

# GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: III

Computer Science & Engineering

Subject Name **Software Engineering Methodology (Major Elective IV)**

Sr. No	Course content
1.	<b>Testing:</b>  Strategic approach to software testing, Strategic issues, Test Strategies for conventional software, Test Strategies for Object oriented software, Validation testing, System testing, Art of debugging, Software testing fundamentals, Black box and white box testing, Basis path testing, control structure testing, object oriented testing methods, Testing method applicable at class level, Inter class test case design, Testing for specialized environments, architecture and applications, Testing patterns
2.	<b>Product Metrics;</b>  Software quality, A framework for product metric, Metrics for the Analysis model, Metrics for the Design model, Metrics for Source code, Metrics for testing, Metrics for maintenance..
3.	<b>Web engineering:</b>  Attributes of web based systems and applications, Webapp engg. Layers, the web engg. Process, web engg. Best practices, Formulating web based systems, planning for web engg. Project, The web engg. Team, project management issues for web engg., Metrics for web engg. And Webapps, Worst practices for webapp projects, Requirement analysis for Webapps, The analysis model for Webapps, The content model, The Interaction model, The functional model, The configuration model, Relationship-Navigation analysis, Design issues for web engg.The webE design pyramid, webapp interface design, aesthetic design, content design, architecture design, navigation design, component level design, hyper media design patterns, object oriented hyper media design methods(OOHDM), design metrics for webapps, Testing concepts for webapps, The testing process, Content testing, UI testing, Component level testing, Navigation testing, Configuration testing, security testing, performance testing.
4.	<b>Managing Software project:</b>  The management spectrum, The people, The product, The process, The project, The W5HH principle, critical practices, Metrics in the process and Project domains software measurement, Metrics for software quality, Integrating metrics within the software process, metrics for small organization, Establishing a software metrics program, Observation on estimation, The project planning process, Software scope and feasibility, Resources, Software project estimation, Decomposition techniques, Empirical estimation models, Estimation for object oriented projects, Specialized estimation techniques, The make / buy decision.

5.	<b>Scheduling:</b>  Basic concepts, Project scheduling, Defining a task set for the software project, Defining a task network, Scheduling, Earned value analysis.
6.	<b>Risk management:</b>  Reactive v/s Proactive risk strategies, Software risks, Risk identification, Risk projection, Risk refinement, Risk mitigation, monitoring, and management, The RMMM plan,
7.	<b>Quality Management:</b>  Quality concept, software Quality assurance, software reviews, formal technical reviews, formal approaches to SQA, Statistical SQA, Software reliability, ISO 9000 Quality standards, SQA plan.
8.	<b>Change management:</b>  Software configuration management, SCM repository, SCM process, Configuration management for web engg.
9.	<b>Advanced topics in Software Engineering:</b>  Formal methods – Basic concepts, Clean room software engg., - The clean room approach, functional specification, Component based development – Engineering of CBSE, CBSE process, Reengineering – Business process reengineering, software reengineering

### **Reference Books:**

1. Software Engineering: A Practitioner's Approach, 6/e, Roger S Pressman, McGraw Hill, 2005
2. Software Engineering, Ian Sommerville, 8th Edition, Addison-Wesley, 2006