CS-10: Software Engineering

Introduction: 08 L

The Evolving Role of Software, Software Characteristics, Changing Nature of Software, Software Engineering as a Layered Technology, Software Process Framework, Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration (CMMI)

[1] : [1.1, 1.3, 1.4, up to 2.1.2, 2.3 – up to 2.3.3, 3.1 – 3.3 (before 3.3.1), 30.3]

Requirement Analysis: 6 L

Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modeling Techniques.

[2]: [3.1.2 (pg: 72-75), 3.2 up to 3.2.2 (pg: 75-87), 3.3 up to 3.3.2]

Design Engineering: 5 L

Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture.

[2]: [up to 6.2**],**

[1]: [9.1.1, 9.6 up to 9.6.1]**.**

Quality Management: 3 L

Quality Concepts, Software Quality Assurance, Software Reviews, Metrics for Process and Projects.

[1]: [14.4, up to 15.2, up to 16.2]

Software Metrics: 8 L

Product Metrics, Measures, Metrics and Indicators, Function Based Metrics, Process and Project Metrics, Software Measurements, and Metrics for software quality

[1]: [up to 23.1.1, 23.2- up to 23.2.1, up to 25.2.3, 25.3]

Estimations and Scheduling: 07 L

Estimations for Software Projects, Empirical Estimation Models, Project Scheduling.

[1]: [26.5, 26.6- up to 26.6.6, 26.7.2, 26.7.3, 27.5- up to 27.5.1]

Testing Strategies & Tactics: 07 L

Software Testing Fundamentals, Strategic Approach to Software Testing, Test Strategies for Conventional Software, Black-Box Testing, White-Box Testing, Basis Path Testing.

[1]: [up to 17.1.3, 17.3, 17.6, 17.7, 18.2-18.4, 18.6 up to 18.6.3(exclude 18.6.1)]

Risk Management: 4 L

Software Risks, Risk Identification, Risk Projection and Risk Refinement, Risk Mitigation, Monitoring and Management.

[1]: [up to 28.6]

Recommended Reading Material

Text Books

1. R.S. Pressman, Software Engineering: A Practitioner's Approach, McGraw-Hill, Ed 7, 2010.
2. P. Jalote, An Integrated Approach to Software Engineering, Narosa Publishing House, Edition 3, 2011.

Reference Books:

3. R. Mall, Fundamentals of Software Engineering, Prentice-Hall of India, 3rd Edition, 2009.
4. I. Sommerville, Software Engineering (9th edition), Addison Wesley, 2010

LIST OF PRACTICALS OF CS-10: SOFTWARE ENGINEERING

S. No.	Practical Title
1.	• Problem Statement, • Process Model

2.	Requirement Analysis: • Creating a Data Flow • Data Dictionary, Use Cases
3.	Project Management: • Computing FP • Effort • Schedule, Risk Table, Timeline chart
4.	Design Engineering: • Architectural Design • Data Design, Component Level Design
5.	Testing: • Basis Path Testing

Sample Projects:

1. **Criminal Record Management** : Implement a criminal record management system for jailers, police officers and CBI officers
2. **DTC Route Information**: Online information about the bus routes and their frequency and fares
3. **Car Pooling**: To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System