4/4 B.Tech. FIRST SEMESTER

IT7T1 SOFTWARE TESTING METHODOLOGIES Credits: 4

(Common to CSE/IT)

Lecture: 4 periods/week **Internal assessment: 30 marks**
Tutorial: 1 period /week **Semester end examination: 70 marks**

Objectives:

To provide a thorough understanding of

- The need for testing, types of bugs and their consequences.
- Path testing and its applications.
- Two forms of functional or system testing namely Transaction Flow Testing and Data Flow Testing.
- Domain testing and its implementation.
- Paths of various flow graphs, their interpretations and applications.
- Logic based testing and its implementation.
- State graphs and transition testing.
- matrix of a graph and node reduction algorithms.

Outcomes:

The student will be able to

- Understand the importance of testing and debugging.
- Interpret a model for testing and understand the process of testing and its limitations.
- Understand the path testing and selection criteria and their limitations.
- Understand the path sensitizing method and classify whether the path is achievable or not.
- Visualize the transaction flow and data flow in a software system.
- Learn the domain testing strategy for different dimension domains.
- Understand the concept of Logic based testing.
- Understand and interpret KV Charts and know their limitations.
- Understand and interpret State Graphs ,Transition testing and Graph Matrices.

Syllabus

UNIT – I
Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.
UNIT - II
Flow graphs and Path testing: Basics concepts, predicates, path predicates ,achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT - III
Transaction Flow Testing: Transaction flows, transaction flow testing techniques.
Dataflow testing: basics, strategies in dataflow testing, application of dataflow testing.

UNIT - IV
Domain Testing: domains and paths, Nice & ugly domains, domain testing, domain and interface testing, domains and testability.

UNIT - V
Paths, Path products and Regular expressions: Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

UNIT - VI
Logic Based Testing: Overview, decision tables, path expressions, kv charts, specifications.

UNIT - VII
State, State Graphs and Transition testing: State graphs, good & bad state graphs, state testing, Testability tips.

UNIT - VIII
Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

Text Books :
1. Software Testing techniques - Boris Beizer, Dreamtech, second edition.

Reference Books:
1.Software Testing Techniques – SPD(Oreille).
2.Software Testing in the Real World – Edward Kit, Pearson.
3.Effective methods of Software Testing, Perry, John Wiley.