

**UNIT I**

**Chapter 1 : Software Engineering Fundamentals 1-1 to 1-8**

**Software Engineering Fundamentals :** Introduction to software engineering, The Nature of Software, Defining Software, Software Engineering Practice.

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**Chapter 2 : Software Process 2-1 to 2-34**

**Software Process :** A Generic Process Model, defining a Framework Activity, Identifying a Task Set, Process Patterns, Process Assessment and Improvement, Prescriptive Process Models, The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Concurrent Models, A Final Word on Evolutionary Processes. Unified Process, Agile software development : Agile methods, plan driven and agile development. Case studies - Agile Tools – JIRA.

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**UNIT II**

**Chapter 3 : Modeling**

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**Modeling** : Requirements Engineering, Establishing the Groundwork, Identifying Stakeholders, Recognizing Multiple Viewpoints, working toward Collaboration, Asking the First Questions, Eliciting Requirements, Collaborative Requirements Gathering, Usage Scenarios, Elicitation Work Products, Developing Use Cases, Building the Requirements Model, Elements of the Requirements Model, Negotiating Requirements, Validating Requirements. **Suggested Free Open Source Tools** : StarUML, Modelio, SmartDraw.

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**UNIT III**

**Chapter 4 : Estimation For Software Projects 4-1 to 4-17**

**Estimation for Software Projects :** The Project Planning Process, Defining Software Scope and Checking Feasibility, Resources management, Reusable Software Resources, Environmental Resources, Software Project Estimation, Decomposition Techniques, Software Sizing, Problem-Based Estimation, LOC-Based Estimation, FP-Based Estimation, Object Point (OP) -based estimation, Process-Based Estimation, Estimation with Use Cases, Use-Case-Based Estimation, Reconciling Estimates, Empirical Estimation Models, The Structure of Estimation Models, The COCOMO II Mode, Preparing Requirement Traceability Matrix.

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**UNIT IV**

**Chapter 6 : Design Engineering** **6-1 to 6-16**

Design Concepts : Design within the Context of Software Engineering, The Design Process, Software Quality Guidelines and Attributes, Design Concepts - Abstraction, Architecture, design Patterns, Separation of Concerns, Modularity, Information Hiding, Functional Independence, Refinement, Aspects, Refactoring, Object-Oriented Design Concept, Design Classes, The Design Model , Data Design Elements, Architectural Design Elements, Interface Design Elements, Component-Level Design Elements, Component Level Design for Web Apps, Content Design at the Component Level, Functional Design at the Component Level, Deployment-Level Design Elements.

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**Architectural Design** : Software Architecture, What is Architecture, Why is Architecture Important, Architectural Styles, A brief Taxonomy of Architectural Styles. **Suggested Free Open Source Tool** : Smart Draw

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**Chapter 9 : Software Configuration Management** **9-1 to 9-20**

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**UNIT VI**

**Chapter 10 : Software Testing** **6-1 to 6-18**

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**Suggested Free Open Source Tools :** Selenium, JUnit.

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