

COURSE CONTENTS

Unit 1

Introduction: Introduction to software engineering, Importance of software, The Software evolution, Software characteristics, Software components, Software applications, Crisis-Problem and causes. Difference between software engineering and system engineering

Software Process Models: Waterfall model, Evolutionary Models, prototyping, V Model, Spiral model Incremental Model, RAD Model etc.

Introduction to Agile models like Scrum, Extreme Programming, Feature Driven Development, Crystal etc., Comparison between Traditional and Agile models

Requirement Engineering: Different Types of Requirements: Functional, Non Functional and Domain Requirements in detail, Requirement elicitation Techniques like interviews, questionnaire, brainstorming, JAD, Scenario, Mind mapping, Requirement workshop, Prototyping, CRC Cards etc. Requirements Management, Writing SRS as per IEEE standard, Quality characteristics of SRS

Unit 2

Requirements Specification: Difference between structured and Object Oriented Analysis, Different views of modeling, ER diagram, Data flow diagrams, State Transition Diagrams, data Dictionary, techniques for

describing process specifications, Introduction to Unified Modelling Language(UML), Introduction to Use Case Diagrams in detail

Unit 3

System Design: Types of Coupling and Cohesion, Deriving structure chart from DFD in case of structured analysis.

Software Architecture: Importance of Software architecture, Different views of Software Architecture, Popular Architecture Styles

Software project Management: Project Management Process, System Request, Feasibility Analysis in detail Cost estimation Models like COCOMO, Function Point Analysis, Putnam estimation model etc., Project scheduling, Finding Critical Path, staffing, Introduction to software configuration management

Unit 4

Software Testing: Difference between verification and validation testing, Introduction to verification and Validation testing techniques, Levels of testing, , Alpha and Beta testing, System testing.

Unit 5

Software Quality : Software Quality Models like McCall's Quality model, Quality frameworks like Capability Maturity Model, ISO9001, Software quality metrics, Software Reliability

Software Maintenance : Different Types of maintenance

Risk management.

Current trends and future directions for Software Engineering

Practical:

1. Choose a problem domain and textually write the Functional and Non Functional requirements of the domain. While writing make use of elicitation techniques discussed in the class
2. For a Problem domain develop a Mind-Map
3. Draw the static View of the Problem domain of exercise 1 using ER diagram
4. Draw the functional view of the problem domain of exercise 1 using Data Flow Diagram
5. Write down the data dictionary and process specifications of the processes of DFD using different techniques discussed in the class
6. Draw the Dynamic view of working of an ATM Machine or Microwave Oven
7. Generate SRS as per IEEE std-830 using structured analysis techniques for the problem domain you have described in exercise 1
8. Develop the Structure chart from the DFD developed in exercise 4.
9. Develop a Use Case Model(use Case diagram and Use case Narratives) for a problem domain
10. Perform Effort estimation activity and Implement Critical path method using an open source Tool for a case study.
11. Study of tools for Configuration management and Cost estimation models