

DSE 02b Software Engineering

S.No.	Topic Covered	Contents	Reference	No. of Lectures
1	Unit 1: Introduction: Software Process, Software Characteristics, Changing nature of Software, Role of Management in Software Development; Software Life Cycle Models- Waterfall Model, Incremental Process Model, Prototyping Model, and Spiral Model Introduction to Agile development.	Ch 1: 1.2, 1.3, 1.6, Ch 2: 2.2-2.4 Ch 5: 5.5.1	[1] [2]	9
2	Unit 2: Requirement Engineering: Crucial Process steps, Types of Requirements, Requirement Elicitation, Requirement Analysis, Requirement Documentation, Requirement Validation.	Ch 3: 3.1.1, 3.2, 3.4.5, 3.5 - 3.5.2, 3.6.3* 3.7 (till Page 92)	[1]	6
3	Unit 3: Software Project Planning: Size Estimation – Lines of code, Function points; Cost estimation using Constructive Cost Model (COCOMO model), Software Risk Management, Project Scheduling (Gantt Chart).	Ch 4: 4.1, 4.4-4.4.1, 4.7-4.7.3 Ch 34: 34.5.1	[1] [2]	7
4	Unit 4: Software Design: Conceptual and Technical Design, Objectives of Design, Module Coupling and Cohesion, Strategy of Design, Function-oriented Design	Ch 5: 5.1-5.1.2, 5.2-5.2.2, 5.3, 5.4	[1]	8
5	Unit 5: Software Quality: Quality Attributes, McCall Software Quality Model, Capability Maturity Model (CMM), Software Reliability.	Ch 7: 7.1- 7.1.1, 7.2-7.2.1, 7.4-7.4.1	[1]	5
6	Unit 6 : Software Testing: Error, Fault and Failure, Functional Testing- Boundary Value Analysis, Equivalence Class Testing; Structural Testing- Path Testing, Cyclomatic Complexity; Levels of Testing, Validation Testing.	Ch 8: 8.1-8.1.1, 8.2-8.2.4, 8.3-8.3.2, 8.4- 8.4.2, 8.5, 8.6	[1]	10
			Total	45

* To be covered in Practical only

References

1. Aggarwal, K. K., & Singh, Y. (2007). *Software Engineering*. 3rd edition. New Age International Publishers.
2. Pressman, R. S., & Maxim, B. R. (2015). *Software Engineering: A Practitioner's Approach*. 8th edition. McGraw-Hill.

Additional References

1. Ken Schwaber, Jeff Sutherland, The Definitive Guide to Scrum: The Rules of the Game, July 2016. [<https://www.scrumguides.org/docs/scrumguide/v1/scrum-guide-us.pdf>]
2. I Sommerville, Software Engineering, 9th edition, Addison Wesley, 2011.
3. P Jalote, An Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House, 2005.

Suggestive Practice Questions:

Create a project report that includes the following –

1. Define Problem Statement for the project and identify process model.
2. Requirement Elicitation, Requirement Analysis: Data Modelling, Software Requirement Specification Document.
3. Project Management: Compute Function Point, Effort, Cost, Risk Identification, Gantt Chart.
4. Software Design: Structured Chart, Pseudocode of a small module.
5. Coding: Develop at least a single module using any programming Language.
6. Testing: Compute Cyclomatic Complexity for the coded module, and generate test cases.

Some of the Sample Projects are given below though they are not limited to this.

1. College Canteen Automation System
2. Online Car-Pooling System
3. Patient Appointment System
4. Medical Prescription Processing System
5. Online Shopping Management System
6. Online Hotel Reservation Service System
7. Online Movie Booking System
8. Online Examination and Result computation System
9. Automatic Internal Assessment System
10. Complaint Ticket Management System