Software Engineering (Code: CSE3122)

B. Tech CSE 5th Sem.

(School of Computer Engineering)

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CSE3122 - Software Engineering

- **Subject Code : CSE 3122**
- **CREDITS : 03**
- **Number of Lecture Hours/Week : 03**
- **Number of Modules : 7**
- **Total Number of Lecture Hours : 36**

CSE3122 - Software Engineering

Course Objectives

1. To illustrate how a given problem can be broken down into different modules.
2. To demonstrate the SDLC model.
3. To develop DFD and structure chart
4. To construct UML diagrams
5. To comprehensive knowledge and practical skills in software coding and testing

CSE3122 - Software Engineering

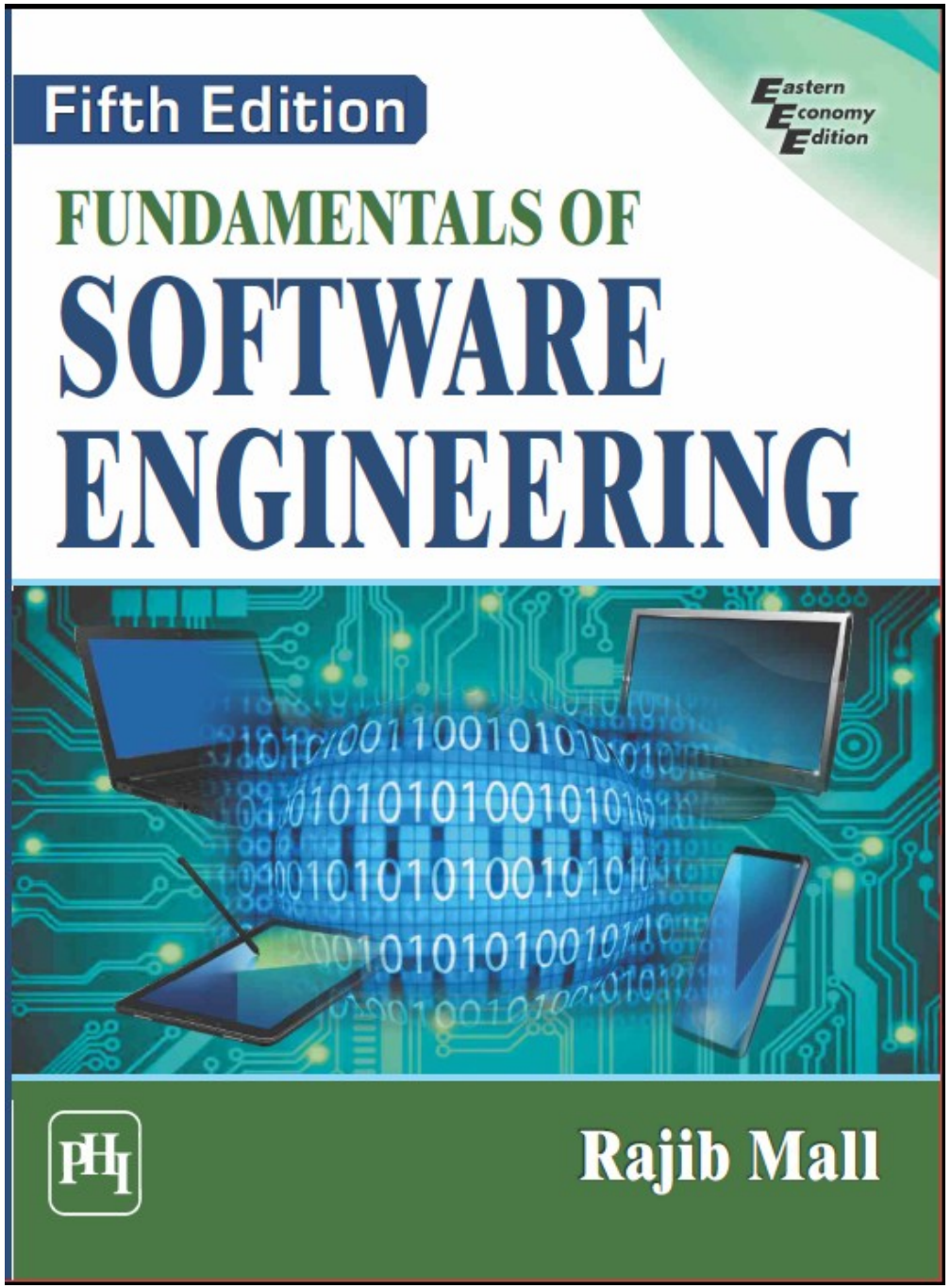
Course Outcomes (CO):

After studying this course, students will be able:

1. To understand basic concepts and life cycle models
2. To analyze the requirements of the project
3. To model and design the project
4. Understand the analysis and design of the project using UML
5. Ability to use standards in coding and testing

Text Books

1. **Rajib Mall, Fundamentals of Software Engineering (5th edition), PHI Learning, 2019**



Reference Book/Materials

1. Hans Van Vliet, Software Engineering: Principles and Practice (3e), Wiley India, 2012.
2. Roger S. Pressman, Software Engineering - A Practitioner's Approach (7e), McGrawHill International Edition, 2010.
3. Bernd Bruegge, Allen H. Dutoit, Object-Oriented Software Engineering using UML Patterns and Java (2e) , Pearson Publication, 2011.
4. Ian Sommerville, Software Engineering (9e), Addison-Wesley, **2011.**
5. Nooper Davis, Secure Software Development Life Cycle Processes, Software Engineering Institute, Carnegie Mellon University, 2013.
6. Julie Cohen, Dan Plakosh, Kristi Keeler, Robustness Testing of Software-Intensive Systems: Explanation and Guide, Carnegie Mellon University, **2005.**
7. Online material (preferably www.**tutorialspoint**.com)

CSE3122 - Software Engineering (Course Syllabus)

Module No. 1 (Introduction:) 3 Hours

Evolution from an art form to an engineering discipline, Software development Projects, Exploratory style of software development, Emergence of software Engineering, Notable changes in software development practices. Computer Systems Engineering.

Ref: Text Book 1: Chapter: 1

Module No. 2 (Software Life Cycle models:) 5 Hours

A few basic concepts, Waterfall model and its extensions, Rapid Application Development, Agile development models, Spiral Model, A Comparison of different Life Cycle models, Case Studies.

Ref: Text Book 1: Chapter: 2

CSE3122 - Software Engineering (Course Syllabus)

Module No. 3 (Requirement Analysis and Specification:) 3 Hours

Requirement Gathering and Analysis, Software Requirement Specifications, Case Studies Formal Specification Techniques, Case Studies.

Ref: Text Book 1: Chapter: 4

Module No. 4 (Software Design:) 3 Hours

Overview of the design Process, How to characterize a good software design? Cohesion and coupling, Layered arrangement of modules, Approaches to software design.

Ref: Text Book 1: Chapter: 5

CSE3122 - Software Engineering (Course Syllabus)

Module No. 5 (Function-Oriented Software Design:) 3 Hours

Overview of SA/SD methodology, Structured analysis, Developing the DFD Model of a system, Case Studies Structured Design, Case Studies Detailed design, Design review, Case Studies.

Ref: Text Book 1: Chapter: 6

Module No. 6 (Object modelling using UML:) 3 Hours

Basic object-orientation concepts, UML, UML diagrams, Use case model, Class diagrams, Interaction diagrams, Activity Diagram, State chart diagram, Case Studies Postscript, Design Patterns, An Object-Oriented Analysis and Design (OOAD) Methodology, Case Studies.

Ref: Text Book 1: Chapter: 7, Chapter: 8.1 - 8.3

CSE3122 - Software Engineering (Course Syllabus)

Module No. 7 (Coding and Testing:) 3 Hours

Coding, Code review, Software Documentation, Testing, Unit Testing, Black-Box testing, White-Box Testing, Debugging, Program Analysis tools, Regression testing, Security testing, Robustness testing, Fuzzy testing, Integration testing, Testing OOP, System testing, Some general issues associated with testing.

Ref: Text Book 1: Chapter: 10, Ref 4: Ch: 8.2, Ch: 15.3, Ref 6: Ch: 3.1, Ch: 4.3, Ch: 4.4, Ref 7

Evaluation Process

- **IA Marks : 50**

  Assignment: 20

  Mid Term Exam: 30 (12th - 18th Sept. 2025)

- **End Semester Exam Marks : 50**