EASWARI ENGINEERING COLLEGE, CHENNAI-600 089
DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN

SUBJECT CODE : SE 7202

SUBJECT TITLE : SOFTWARE TESTING

HOURS DISTRIBUTION **:** (L T P C 3 0 0 3)

COURSE/ BRANCH : M.E. (SOFTWARE ENGINEERING)

SEMESTER : II

ACADEMIC YEAR : 2014 - 2015

FACULTY NAME : Dr.S.KANAGA SUBA RAJA

OBJECTIVE OF COURSE :

Software testing makes sure that the testing is being done properly and hence the system is ready for use. Good coverage means that the testing has been done to cover the various areas like functionality of the application, compatibility of the application with the OS, hardware and different types of browsers, performance testing to test the performance of the application and load testing to make sure that the system is reliable and should not crash or there should not be any blocking issues. It also determines that the application can be deployed easily to the machine and without any resistance. Hence the application is easy to install, learn and use.

OUTCOME OF COURSE :

Students who have completed this course would have learned

1. Various test processes and continuous quality improvement.
2. Methods of test generation from requirements.
3. Behavior modeling using UML: Finite state machines (FSM).
4. Test adequacy assessment using: control flow, data flow, and program mutations.
5. How to practically apply theory to design tests based on test criteria.

Sl. No.	Topic	No. of Periods	Ref Book	Pages
UNIT – I (9)				
Objectives: To know the behavior of the testing techniques to detect the errors in the software. To understand standard principles to check the occurrence of defects and its removal.				
1	World-Class Software Testing Model	1	R1	5-7
2	Building a Software Testing Environment	1	R1	19-22
3	Overview of Software Testing Process	1	R1	63-66
4	Organizing & Developing the Test Plan	1	R1	209-212
5	Verification Testing	1	R1	291-294
6	Analyzing and Reporting Test Results	1	Handout	
7	Acceptance Testing	1	R1	496-500
8	Operational Testing	1	R1	491-495
9	Post Implementation Analysis	1	R1	571-580
UNIT – II (9)				
Objectives: Test the software by applying testing techniques to deliver a product free from bugs. Evaluate the web applications using bug tracking tools.				
10	White Box Approach to Test design	1	Handout	
11	Static, Structural, Functional Testing	1	R1	238-240
12	Coverage and Control Flow Graphs	1	Handout	
13	Black Box Approaches to Test Case Design	1	R1	285-289
14	Random, Requirements, Decision tables	1	R1	180-183
15	Cause-effect graphing, Error guessing	1	R1	721-725
16	Levels of Testing	1	R1	431-436
17	Case study for White box testing	1	Handout	
18	Case study for Black box testing techniques	1	Handout	
UNIT – III (9)				
Objectives: Investigate the scenario and the able to select the proper testing technique. Explore the test automation concepts and tools. To know about various types of software testing.				
19	Testing Client/Server Systems	1	R1	621-625
20	Rapid Application Development Testing	1	R1	636-640

21	Testing SS Security OO Software Testing	1	Handout	
22	Testing Web based systems	1	R1	801-802
23	Web Technology Evolution	1	Handout	
24	Traditional Software and Web based Software	1	Handout	
25	Challenges in Testing for Web based Software	1	R1	327-333
26	Testing a Data Warehouse	1	R1	772-777
27	Case Study for Web Application Testing	1	Handout	

UNIT – IV (9)

Objectives:

To learn the functionality of automated testing tools.
To understand the models of software reliability.
Explore the test automation concepts and tools.

28	Selecting and Installing Software Testing Tools	1	R1	103-120
29	Software Test Automation	1	R1	579-580
30	Skills needed for Automation	1	R1	581-586
31	Scope of Automation	1	Handout	
32	Design and Architecture for Automation	1	Handout	
33	Requirements for a Test Tool	1	R1	690-691
34	Challenges in Automation	1	Handout	
35	Tracking the Bug Debugging	1	R1	325-326
36	Case study using Bug Tracking Tool	1	Handout	

UNIT – V (9)

Objectives:

Deliver quality product to the clients by way of applying standards such as TQM, Six Sigma.
Evaluate the estimation of cost, schedule based on standard metrics.

37	Testing Software System Security Six-Sigma	1	R4	61-65
38	TQM	1	R4	66-67
39	Complexity Metrics and Models	1	R4	67-76
40	Quality Management Metrics, Availability Metrics	1	Handout	
41	Defect Removal Effectiveness	1	R4	86-88
42	FMEA	1	R4	97-101
43	Quality Function Deployment	1	R4	101-108
44	Taguchi Quality Loss Function	1	R4	108-111
45	Cost of Quality Case Study for Complexity and Object Oriented Metrics	1	Handout	

ASSIGNMENT TOPICS

SL.NO	ASSIGNMENT TOPICS	SUBMISSION DUE
1	ASSIGNMENT I	**February 23 2015**
2	ASSIGNMENT II	**March 23 2015**

CONTENT BEYOND SYLLABUS

SL.NO	ADDITIONAL TOPICS
1	VOLVO TECHNOLOGY

REFERENCES

1. William Perry, “Effective Methods of Software Testing”, Third Edition, Wiley Publishing 2007
2. Srinivasan Desikan and Gopalaswamy Ramesh, “Software Testing – Principles and Practices”, Pearson Education, 2007.
3. NareshChauhan, “Software Testing Principles and Practices” Oxford University Press, New Delhi, 2010.
4. Dale H. Besterfiled et al., “Total Quality Management”, Pearson Education Asia, Third Edition, Indian Reprint (2006).
5. Stephen Kan, “Metrics and Models in Software Quality”, Addison – Wesley, Second Edition, 2004.
6. LleneBurnstein, “ Practical Software Testing”, Springer International Edition, Chennai, 2003.
7. RenuRajani,Pradeep Oak, “Software Testing – Effective Methods, Tools and Techniques”,Tata McGraw Hill,2004.
8. Edward Kit, “Software Testing in the Real World – Improving the Process”, Pearson Education, 1995.
9. Boris Beizer, “ Software Testing Techniques” – 2nd Edition, Van Nostrand Reinhold, New York, 1990
10. Adithya P. Mathur, “Foundations of Software Testing – Fundamentals algorithms and techniques”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008.

HOD **FACULTY**

Program Educational Outcomes

1. Graduates will be proficient in utilizing the fundamental knowledge of basic sciences and mathematics to the applications relevant to various streams of Engineering and Technology.
2. Graduates will possess core competencies necessary for application of knowledge of computers and telecommunications equipment to store, retrieve, transmit, manipulate and analyze data in the context of business enterprise.
3. Graduates will be capable of thinking logically, pursue lifelong learning and will have the capacity to understand technical issues related to computing systems and design optimal solutions.
4. Graduates will be able to develop hardware and software systems by understanding the importance of social, business and environmental needs in the human context.
5. Graduates will gain employment in organizations and establish themselves as professionals by applying their technical skills to solve real world problems and meet the diversified needs of industry, academia and research.
6. Graduates will be aware of professional ethics of the software industry and equip themselves with communication skills essential for working in community.

Program Outcomes

(a) Ability to apply knowledge of computing and mathematics appropriate to Information Technology

(b) Ability to analyze a problem, and identify computing requirements appropriate to its solution

(c) Ability to design, implement, and evaluate a system, process, component, or program to meet specific requirements

(d) Ability to interpret and synthesis data to provide valid conclusions

(e) Ability to function effectively as a team member to achieve a common goal

(f) Ability to understand professional, ethical and social issues and responsibilities

(g) Ability to communicate effectively with a diverse groups

(h) Ability to analyze the local and global impact of Information Technology on society

(i) Ability to recognize and engage in continuing professional development and lifelong learning

(j) Ability to use current techniques, skills, and tools necessary to accomplish projects related to Information Technology.

(k) Ability to understand the impact of the professional engineering solutions in societal and environmental contexts for sustainable development.

(l) Ability to understand engineering and management principles to manage projects in multidisciplinary environment.

MAPPING OF COURSE OUTCOMES WITH PEO & THE PROGRAMME OUTCOME-
(SE 7202 SOFTWARE TESTING)

UNITS	Course Outcomes	OB1	OB2	OB3	OB4	OB5	OB6	OCa	OCb	OCc	OCd	OCe	OCf	OCg	OCh	OCi	OCj	OCk	OCl
World-Class Software Testing Model – Building a Software Testing Environment - Overview of Software Testing Process – Organizing for Testing – Developing the Test Plan Verification Testing – Analysing and Reporting Test Results – Acceptance Testing – Operational Testing – Post Implementation Analysis	At the end, the student can able to Various test processes and continuous quality improvement	S	S	M	S	M	W	S	S	S	S	S	S	W	M	M	S	S	W
Using White Box Approach to Test design - Static Testing Vs. Structural Testing – Code Functional Testing – Coverage and Control Flow Graphs –Using Black Box Approaches to Test Case Design – Random Testing – Requirements based testing –Decision tables – State-based testing – Cause-effect graphing – Error guessing – Compatibility testing – Levels of Testing -Unit Testing - Integration Testing - Defect Bash Elimination. System Testing - Usability and Accessibility Testing – Configuration Testing - Compatibility Testing - Case study for White box testing and Black box testing techniques.	At the end, the student can able to Test adequacy assessment using: control flow, data flow, and program mutations.	S	S	S	S	M	W	S	S	S	M	S	S	W	M	M	S	S	W

Testing Client/Server Systems – Rapid Application Development Testing – Testing in a Multiplatform Environment – Testing Software System Security - Testing Object-Oriented Software – Object Oriented Testing – Testing Web based systems – Web based system – Web Technology Evolution – Traditional Software and Web based Software – Challenges in Testing for Web-based Software –Testing a Data Warehouse - Case Study for Web Application Testing. .	At the end, the student can able to Evaluate the web applications using bug tracking tools.	**S**	**S**	**S**	**M**	**S**	**W**	**S**	**S**	**S**	**S**	**S**	**S**	**W**	**M**	**M**	**S**	**S**	**M**
Selecting and Installing Software Testing Tools - Software Test Automation – Skills needed for Automation – Scope of Automation – Design and Architecture for Automation –Requirements for a Test Tool – Challenges in Automation – Tracking the Bug – Debugging – Case study using Bug Tracking Tool.	At the end, the student can able to Test the software by applying testing techniques to deliver a product free from bugs	**S**	**S**	**S**	**S**	**M**	**S**	**S**	**S**	**S**	**S**	**M**	**S**	**W**	**M**	**W**	**S**	**S**	**W**
Testing Software System Security - Six-Sigma – TQM - Complexity Metrics and Models – Quality Management Metrics - Availability Metrics - Defect Removal Effectiveness - FMEA Quality Function Deployment – Taguchi Quality Loss Function – Cost of Quality. Case Study for Complexity and Object Oriented Metrics.	At the end, the student can able to Deliver quality product to the clients by way of applying standards such as TQM, Six Sigma.	**S**	**S**	**S**	**S**	**M**	**S**	**S**	**S**	**S**	**M**	**S**	**S**	**W**	**S**	**M**	**S**	**S**	**W**

S->STRONG M->MEDIUM W->WEAK