# SOFTWARE ENGINEERING
## (Common to CSE & IT)

**Course Code : 15CT1114**

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**Pre-requisites:**

Introduction to computing

**Course Outcomes:**

At the end of the Course, the Student will be able to:

**CO 1** Explain software process models.

**CO 2** Differentiate functional and non–functional requirements.

**CO 3** Discuss system models.

**CO 4** Explain testing strategies.

**CO 5** Discuss Risk Management and Quality Management Techniques.

**UNIT-I** **(10 Lectures)**

**INTRODUCTION TO SOFTWARE ENGINEERING:**

Software, The Nature of Software, Software Engineering, The Software Process, Software Engineering practice, Software Myths, A Generic Process Model, Process Assessment and Improvement, Product and Process, CMMI. (Text Book-1)

**PROCESS MODELS:**

Prescriptive Process Models- The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Concurrent Models. Specialized Process Models.The Unified Process, Personal and Team Process Models.Agile Development. (Text Book-1)

**UNIT-II** **(10 Lectures)**

**SOFTWARE REQUIREMENTS:**

Functional and Nonfunctional Requirements, User Requirements, Interface Specification, the software requirements document.

**REQUIREMENTS ENGINEERING PROCESS:**

Feasibility Studies, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management.ATM Case study-Functional and Nonfunctional Requirements,User Requirements, SRS document. (Text Book-2)

## UNIT-III (10 Lectures)

**DESIGN ENGINEERING:**

The Design Process, Design Concepts, the Design Model.

**ARCHITECTURAL DESIGN:**

Software Architecture, Architectural Genres, Architectural Styles, Architectural Design, Architectural Mapping using Data Flow. (Text Book-1)

**SYSTEM MODELS:**

Context Models, Behavioral Models, Data Models, Object Models, Structured Methods.ATM Case study-system models

**OBJECT ORIENTED DESIGN:**

Objects and Object Classes, an Object Oriented Design Process, Design Evolution. (Text Book-2)

## UNIT-IV (12 Lectures)

**USER-INTERFACE DESIGN:**

The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.ATM Case study-Design user interface

**SOFTWARE TESTING STRATEGIES:**

A Strategic Approach to Software Testing, Test Strategies for Conventional Software and Object Oriented Software, Validation Testing, White- Box Testing, Basis Path Testing, Black-Box Testing, System Testing. (Text Book1)

**PRODUCT METRICS:**

A Framework for Product Metrics, Metrics for Requirements Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.

### PROCESS AND PROJECT METRICS:

Software Measurement, Metrics for Software Quality.
(Text Book-1)

## UNIT-V (8 Lectures)

### RISK MANAGEMENT:

Reactive versus Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, RMMM, RMMM Plan.

### QUALITY MANAGEMENT:

Software Quality, Informal Reviews, Formal Technical Reviews, Statistical Software Quality Assurance, Software Reliability, the ISO 9000 Quality Standards. (Text Book-1)

## TEXT BOOKS:

1. Roger S. Pressman, "Software Engineering a Practitioner's Approach", 7thEdition, TMH, 2010.
2. Sommerville, "Software Engineering", 9thEdition, Pearson Education, 2011.

## REFERENCES:

1. K.K.Agarwal&Yogesh Singh, "Software Engineering", 3rdEdition, New Age International Publishers, 2008.
2. ShelyCashman Rosenblatt, "System Analysis and Design", 2ndEdition, Thomson Publications, 2011.
3. PankajJalote, "An Integrated Approach to Software Engineering", 3rdEdition, NarosaPublishing House, 2011.

## WEB REFERENCE:

http://nptel.iitm.ac.in/courses/106101061/