

Code:	CC-VIII	Software Engineering	3L+T:0P	3 Credits (45 hours theory)
BCA-3003T				
Max Marks: 100; Theory (Int: 25; Ext: 75)				
Course Outcomes: Upon completion of the course, students will be able to				
CO 1. Acquire a comprehensive understanding of the software development lifecycle and its application in contemporary software engineering practices.				
CO 2. Develop proficiency in project management methodologies and strategic decision- making for successful software project execution.				
CO 3. Master the art of software design, development, and testing to produce robust and efficient software solutions.				
Unit	Topics			Proposed Lecture
I	The Evolving Role of Software, Changing Nature of Software, Layered Technology, A Process Framework, Process Models: Waterfall Model, Incremental Process Models, Evolutionary Process Models, Unified Process. Spiral Model. Agile Software Development: Agility Principles, Agile Methods, Plan-Driven and Agile Development, Extreme Programming, Scrum, A Tool Set for The Agile Process.			12
II	Software Requirements Engineering: Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Requirements Engineering Processes, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management. Risk Management: Reactive Vs Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, RMMM, RMMM Plan. Project Planning- Software Pricing, Plan-Driven Development, Project Scheduling, Agile Planning, Estimation Techniques.			12
III	Design: Design Process and Design Quality, Design Concepts, The Design Model, Software Architecture, Data Design, Architectural Design, Basic Structural Modeling, Class Diagrams, Sequence Diagrams, Collaboration Diagrams, Use Case Diagrams, Component Diagrams. Software Implementation-Relationship Between Design and Implementation: Implementation Issues and Programming Support Environment; Coding the Procedural Design, Coding Style and Review of Correctness and Reliability. Testing Strategies: A Strategic Approach to Software Testing, Test Strategies for Conventional Software, Black-Box and White-Box Testing, Validation Testing, System Testing, The Art of Debugging. Product Metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.			11
IV	Quality Management: Quality Concepts, Software Quality Assurance, Software Reviews, Formal Technical Reviews, Statistical Software Quality Assurance, Software Reliability. Release Management: Release Planning, Development and Build Plans, Release Strategies, Risk Management, And Post-Deployment Monitoring. Product Sustainance: Maintenance, Updates, End of Life, Migration Strategies.			10
Text Books:				
1. Somerville, Ian. <i>Software Engineering</i> . 10th ed., Pearson Education, 2015.				
2. Pressman, Roger S., and Bruce R. Maxim. <i>Software Engineering: A Practitioner's Approach</i> . 8th ed McGraw Hill Education, 2015.				
3. Gill, N.S. <i>Software Engineering</i> . Khanna Publishing House, 2023.				
4. <i>Fundamentals of Software Engineering</i> , Rajib Mall, PHI				