# GANPAT UNIVERSITY

## FACULTY OF ENGINEERING & TECHNOLOGY

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|---|---|---|---|
| Programme | Bachelor of Technology | Branch/Spec. | Computer Engineering/Information Technology |
| Semester | VI | Version | 2.0.0.0 |
| Effective from Academic Year | 2020,21 | Effective for the batch Admitted in | July 2018 |
| Subject code | 2CEIT6PE2 | Subject Name | Software Validation & Testing |

| Teaching scheme | | | | | | Examination scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|---|---|
| (Per week) | Lecture (DT) | | Practical (Lab.) | | Total | | CE | SEE | Total |
| | L | TU | P | TW | | | | | |
| Credit | 3 | 0 | 1 | , | 4 | Theory | 40 | 60 | 100 |
| Hours | 3 | 0 | 2 | , | 5 | Practical | 30 | 20 | 50 |

**Prerequisites:**

Software Engineering Basics

Objectives of the course:

1. To understand the basics of testing, test planning & design and test team organization.
2. To study the various types of test in the life cycle of the software product.
3. To build design concepts for system testing and execution.
4. To learn the software quality assurance, metrics, defect prevention techniques.
5. To learn the techniques for quality assurance and applying for applications.

Theory syllabus

| Unit | Content | Hrs |
|---|---|---|
| 1 | **Introduction to Testing:** What is Testing, Software Testing Principles, Role of Tester, Testing As A Process, Overview of Testing Maturity Model, Defects, Hypothesis and Tests | 5 |
| 2 | **Black Box Testing Strategies:** Black Box Testing Techniques, Random Testing, Equivalent Partitioning, Boundary Value Analysis (BVA), Equivalence Class Testing, State Transition Testing, Cause, Effect Graphing Based Testing, Error Guessing, Black Box TMM Maturity Goals | 6 |
| 3 | **White Box Testing Strategies:** White, Box Testing Techniques, Test Adequacy Criteria : Coverage and Control Flow Graphs, Basis Path Testing,, Loop Testing, Data Flow Testing, Mutation Testing Evaluating Adequacy :White Box and TMM Levels | 6 |
| 4 | **Unit Testing Strategies:** Unit Testing : Need, Functions, Plan :Design, Considerations : Test Harness, Integration Testing, Goals, Strategies, Design, Plan, System Testing | 6 |
| 5 | **Function Test Strategies:** Function Test, Performance Test, Stress Test, Configuration Test, Security Test : Recovery Test, Regression Testing, Alpha, Beta, Acceptance Test, Special Role Of Use Cases, Levels Of Testing and TMM | 6 |
| 6 | **Testing Policies:** Test Planning, Components, Attachments, Locating Test Items, Test Reports, Role Of Three Critical Groups, Building A Test Group, Structure, Technical Training, Career Paths, Certification, Integrating Testing Activities | 5 |
| 7 | **Software Quality:** Quality Concepts, Cost Estimation, Quality Control, Role Of Operational Profiles and Usage Models, Statistical Testing, Software Reliability :Measurements, Applying Reliability Models, Confidence Level, Usability Testing, Software Quality Control and Critical Views | 6 |
| 8 | **Test Automation:** Software Test Automation : Skills Requirement For Automation : Scope of Automation : Design and Architecture for Automation : Requirements for A Test Tool : Challenges in Automation : Test Metrics and Measurements : Project, Progress and Productivity Metrics | 5 |

| Practical content | |
|---|---|
| Experiments/Practical's/Simulations would be carried out based on syllabus<br>Software Testing (Manual and Automated) | |
| Text Books | |
| 1 | Srinivasan Desikan and Gopalaswamy Ramesh, "Software Testing : Principles and Practices", Pearson Education. |
| 2. | Ron Patton, "Software Testing", Sams Publishing, Pearson Education. |
| Reference Books | |
| 1 | Naresh Chauhan, Software Testing Principles and Practices, Oxford University Press. |
| 2 | C. J. Paul, Software testing: A craftsmen's approach, CRC Press, CRC Press. |
| 3 | G. J. Myers, The art of software testing, Wiley Interscience New York. |
| 4 | Software Testing And Quality Assurance, Theory and Practice, Kshirasagar Nak Priyadarshi Tripathy, John Wiley & Sons Inc. |
| ICT/MOOCs Reference | |
| 1 | https://swayam.gov.in/nd1_noc19_cs71/preview |
| 2 | https://www.edx.org/course/software-testing-fundamentals |
| Course Outcomes: | |
| After successful completion of this course, student will be able to<br>1. Understand the role of tester<br>2. Apply mathematical logic for testing<br>3. Choose appropriate testing strategies<br>4. Communicate effectively with developers and other stakeholders<br>5. Check and verify the Quality standards | |