# Paper Name: SOFTWARE ENGINEERING

## 1. Learning Outcome

On successful completion of this course, the student should be able to:

- Determine the primary problems that impact all software development processes.
- Choose relevant software development processes models, methodologies, and strategies for managing a specific software development process, and justify the choices
- Implement different software estimation metrics such as cost, effort size, staffing etc.
- Describe various software design approaches and various coding, and testing strategies used in software engineering principles

2. **Prerequisite:** Nil
3. **Semester: VI**
4. **Course Type: Compulsory**
5. **Course Level: 100-199**
6. **Theory Credit:** 4
7. **Practical Credit:** 0
8. **Number of required hours:**
   p) Theory: 60 hrs
   q) Practical: 0 hrs
   r) Non Contact: 5 hrs

## 9. List of reference books

a) Rajib Mall: *Fundamentals of Software Engineering*; PHI Learning Pvt. Ltd.

b) Roger S. Pressman: *Software Engineering: A practitioner's Approach*; McGraw Hill.

| Unit no. | Unit content | No.of classes |
|---|---|---|
| 1 | **Introduction**<br>Definition of Software Engineering, differentiation between Computer Science, Software Engineering and System Engineering, Program V/s software product, Exploratory style and modern style of software development, need of software engineering, characteristics of good software product | 8 |
| 2 | **Software Development Life Cycle models**<br>Definition of software development Life cycle models, Various life cycle modes: Classical Waterfall model, Iterative Waterfall model, Prototyping model, Evolutionary (Incremental) model, Spiral model, Advantages and disadvantages of each of these cycle models. | 10 |
| 3 | **Software specification and Project Management**<br>Concept and Importance of Feasibility Study in Software design, Types of Feasibility: *Technical*, *Economical* and *Operational* feasibility, Requirement | 14 |

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| | gathering and Analysis process, Components of an SRS (Software Requirement Specification), Properties of a good SRS, Different users of SRS, Basic idea of Software Project Management, Job Responsibilities of a Software Project Manager, Need of SPMP (Software Project Management Plan) document, Need of Software documentation, Internal and External documentation, Software size estimation using Lines of Code (LOC), Merits and Demerits of LOC metric. | |
| 4 | **Software Design principles and Methodology**<br><br>Top down and bottom up approach, External Design, Architectural Design and Detailed design, Concept of Cohesion in software design, Classification of Cohesion, Basic concept of Coupling, Classification of Coupling, Introduction to software Analysis and Software Design (SA/SD), Introduction to Data Flow Diagram, Symbols used in DFD, Context Diagram in DFD, Advantages and Disadvantages of DFDs. | 14 |
| 5 | **Coding and Testing**<br>Goals of coding, Code Review techniques: Code Walkthrough, Code Inspection, Definition of Test cases, test suits, negative testing and positive testing. Different levels of software testing: unit testing, Integration Testing, System Testing and acceptance testing. Basic concept of Black box testing approach, Idea of White Box testing approach, Statement Coverage, Branch Coverage approach | 14 |

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