Teaching Methodology	Evaluation Parameters
					Planned	
Unit 1:Software Testing Fundamentals and Test Case Generation						**Total Lecture:08**
1	1.1	2	Application Failures, Needs of Software Testing	(RP)#18-Page No.482 (YS)#1-Page No. 1-16	Chalk and talk + PowerPoint presentation	Quiz
	1.2	1	Testing versus Quality and Debugging	(YS)#1-Page No. 23-24 (RP)#17-Page No.473	Reading and discussion	
	1.3	1	Test and Testability Characteristics of Software	(RP)#18-Page No.482-483	PowerPoint Presentation	
	1.4	2	Test Cases and Test Suites : Generation of Test cases from use cases	(RP)#18-Page No.483 (YS)#1-Page No. 21-22 (YS)#6-Page No. 285-290	Chalk and talk + Demonstration	
	1.5	1	Guidelines for generating validity checks	(YS)#6-Page No. 290-296	Open textbook study	
	1.6	1	V-Model for testing: An overview	(YS)#1-Page No. 26 – 27	Group Discussion	

Unit 2: Structural and Functional Testing						**Total Lectures:11**
2	2.1	1	Unit testing : Meaning, Needs, Test Considerations	(RP)#17-Page No.456-458 (YS)#8-Page No. 369	PowerPoint Presentation + video( )	Quiz + Unit Test1
	2.2	2	Black Box and White Box Testing : Needs, Features, Benefits, Differences	(RP)#18-Page No.485-491,495-499	Demonstration + HandsOn Chalk & Talk + PowerPoint Presentation+ Video(http://www.softwaretestingmentor.com/istqb-videos/)	
	2.3	3	Structural Testing : Basis Path Testing and Types, Control Flow Testing and types, Cyclomatic Complexity, Data Flow Testing, Loop Testing and types, Slice based Testing	(RP)#18-Page No.485-494 (YS)#4-Page No. 165 – 202,144-150,197		
	2.4	1	Object Oriented Testing : Introduction, Levels	(RP)#19-Page No.513		
	2.5	1	Class based Testing, Fault and Scenario Testing	(RP)#19-Page No.519-520		
	2.6	2	Functional Testing : Equivalence Class and Boundary Value Analysis, Orthogonal Array, Decision Table , Cause-Effect Graphing Technique	(RP)#18-Page No.495-499 (YS)#2-Page No. 37 – 99		
	2.7	1	Integration Testing : Types: Top-Down, Bottom-Up, Regression Testing, Smoke Testing	(RP)#17-Page No.459-464 (YS)#8-Page No. 370-373 (YS)#7-Page No. 335-339		
Unit 3: Validation, System and Acceptance Testing						**Total Lectures:08**

3	3.1	2	Validation Testing : Criteria, Configuration Reviews, Alpha and Beta Tests	(RP)#17-Page No.467-469 (YS)#1-Page No. 22	PowerPoint Presentation	Unit Test -1
	3.2	2	System Testing : Characteristics, Benefits and Applications	(YS)#8-Page No. 373 (RP)#17-Page No.470	Comprehensive reading from textbook.	
	3.3	3	System Testing Types : Recovery, Security, Performance , Stress, Load and Deployment Tests	(RP)#17-Page No.470-472 RP)#17-Page No.471 (YS)#11-Page No. 476 - 479	Video(itelearn.com/home-page-performance-testing/)	
	3.4	1	Acceptance Testing	(YS)#8-Page No. 373	PowerPoint Presentation	
Unit 4: Application Test Automation and Tools						**Total Lectures:14**
4	4.1	1	Need for Automation and application testing tools	(NC)#15-Page No. 430	Video (http://www.softwaretestingmentor.com/istqb-videos/)	Open Book Test + Unit test-2
	4.2	2	Categorization	(NC)#15-Page No. 431-434	Chalk &Talk	
	4.3	2	Selection criteria	(NC)#15-Page No. 434	PowerPoint presentation	
	4.4	3	Guidelines	(NC)#15-Page No. 436	Comprehensive reading from textbook.	
	4.5	3	Automated Test Data Generation : Static and Dynamic diagram	(YS)#12-Page No. 494-495	Demonstration	
	4.6	3	Test Adequacy Criteria	(YS)#12-Page No.	PowerPoint presentation	

				495		
Unit 5: Testing for Web Applications						**Total Lectures:08**
	5.1	2	Web Testing : Web Application versus Client Server Application, Key Areas in Web Application Testing	(RP)#18-Page No.503 (YS)#11-Page No.453-454	Pretest	Unit Test -2
	5.2	2	User Interface Testing : Navigation, Form Based	(RP)#18-Page No.503. (RP)#20-Page No.537-542	Group Discussion	
	5.3	2	Configuration and Compatibility Testing	(RP)#20-Page No.545-548 (YS)#11-Page No.458	PowerPoint Presentation	
	5.4	2	Content Testing : Objectives and Database Testing	(RP)#20-Page No.534-535	PowerPoint Presentation + video(http://www.softwaretestingmentor.com/istqb-videos/)	
Unit 6: Testing for Mobile Environment						**Total Lectures:06**
	6.1	1	Mobile Application Testing: Introduction, Needs, Challenges for testers.	(RP)#20-Page No.534-535	PowerPoint Presentation	Unit Test-2
	6.2	1	Quality Characteristics for Mobile Testing	http://www.diva-portal.se/smash/get/diva2:867622/FULLTEXT02.pdf	Group Discussion	

	6.3	1	Testing strategies and tools	https://ymedialabs.com/17-strategies-for-end-to-end-mobile-testing-on-both-ios-and-android/	Power Point Presentation	
	6.4	3	Component Testing : Activities, Services and ContentProviders	(EH)#10-Page No.194-198	Demonstration + HandsOn	

References :

Text Books:

1. Yogesh Singh- Software Testing-Cambridge[YS]
2. Pressman, R. S. -Software Engineering: A Practitioner's Approach -McGraw Hills. [RP]

Reference Books:

3. NareshChauhan – Software Testing Principles and Practices[NC]]
4. SatyaAvasarala – Selenium WebDriver Practical Guide – Packt Publishing
5. William Perry – Effecitve Methods for Software Testing – Wiley
6. Hitesh Gupta - Software Testing- International Book House- Pearson
7. NageswaraRaoPusuluri – Software Testing Concepts and Tools – Dreamtech
8. Ali Mili, FairouzTchier – Software Testing Concepts and Operations – Wiley
9. Software Testing and Quality Assurance Theory and Practice: K. Naik, P. Tripathy – Wiley
10. Graham Bath, Judy McKey - The Software Test Engineers Handbook – SPD
11. M. G. Limaye - Software Testing Principles, Techniques, and Tools –TMH
12. Ron Pattorn - Software Testing- Sams Pearson
13. Dorothy Graham, Erik Van Veenendaal, Isabel Evans and Rex Black. Foundations of Software Testing: ISTQB Certification, Cengage
14. Rex Black. Advanced Software Testing Vol. 1, SPD
15. Paul C Jorgensen. Software Testing: A Craftsman's Approach, Auerbach Publications
16. Erik Hellman, Android Programming, Pushing the limits, Wiley. [EH]
17. http://www.seleniumhq.org/docs/
18. http://junit.sourceforge.net/javadoc/index.html

Note : # denotes chapter number.

Course objectives and Course outcomes mapping:

- To introduce the basic concepts of software testing, its types: CO1, CO2
- To determine system acceptability: C04
- To use testing techniques and test automation tools so as to ensure delivery of quality software: CO3, CO5,CO6

Course units and Course outcomes mapping:

Unit No.	Unit	Course Outcomes					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Software Testing Fundamentals & Test Case generation	✓					
2	Structural and Functional Testing	✓	✓	✓			
3	Validation, System and Acceptance Testing	✓	✓	✓			
4	Application Test Automation and Tools	✓		✓	✓	✓	✓
5	Testing for Web Applications	✓	✓	✓			
6	Testing for Mobile Environment		✓	✓			

Programme Outcomes:

PO1: Ability to understand the concepts of key areas in computer science.
PO2: Ability to design and develop system, component or process as well as test and maintain it so as to provide promising solutions to industry and society.
PO3: Effective communication and presentation skill.
PO4: Ability to understand professional and ethical responsibility.
PO5: Recognition of the need for life-long learning.

Course Outcomes and Program Outcome Mapping:

Course Outcomes	Program outcome				
	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			
CO2				✓	
CO3	✓				
CO4			✓	✓	
CO5		✓			✓
CO6		✓	✓		✓

Modes of Transaction (Delivery):

Unit No	Topic Detail	Teaching Approach	P0 mapped
1,5,6	V-Model for testing and overview. User Interface testing : Navigation and form based Quality characteristics of Mobile testing	Group discussion (Students will be divided into two groups and discussion will be carried out) and Presentation	PO3, PO4, PO7
3,4	System Testing: Characteristics, benefits and application. Guidelines for test Automation	Open textbook study (Students shall be given questions and they have to find the answers and write it down in book)	PO4, PO7
6	Component testing : Activities, Services and ContentProvider	Hands-on by individual students.	PO1, PO2, PO3,P04, P05, PO6

Activities/Practicum:

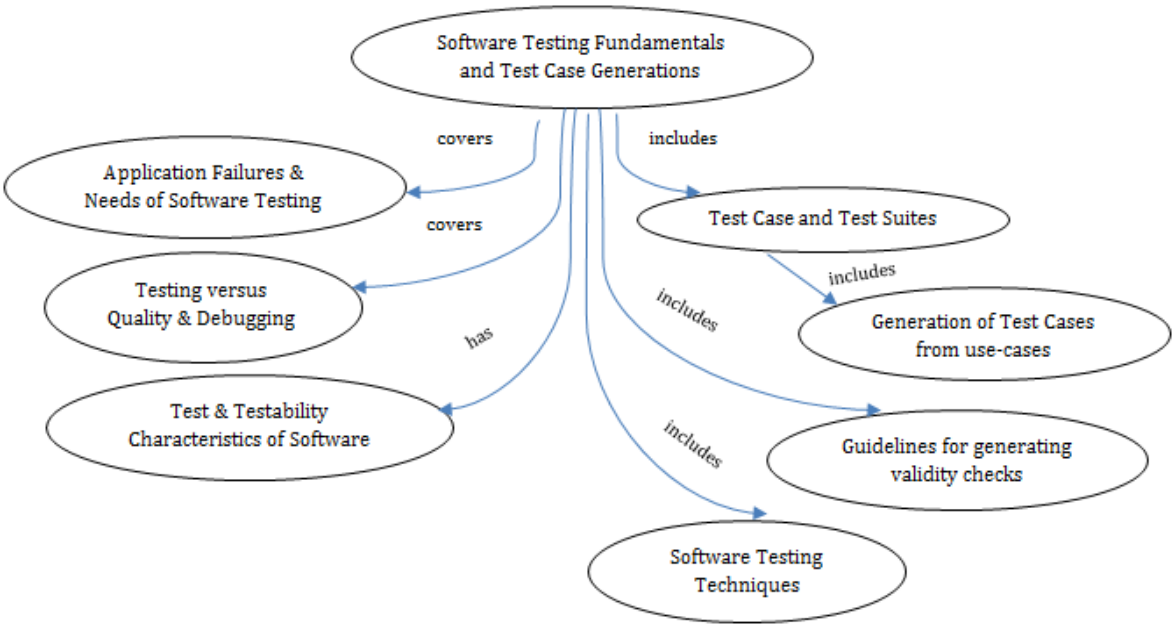
The following activities shall be carried out by the students.

Learner	Activities to be done	P0 mapped
For slow learners	Group of 3 students comprising of one advance learner and two slow learners will be made. After verify topic (like different testing types) by course teacher students will give demonstration of that topic.	PO4, PO7
For advanced learners	The topic will be assigned by course teacher and that team need to present the topic on every Wednesday. Case study will be given and students have to identify different types of testing techniques.	PO1, PO2, PO4, PO6, PO7
For all	To improve writing skill: Course teacher shall provide question based on previous lecture and students have to write answer on the spot.	PO2, PO6

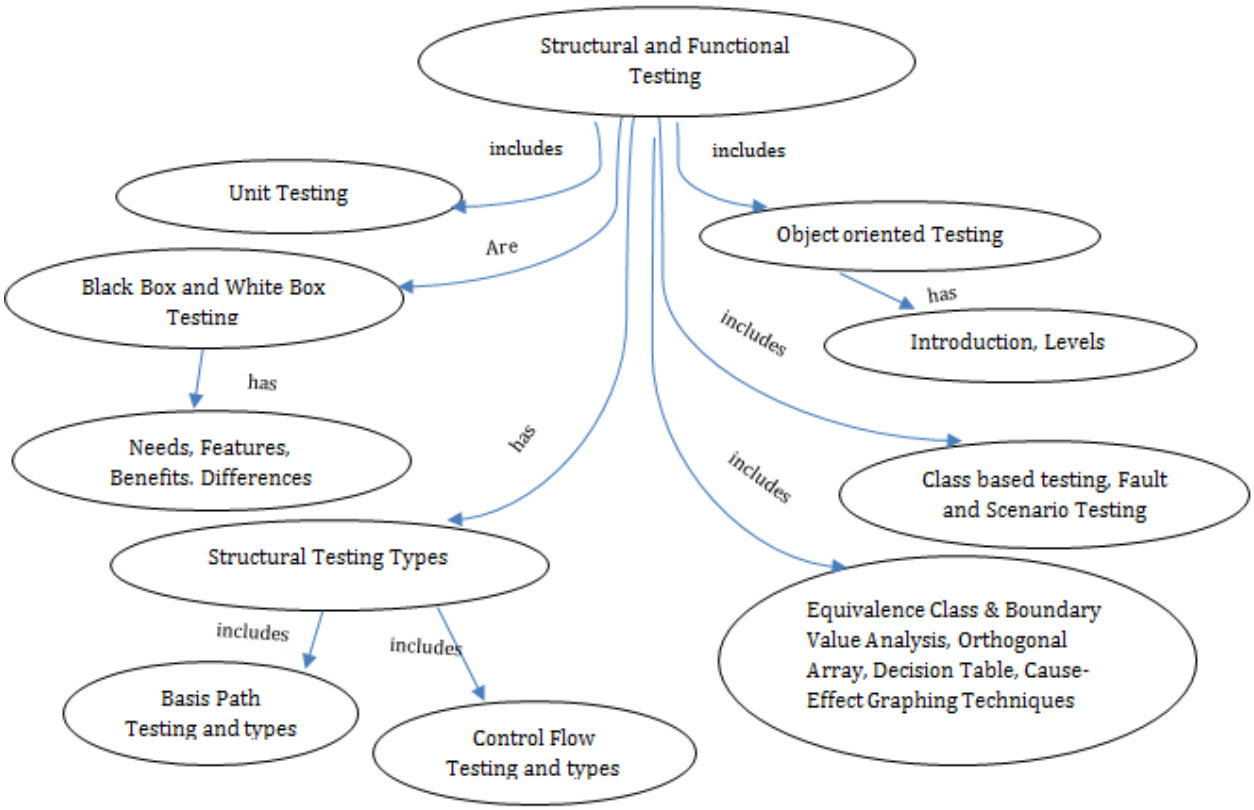
Number of Practical Problems in Journal: 17
Total sets to be developed for each division: 2

Unit Number	Number of Questions	Time required to implement and debug the question (in hours)	Minimum required of Journal Certification
Unit 1	1	4	1
Unit 2	6	12	5
Unit 3	3	8	3
Unit 4	2	6	2
Unit 5	4	10	4
Unit 6	2	8	2
Total	18	48	17

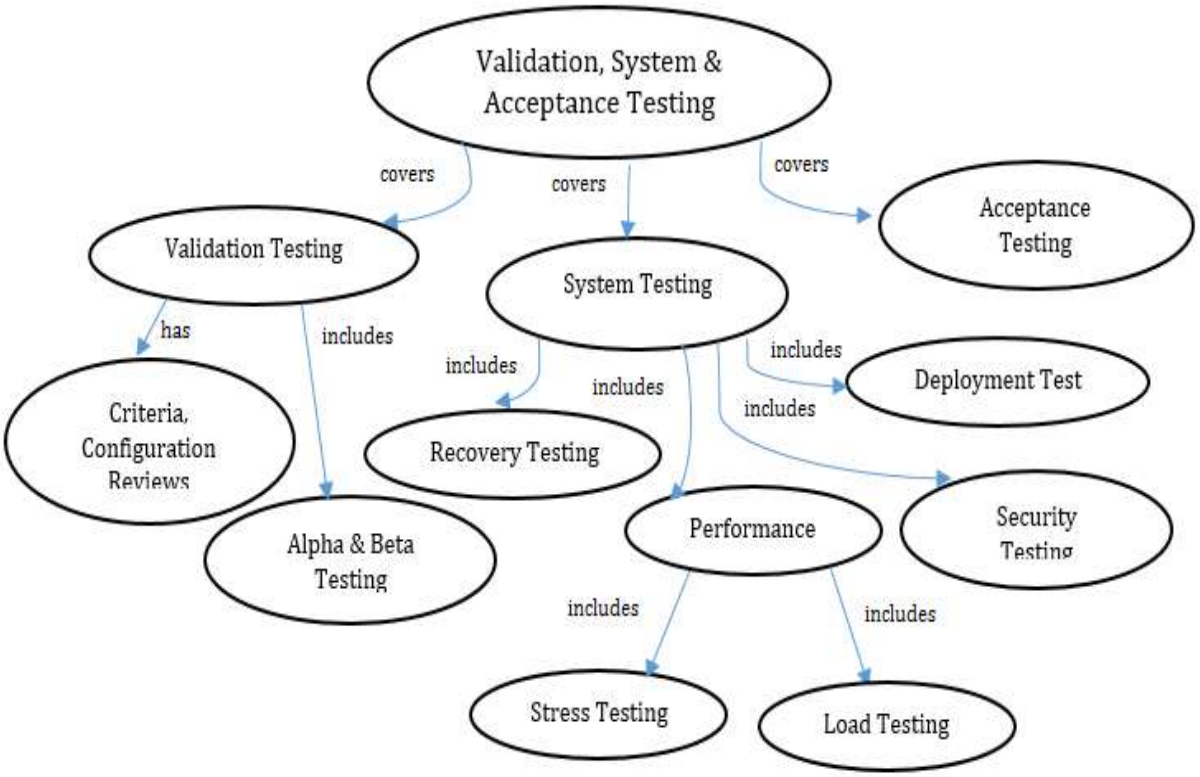
Concept map:
Unit– 1: Software Testing Fundamentals and Test Case Generation



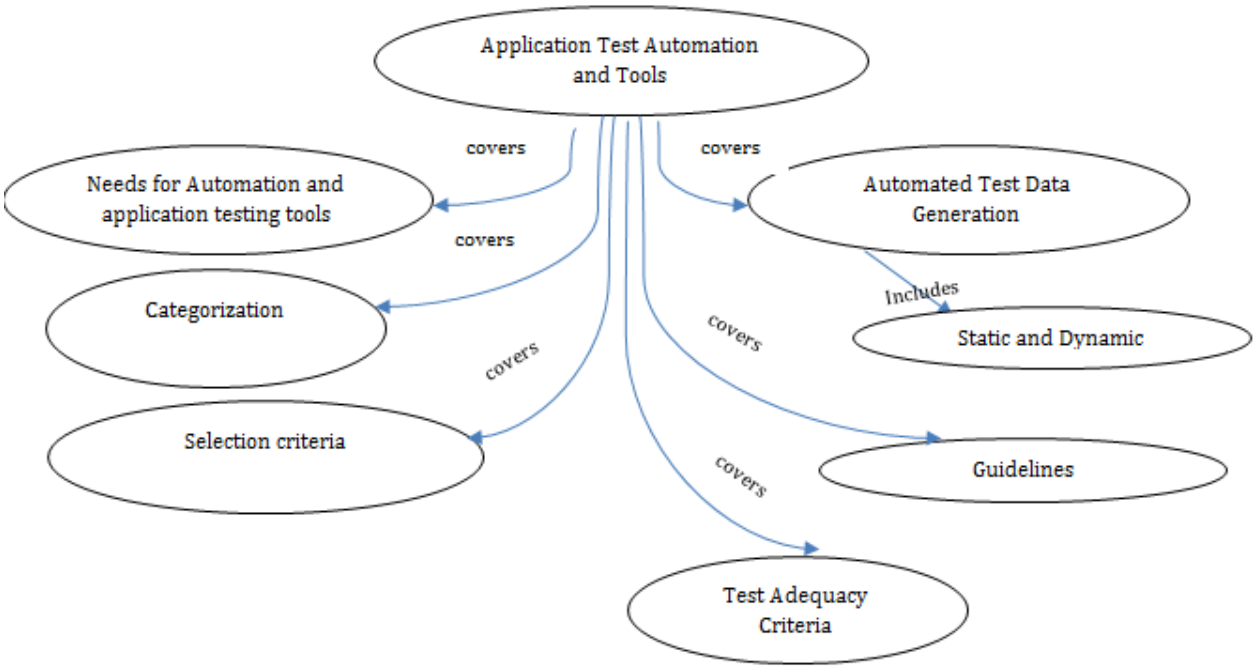
Unit-2 : Structural and Functional Testing



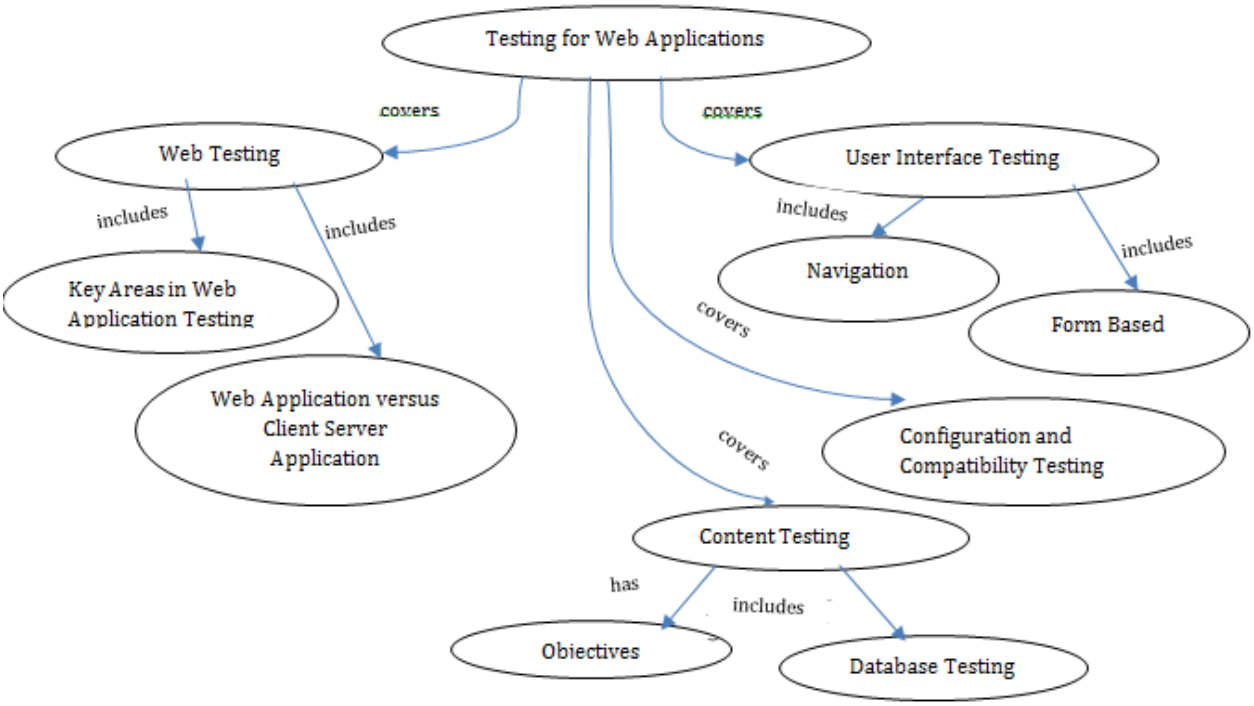
Unit-3: Validation, System and Acceptance Testing.



Unit 4 : Application Test Automation Tools



Unit 5: Testing for Web Applications



Unit 6: Testing For Mobile Environment