UNIT I

Syllabus : Software Engineering Fundamentals : Nature of Software, Software Engineering Principles, The Software Process, Software Myths. Process Models : A Generic Process Model, Prescriptive Process Models : The Waterfall, Incremental Process (RAD), Evolutionary Process, Unified Process, Concurrent. Advanced Process Models and Tools : Agile software development : Agile methods, Plan-driven and agile development, Extreme programming Practices, Testing in XP, Pair programming, Introduction to agile tools : JIRA, Kanban, Case Studies : An information system (mental health-care system), wilderness weather system.

UNIT II

Syllabus : Requirements Engineering : User and system requirements, Functional and non-functional requirements, Types and Metrics, A spiral view of the requirements engineering process. Software Requirements Specification (SRS) : The software requirements Specification document, The structure of SRS, Ways of writing a SRS, structured and tabular SRS for an insulin pump case study, Requirements elicitation and Analysis : Process, Requirements validation, Requirements management. Case Studies : The information system. Case study - Mental health care patient management system (MHC-PMS).

Chapter 4 : Requirement Engineering **4-1 to 4-18**

4 types of requirements

UNIT III

Syllabus : Design Process and quality, Design Concepts, The design Model, Pattern-based Software Design. Architectural Design : Design Decisions, Views, Patterns, Application Architectures, Modeling Component level

Design : Component, Designing class based components, conducting component-level design, User Interface Design : The golden rules, Interface Design steps and Analysis, Design Evaluation, Case Study : Web App Interface Design.

UI design issues

UNIT IV

Syllabus : Project Management Concepts : The Management Spectrum, People, Product, Process, Project, The W5HH Principle, Metrics in the Process and Project Domains, Software Measurement : size and function oriented metrics (FP and LOC), Metrics for Project and Software Quality, Project Estimation : Observations on Estimation, Project Planning Process, Software Scope and feasibility, Resources : Human Resources, Reusable software, Environmental Resources. Software Project Estimation, Decomposition Techniques, Empirical Estimation Models : Structure, COCOMO II, Estimation of Object-oriented Projects, Specialized Estimation

Case Study : Software Tools for Estimation, Project Scheduling : Basic Concepts, Defining a Task Set for the Software Project, Defining Task Network, Scheduling with time-line charts, Schedule tracking Tools : Microsoft Project, Daily Activity Reporting and Tracking (DART).

Project decomposition, work to

UNIT V

Syllabus : Project Risk Management : Risk Analysis and Management : Reactive versus Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation, Risks Monitoring and Management, The RMMM plan for case study project.

Software Configuration Management : The SCM repository, SCM process, Configuration management for WebApps, Case study : CVS and Subversion Tools, Visual Source Safe from Microsoft and Clear Case. Maintenance and Reengineering : Software Maintenance, Software Supportability, Reengineering, Business Process Reengineering, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering.

Categories of Risks

UNIT VI

Syllabus : Introduction to Software Testing, Principles of Testing, Testing Life Cycle, Phases of Testing, Types of Testing, Verification and Validation, Defect Management, Defect Life Cycle, Bug Reporting, GUI Testing, Test Management and Automation.

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Test Management & Automation