MANIPAL INSTITUTE OF TECHNOLOGY

Manipal University, Manipal
Karnataka -576104

COURSE PLAN

Department : **COMPUTER SCIENCE AND ENGG**
Subject : **(CSE 421) SOFTWARE TESTING AND ANALYSIS**
Semester & branch : **VII B.E. CSE**
Name of the faculty : **Roshan David, Priya Kamath B., Deepthi S.**
No of contact hours/week : **4**

ASSESSMENT PLAN:

1. **In Semester Assessments - 50 %**
   - Written tests : 40%
   - Surprise quizzes : 10%

2. **End Semester Examination - 50 %**
   - Written examination of 3 hours duration (Max. Marks: 50)

Portions for Assignment	
Assignment no.	**Topics**
1	**L1-L7**
2	**L8-L14**
3	**L15-L24**
4	**L25-L30**
5	**L31-L40**
Portions for Sessional Test	
Test no.	**Topics**
1	**L1-L17**
2	**L18-L35**

Course Plan

L. No.	Topics
L0	Introduction
L1	Software Test and Analysis in a nut shell, SDLC, Engineering Processes.
L2	Verification and Validation
L3	Degrees of freedom, varieties of software, Basic principles
L4	Functional Testing overview
L5	Boundary value analysis
L6	Equivalence Class partitioning
L7	Decision table based testing
L8	Design of test cases
L9	Statement testing
L 10	Branch and condition testing
L11	Testing decision structures
L12	Path and procedural call testing
L 13	Comparing structural testing criteria, infeasibility problem
L 14	Dependence and data flow models- DU pairs
L 15	Data flow analysis
L16	D- use associations, data flow testing criteria
L 17	Control flow graphs
L18	Deriving test cases from control and data flow graphs
L19	Data flow coverage, infeasibility problem
L 20	Test Adequacy Assessment Using Program Mutation: Introduction, Mutation and Mutants
L 21	Test Assessment Using Mutation
L 22	Mutation operators
L23	Tutorials on Mutation testing
L 24	Test Execution: From test case specifications to test cases, Scaffolding
L25	Generic Vs specific scaffolding, test oracles

L 26	Self-checks as oracles, capture and replay
L27	Finite models- overview, finite abstractions of behaviour.
L 28	Calls graphs, FSM
L29	Deriving test cases from grammars
L 30	Tutorial on MBT
L31	Issues in testing object oriented software, orthogonal approach to test
L32	Intra Class testing, testing with state machine models
L33	Interclass testing, Structural testing of classes.
L 34	Oracles for classes
L 35	Polymorphism and dynamic binding
L 36	Inheritance, genericity, exceptions
L 37	Classic analysis
L 38	Execution to conservative flow analysis
L 39	Data flow analysis with arrays and pointers
L 40	Inter-procedural Analysis
L 41	Test specification and cases
L 42	Adequacy criteria
L 43	Comparing criteria
L 44	Infeasibility problem
L 45	Symbolic execution in Program analysis, Symbolic testing
L 46	Summarizing execution paths
L 47	Memory analysis, lockset analysis
L 48	Extracting behaviour models from execution

References:

1. Software Testing and Analysis: Process, Principles and Techniques- Mauro Pezze, Michal Young, John Wiley and Sons, 2008.
2. Foundations of Software Testing- Adithya P Mathur, Pearson Education, 2008.
3. Software Testing Principles and Practices- Gopalaswamy Ramesh, Srinivasan Desikan, 2nd Edition, Pearson, 2007.

4. Software Testing –Ron Patton, 2nd Edition, Pearson Education, 2004.
5. Software Testing: A Craftsman's Approach, Auerbach Publications, 2008.
6. The craft of Software Testing- Brian Marrick, Pearson Education, 1995.

Submitted by: Roshan David

(Signature of the faculty)

Date: 30-07-2015

Approved by:

(Signature of HOD)

Date:

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