SOFTWARE ENGINEERING

Course Code : CS31001

Credit : 4

L-T-P : 3–1-0

Prerequisites : Nil

Course delivery plan:

Serial number	Topics to be covered	Hours required
1.	Introduction Role of Software Engineer, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Quality Attributes.	5
2.	Assessment How Software Engineering Changes? Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models, Choosing a social relevant problem, Summary Team Report.	10
3.	Requirement Engineering Process Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modeling, Data Flow Diagrams, Entity Relationship Diagrams, Designing the architecture.	5
4.	Assessment Impact of Requirement Engineering in their problem, Decision Tables, SRS Document, IEEE Standards for SRS, Architectural design, component level design, User interface design, WebApp Design, Submission of SRS Document for Team Project.	5
5.	Quality concepts, Review Techniques, Software Quality Assurance (SQA) Verification and Validation, SQA Plans, Software Quality Frameworks.	3
6.	Assessment Framing SQA Plan, ISO 9000 Models, SEI-CMM Model and Their relevance to project Management, Other emerging models like People CMM.	2
7.	Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing, Software Testing Strategies, Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Testing conventional applications, Object oriented applications, Web applications, Formal modeling and Verification, Software configuration management, Product metrics. Assessment: Team Analysis in Metrics Calculation.	10

8.	Project Management Concepts, Process and Project Metrics, Estimation for Software projects, Project Scheduling, Risk Management, Maintenance and Re-engineering. Assessment: Preparation of Risk mitigation plan.	5

Learning activities in continuous assessment:

Total hours for learning activities: 20 Hours

Serial number	**Activity to be conducted**	**Mark**	**Tangible output achieved**
1.	**Assignments:** Questions related to above module that requires analysis. One assignment pre-midsem and one post midsem.	10	Hand written or typed assignment
2.	**Quiz: Ques**	5	Google Classroom
3.	**Software Development Project**	8	Report, presentation .
4.	**Class Participation**	7	Class Notes, Class Participation and Performance

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COURSE OBJECTIVE

- To understand the Software Engineering Practice
- To understand the Software Engineering Process Models
- To understand Design Engineering, Web applications
- To gain knowledge of the software testing
- To understand Software Project Management

COURSE OUTCOMES

After successfully completing the course, the students will be able to

CO1: Identify appropriate software process models for developing real life projects
CO2: Assess each module given the overall Software engineering practice
CO3: Enhance the software project management skills

CO4: Comprehend the systematic methodologies involved in SE

CO5: Work ethically in a team as well as independently on software projects and adapt to the ever changing dynamic real world situations.

CO6: Design and develop a software product in accordance with SE principles

COURSE DETAILS

Introduction

Role of Software Engineer, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Quality Attributes.

Assessment

How Software Engineering Changes? Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models, Choosing a social relevant problem, Summary Team Report.

Requirement Engineering Process

Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modeling, Data Flow Diagrams, Entity Relationship Diagrams, Designing the architecture.

Assessment

Impact of Requirement Engineering in their problem, Decision Tables, SRS Document, IEEE Standards for SRS, Architectural design, component level design, User interface design, WebApp Design, Submission of SRS Document for Team Project.

Quality concepts, Review Techniques, Software Quality Assurance (SQA)

Verification and Validation, SQA Plans, Software Quality Frameworks.

Assessment

Framing SQA Plan, ISO 9000 Models, SEI-CMM Model and Their relevance to project Management, Other emerging models like People CMM.

Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing, Software Testing Strategies, Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Testing conventional applications, Object oriented applications, Web applications, Formal modeling and Verification, Software configuration management, Product metrics. Assessment: Team Analysis in Metrics Calculation.

Project Management Concepts, Process and Project Metrics, Estimation for Software projects, Project Scheduling, Risk Management, Maintenance and Re-engineering. Assessment: Preparation of Risk mitigation plan.

Textbooks

1. R. S. Pressman, “Software Engineering: A Practitioners Approach”, Seventh Edition, McGraw Hill, 2010.
2. Rajib Mall, “Fundamentals of Software Engineering”, PHI, Third Edition, 2009.
3. Pankaj Jalote, “Software Project Management in Practice”, Pearson Education, New Delhi, 2002.