



**Computer Science Paper-II  
Software Engineering  
[CORE COURSE]**

Semester III	Credits: 2	Subject Code: BS32102	Lectures: 48
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**Course Outcomes:**

**At the end of this course, the learner will be able to:**

- Explain basic SW engineering methods and practices, and their appropriate application
- Illustrate data models, object models, context models and behavioral models.
- Compare and chose a process model for a software project development.
- Decide the Software Requirement Specification, Design document, Project plan of a given software system.

<b>Unit 1: Introduction to Software Engineering and Process Models</b>	<b>8</b>
<ul style="list-style-type: none"><li>• Definition of Software</li><li>• Nature of Software Engineering</li><li>• Changing nature of software</li><li>• Software Process<ul style="list-style-type: none"><li>◦ The Process Framework</li><li>◦ Umbrella Activities</li><li>◦ Process Adaptation</li></ul></li><li>• Generic Process Model</li><li>• Prescriptive Process Models<ul style="list-style-type: none"><li>◦ The Waterfall Model</li><li>◦ Incremental Process Models</li><li>◦ Evolutionary Process Models</li><li>◦ Concurrent Models</li><li>◦ The Unified Process</li></ul></li></ul>	

<b>Unit 2: Agile Development</b>	<b>5</b>
<ul style="list-style-type: none"><li>• What is Agility?</li><li>• Agile Process<ul style="list-style-type: none"><li>◦ Agile Principles</li><li>◦ The Politics of Agile Development</li><li>◦ Human Factors</li></ul></li><li>• Extreme Programming (XP)<ul style="list-style-type: none"><li>◦ XP Values, XP Process, Industrial XP</li></ul></li><li>• Adaptive Software Development (ASD)</li><li>• Scrum</li><li>• Dynamic System Development Model (DSDM)</li><li>• Agile Unified Process (AUP)</li></ul>	

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● Case study on Agile Project	
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<b>Unit 3: Requirements Analysis and Requirements Modeling</b>	<b>7</b>
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- Requirement Elicitation
- Software requirement specification (SRS)
- Developing Use Cases (UML)
- Building the Analysis Model
- Elements of the Analysis Model
- Analysis Patterns
- Agile Requirements Engineering
- Negotiating Requirements
- Validating Requirements

<b>Unit 4: Requirements Modeling</b>	<b>10</b>
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- Introduction to UML
- Structural Modeling
  - Use case model
  - Class model
- Behavioral Modeling
  - Behavioral Modeling
  - Activity model
  - Communication or Collaboration model
- Architectural Modeling
  - Component model
  - Artifact model
  - Deployment model

<b>Unit 5: Design Concepts</b>	<b>6</b>
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- Design Process
  - Software Quality Guidelines and Attributes
  - Evolution of Software Design
- Design Concepts
  - Abstraction
  - Architecture
  - Patterns
  - Separation of Concerns
  - Modularity
  - Information Hiding
  - Functional Independence
  - Refinement
  - Aspects

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<ul style="list-style-type: none"><li>○ Refactoring</li><li>○ Object Oriented Design Concepts</li><li>○ Design Classes</li><li>○ DependencyInversion</li><li>○ Design forTest</li><li>● The DesignModel<ul style="list-style-type: none"><li>○ Data Design Elements</li><li>○ Architectural Design Elements</li><li>○ Interface Design Elements</li><li>○ Component-Level Diagram</li><li>○ Deployment-Level Diagram</li></ul></li></ul>	
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\*Contact hours=12

**Recommended Books:**

<ul style="list-style-type: none"><li>● Jalote, P. (2008). <i>A Concise Introduction to Software Engineering</i>. Springer. ISBN: 978-1-84800-301-9</li><li>● Pressman, R. S. (1987). <i>Software engineering: A practitioner's approach</i>. (6th ed.). New York: McGraw-Hill. ISBN-13: 978-0-07-802212-8, ISBN-10: 0-07-802212-6</li><li>● Rumbaugh, J., Jacobson, I., Booch, G. (2004). <i>The Unified Modeling Language Reference Manual</i> (2<sup>nd</sup> ed.). Addison-Wesley. ISBN 0-201-30998-X</li></ul>
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(S.Y.B.SC.(C.S.) 2021-2024

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Faculty	Ms. Shubhangi Jagtap	Shubhangi 06/03/21
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