

CLASS: B. Sc (Information technology)		Semester – IV	
COURSE: Software Engineering			
Periods per week 1 Period is 50 minutes	Lecture	5	
	TW/Tutorial/Practical	3	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	TW/Tutorial/Practical	--	50

Unit-I	An Introduction : To Software, Software Engineering, Software Process, Software Engineering Methods; CASE Tools, Attributes of good software. Socio-technical system : Essential characteristics of socio technical systems, Emergent System Properties, Systems Engineering, Components of system such as organization, people and computers, Dealing Legacy Systems. Critical system : Types of critical system, A simple safety critical system, Dependability of a system, Availability and Reliability, Safety and Security of Software systems
Unit-II	Software processes : Fundamental activities of software process, Different software process models, Process Iteration and Activities, The Rational Unified Process, CASE in detail. Project Management : Software Project Management, Management activities, Project Planning, Project Scheduling, Risk Management. Software Requirements : Functional and Non-functional requirements, User Requirements, System Requirements, Interface Specification, Documentation of the software requirements
Unit-III	Requirements Engineering Processes : Feasibility study, Requirements elicitation and analysis, Requirements Validations, Requirements Management. System Models : Models and its types, Context Models, Behavioural Models, Data Models, Object Models, Structured Methods. Architectural Design : Architectural Design Decisions, System Organisation, Modular Decomposition Styles, Control Styles, Reference Architectures
Unit-IV	Application Architectures : Data Processing Systems, Transaction Processing Systems, Event Processing Systems, Language Processing Systems Object Oriented Design : Objects and Object Classes, An object Oriented Design

	<p>Process, Design Evolution</p> <p>User Interface Design : Need of UI design, Design issues, The UI design Process, User analysis, User Interface Prototyping, Interface Evaluation</p> <p>Rapid Software Development : Agile Methods, Extreme Programming, Rapid Application Development, Software Prototyping</p>
Unit-V	<p>Component based Software Engineering : Components and Component models, The CBSE Process, Component Composition. Verification and Validation : Planning Verification and Validation, Software Inspections, Automated Static Analysis, Verification and Formal Methods. Software Testing : System Testing, Component Testing, Test Case Design, Test Automation. Software Cost Estimation : Software Productivity, Estimation Techniques, Algorithmic Cost Modeling, Project Duration and Staffing</p>
Unit-VI	<p>Quality Management : Process and Product Quality, Quality assurance and Standards, Quality Planning, Quality Control, Software Measurement and Metrics</p> <p>Process Improvement : Process and product quality, Process Classification, Process Measurement, Process Analysis and Modeling, Process Change, The CMMI Process Improvement Framework. Security Engineering : Security Concepts, Security Risk Management, Design for Security, System Survivability. Service Oriented Software Engineering : Services as reusable components, Service Engineering, Software Development with Services</p>

Books:

Software Engineering, "Ian Somerville", 8th edition, Pearson Education.

Software Engineering, Pankaj Jalote, Narosa Publication

Reference:

Software Design, "D.Budgen", 2nd edition, Pearson education.

Software engineering, A practitioner's approach, Roger Pressman, Tata McGraw-Hill

Software Engineering by KL James, PHI(2009) EEE edition

Software Engineering principles and practice by WS Jawadekar Tata McGraw-Hill

Term Work:

Assignments: Should contain at least 6 assignments (one per unit) covering the

Syllabus.

Tutorial: At least three tutorials based on above syllabus must be conducted.

Case Studies (Suggested)

1. Project Initiation and scheduling.
2. Analyzing a system and specifying the requirements
 - a. Structured Approach
 - b. Object oriented Approach
3. Project Cost Estimation
4. Designing the database design
5. Designing the User interface design
6. Use of testing methodologies
7. Cost Estimation Techniques
8. Cost benefit Analysis