

Course Objective: To introduce fundamentals of software engineering including requirement specifications, software design, testing and maintenance

S. No	Course Outcomes (CO)
CO1	A general understanding of software process models such as the waterfall and evolutionary models.
CO2	To be able to decompose the given project in various phases of a lifecycle.
CO3	Understanding of software requirements and the SRS documents.
CO4	To perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance
CO4	To apply the knowledge, techniques, and skills in the development of a software product.

S. No	Contents	Contact Hours
UNIT 1	Introduction: Introduction to software Engineering, Software characteristics, Software components, Software applications, Software Engineering Principles, Software metrics and measurement, monitoring and control. Software development life-cycle, Water fall model, prototyping model, Incremental model, Iterative enhancement Model, Spiral model, Agile Model.	8
UNIT 2	Software Requirement Specification: Requirements Elicitation Techniques, Requirements analysis, Models for Requirements analysis, Requirements specification, and requirements validation.	8
UNIT 3	System Design: Design Principles: Problem partitioning, abstraction. Top down and bottom up – design, structured approach. Functional versus object oriented approach of design, design specification, Cohesiveness and Coupling. Overview of SA/SD Methodology, structured analysis, data flow diagrams, extending DFD to structure chart, Entity-Relationship diagram, Use case diagrams.	8
UNIT 4	Software project Management: Project planning and Project scheduling and Resource Management including Gantt charts and critical path method (CPM). Software Metrics: Size Metrics like LOC, Token Count, and Function Count. Cost estimation using models like COCOMO. Risk Management activities. Software Reliability and Quality Assurance: Reliability issues, Reliability metrics, reliability models, Software quality, ISO 9000 certification for software industry, SEI capability maturity model, Agile Project Management	10
UNIT 5	Testing: Verification and validation, code inspection, test plan, test case specification. Level of testing: Unit, Integration Testing, Top down and bottom up integration testing, Alpha and Beta testing, System testing and debugging, functional testing, structural testing, Software testing strategies.	8
UNIT 6	Software Maintenance: Structured Vs unstructured maintenance, Maintenance Models, Configuration Management, Reverse Engineering, Software Re-engineering.	6
Total		48