

**Course Title: Software Engineering**

**Course no: CSC-351**

**Credit hours: 3**

**Full Marks: 70+10+20**

**Pass Marks: 28+4+8**

**Nature of course:** Theory (3 Hrs.) + Lab (3 Hrs.)

**Course Synopsis:** Discussion on types of software, developing process and maintaining the software.

**Goal:** This course introduces concept of software development paradigm and implementing these in real world.

**Course Contents:**

**Unit 1: 11 Hrs.**

- 1.1 Introduction to Software Engineering: Definition of software, software engineering. Comparing between other engineering and software engineering.
- 1.2 System Engineering: Introduction to System, System properties, system and their environment, system modeling.
- 1.3 Software Process: Introduction, software process model, process iteration, software specification, software design and implementation, software validation, software evolution.
- 1.4 Project Management: Introduction, management activities, project planning, project scheduling, risk management.

**Unit 2: 12 Hrs.**

- 2.1 Software Requirements: Introduction, Types of requirements, requirements engineering process: Feasibility study, requirements elicitation and analysis, requirement validation, requirement management.
- 2.2 Software Prototyping: Introduction, prototyping in the software process, rapid prototyping techniques, user interface prototyping.
- 2.3 Formal Specification: Introduction, formal specification in software process, interface specification, behavioral specification.

**Unit 3: 6 Hrs.**

- 3.1 Architectural Design: Introduction, system structuring, control models, modular decomposition, domain specific architecture.
- 3.2 Object Oriented Design: Introduction, Features of object oriented design, object oriented software engineering.

**Unit 4:****16 Hrs.**

- 4.1 Verification & Validation: Introduction, verification and validation planning, software inspection, cleanroom software development.
- 4.2 Software Testing: Introduction, types of testing, testing work benches.
- 4.3 Critical system validation: Introduction, formal methods and critical systems, reliability validation, safety assurance, security assessment.
- 4.4 Software Cost Estimation: Introduction, productivity, estimation techniques.
- 4.5 Software Reengineering: Introduction, source code translation, reverse engineering.

**Laboratory works:** Developing the software techniques explained in the course.

**Homework**

**Text Books:** Software Engineering, 7<sup>th</sup> Edition, Ian Sommerville, PEARSON EDUCATION ASIA

**Reference:** Software Engineering: A Practitioner's Approach, 6<sup>th</sup> Edition, Roger S. Pressman, McGraw Hill International Edition.

**Assignment:** Assignment should be given from the above units in throughout the semester.

**Computer Usage:** No specific

**Prerequisite:** C, C++, Data Structure, Automata Theory, System Analysis & Design

**Category Content:** Science Aspect: 60%  
Design Aspect: 40%