III Year –II SEMESTER   T   P   C
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Software Engineering

Course Objectives:
The students will have a broad understanding of the discipline of software engineering and its application to the development of and management of software systems.

Course Outcomes:
1. knowledge of basic SW engineering methods and practices, and their appropriate application;
2. general understanding of software process models such as the waterfall and evolutionary models.
3. understanding of the role of project management including planning, scheduling, risk management, etc.
4. understanding of software requirements and the SRS document
5. understanding of different software architectural styles.
6. understanding of implementation issues such as modularity and coding standards.
7. understanding of approaches to verification and validation including static analysis, and reviews.
8. understanding of software testing approachs such as unit testing and integration testing
9. understanding of software evolution and related issues such as version management.
10. understanding on quality control and how to ensure good quality software.
11. understanding of some ethical and professional issues that are important for software engineers
12. **development of significant teamwork and project based experience**

Syllabus:

UNIT I:
Introduction to Software Engineering: Software, Software Crisis, Software Engineering definition, Evolution of Software Engineering Methodologies, Software Engineering Challenges.
Software Processes: Software Process, Process Classification, Phased development life cycle, Software Development Process Models- Process, use, applicability and Advantages/limitations

UNIT II:
Requirements Engineering: Software Requirements, Requirements engineering Process, Requirements elicitation, Requirements Analysis, Structured Analysis, Data Oriented Analysis, Object oriented Analysis, Prototyping Analysis, Requirements Specification, Requirements Validation, requirement Management.

UNIT III:
Software Design: Software Design Process, Characteristics of Good Software Design, Design Principles, Modular Design, Design Methodologies, Structured Design, Structured Design Methodology, Transform Vs Transaction Analysis.
Object-Oriented Design: Object oriented Analysis and Design Principles

UNIT IV:
Implementation: Coding Principles, Coding Process, Code verification, Code documentation
Software Testing: Testing Fundamentals, Test Planning, Black Box Testing, White Box Testing, Levels of Testing, Usability Testing, Regression testing, Debugging approaches

UNIT V:
Software Project Management: Project Management Essentials, What is Project management, Software Configuration Management.
Project Planning and Estimation: Project Planning activities, Software Metrics and measurements, Project Size Estimation, Effort Estimation Techniques.

UNIT VI:
Software Quality: Software Quality Factors, Verification & Validation, Software Quality Assurance, The Capability Maturity Model
Software Maintenance: Software maintenance, Maintenance Process Models, Maintenance Cost, Reengineering, Reengineering activities, Software Reuse.

TEXT BOOKS:
1. Software Engineering, concepts and practices, Ugrasen Suman, Cengage learning
2. Software Engineering, 8/e, Sommerville, Pearson.
3. Software Engineering, 7/e , Roger S.Pressman , TMH

REFERENCE BOOKS:
1. Software Engineering, A Precise approach, Pankaj Jalote, Wiley
2. Software Engineering principles and practice, W S Jawadekar, TMH
3. Software Engineering concepts, R Fairley, TMH