SOFTWARE ENGINEERING
(Common to CSE&IT)

III B. Tech. - I Semester	L	T	P	C
Course Code: A3CS21	4	1	-	4

COURSE OVERVIEW:

Software Engineering comprises the core principles consistent in software construction and maintenance: fundamental software processes and life-cycles, mathematical foundations of software engineering, requirements analysis, software engineering methodologies and standard notations, principles of software architecture and re-use, software quality frameworks and validation, software development, and maintenance environments and tools. An introduction to object-oriented software development process and design.

COURSE OBJECTIVES:

1. To familiarize with basic Software engineering methods and practices, and its applications.
2. To explain layered technology in software engineering
3. To teach software metrics and software risks.
4. To familiarize with software requirements and the SRS documents.
5. To facilitate students in software design

COURSE OUTCOMES:

At the end of the course the students are able to:

1. Analyze the requirements
2. Categorize requirements and design SRS
3. Apply software engineering principles and techniques.
4. Design and evaluate large-scale software systems.
5. Demonstrate ethical standards and legal responsibilities.
6. Identify suitable process model for a given software requirement

SYLLABUS

UNIT - I

INTRODUCTION TO SOFTWARE ENGINEERING: The Evolving nature of software engineering, Changing nature of software engineering, Software engineering Layers, The Software Processes, Software Myths.

PROCESS MODELS: A Generic Process Model, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Spiral Model, The Unified Process, Personal and Team Process Models, the Capability Maturity Model Integration (CMMI).

UNIT - II

REQUIREMENTS ENGINEERING: Functional and Non-Functional Requirements, The Software requirements Document, Requirements Specification, requirements Engineering, Requirements Elicitation and Analysis, Requirement Validation, Requirement Management, System Modelling: Context Models, Interaction Models, Structural Models, Behavioural Model, Model-Driven Engineering.

DESIGN CONCEPTS: The Design Process, Design Concepts, The Design Models And Architectural Design: Software Architecture, Architectural Genres, And Architectural Styles.

UNIT - III

DESIGN AND IMPLEMENTATION: Design Patterns, Implementation Issues, Open Source Development. User Interface Design: The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

SOFTWARE TESTING STRATEGIES: A Strategic approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Validation Testing, System Testing, The Art of Debugging, White-Box Testing, Black Box Testing.

UNIT - IV

PRODUCT METRICS: A Frame Work for Product Metrics, Metrics for the Requirements Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing.

PROCESS AND PROJECT METRICES: Metrics in the Process and Project Domains, Software Measurements, Metrics for Software Quality, Risk Management: Risk verses Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinements, Risk Mitigation Monitoring and Management (RMMM), The RMMM Plan.

UNIT - V

OVERVIEW OF QUALITY MANAGEMENT AND PROCESS IMPROVEMENT: Overview of SEI - CMM, ISO 9000, CMMI, PCMM, TQM and Six Sigma.

OVERVIEW OF CASE TOOLS: Software tools and environments: Programming environments; Project management tools; Requirements analysis and design modelling tools; testing tools; Configuration management tools;

TEXT BOOKS:

1. Roger S. Pressman (2011), Software Engineering, A Practitioner's approach, 7th edition, McGraw Hill International Edition, New Delhi.
2. Sommerville (2001), Software Engineering, 9th edition, Pearson education, India.

REFERENCE BOOKS:

1. K. K. Agarval, Yogesh Singh (2007), Software Engineering, 3rd edition, New Age International Publishers, India.
2. Lames F. Peters, Witold Pedrycz (2000), Software Engineering an Engineering approach, John Wiely & Sons, New Delhi, India.
3. Shely Cashman Rosenblatt (2006), Systems Analysis and Design, 6th edition, Thomson Publications, India.