

**3/4 B.Tech FIRST SEMESTER**

**IT5T4**

**SOFTWARE ENGINEERING**

**Credits: 4**

**Lecture: 4 periods/week**

**Internal assessment: 30 marks**

**Tutorial: 1 period /week**

**Semester end examination: 70 marks**

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**Objectives**

To give an idea about

- Basics of software and software engineering principles
- Role of a process and a various process models in project development.
- How to prepare requirements document and its validation
- Different styles used to design the architecture of a proposed system.
- Overall testing process by using different approaches
- Different process and product metrics also the various quality assurance techniques
- Various risks during the development activities and the mitigation activities

**Outcomes**

Students will be able to

- Apply Software Engineering Techniques and Process models for software development
- Document and evaluate the milestones at every phase development process.
- Analyze the risk happening and its management.
- Know the different quality standards to be followed for development process.
- Know how to test the software at different levels by preparing a proper test plans.

**Syllabus**

**UNIT I**

**SOFTWARE AND SOFTWARE ENGINEERING:**

The Nature of Software, the Unique Nature of WebApps, Software Engineering, the Software Process, Software Engineering Practice, Software Myths.

**PRINCIPLES THAT GUIDE PRACTICE:**

Software Engineering Knowledge, Core principles.

**UNIT II**

**PROCESS MODELS:**

Generic process model, Prescriptive process models, Specialized Process Models, Unified Process, Personal and Team Process Models.

**AGILE DEVELOPMENT:**

What Is Agility, Agility and Cost Of Change, Extreme Programming.

### **UNIT III**

#### **UNDERSTANDING REQUIREMENTS:**

Requirements Engineering, Eliciting Requirements, Developing Use cases.

#### **MODELING REQUIREMENTS:**

Requirements Analysis, Scenario based Modeling, Class based Modeling.

### **UNIT IV**

**DESIGN CONCEPTS:** Design process, Design concepts, The design model.

**ARCHITECTURAL DESIGN:** Architectural styles, Architectural design.

### **UNIT V**

**COMPONENT LEVEL DESIGN:** Designing class based components.

**USER INTERFACE DESIGN:** Golden rules, User interface analysis and design, interface analysis.

**PATTERN-BASED DESIGN:** Design patterns, Architectural Patterns, Component level design patterns, user interface design patterns.

### **UNIT VI**

**SOFTWARE TESTING STRATEGIES:** A Strategic Approach to Software Testing, Test Strategies for Conventional Software, Test Strategies for object-oriented Software, Validation Testing, System Testing, The Art of Debugging.

#### **TESTING CONVENTIONAL APPLICATIONS:**

White box testing, Black-box testing.

### **Unit-VII**

**Product Metrics:** A Framework for Product metrics, Metrics for Requirements Model, Metrics for Design Model, Metrics for Testing, Metrics for Maintenance.

**Process and Project Metrics:** Metrics in Process and Project Domains, Software Measurement, Metrics for Software Quality.

### **UNIT VIII**

**Risk Management:** Reactive vs. Proactive Risk strategies, Software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

**Quality Management:** What is quality, Software Quality.

**Software Quality Assurance:** Elements of Software quality assurance, SQA Tasks, goals and metrics, The ISO 9000 quality standard, SQA Plan.

#### **Text Book:**

1. Software Engineering, 7/e , Roger S.Pressman , TMH

#### **Reference Books:**

1. Software Engineering, A Precise approach, Pankaj Jalote, Wiley.
2. Software Engineering principles and practice, W S Jawadkar, TMH.
3. Software Engineering concepts, R Fairley, TMH.