Course Code: CSE1005	Course Title: Software Engineering	TPC	3	2	4
Version No.	1.0				
Course Pre-requisites/ Co-requisites	None				
Anti-requisites (if any).	SWE1003				
Objectives:	1. To teach the concepts of software process, product and project 2. To elucidate the knowledge of requirement analysis 3. To provide the knowledge of software design and testing 4. To introduce the project management techniques and asses the risk management				
Expected Outcome:	On completion of the course, students will have the ability to 1. Understand common lifecycle processes including waterfall (linear), incremental approaches (such as Unified process), and agile approaches. 2. Model the structure and behavior a software system the UML class diagrams and state diagrams. 3. Design a solution to a given problem using one or more design patterns. 4. Apply software testing and quality assurance techniques at the module level, and understand these techniques at the system and organization level. 5. Prepare technical documentations and make presentations on various aspects of a software development project.				

Module No. 1	An Overview of Software Engineering	10 Hours

Nature of Software , Software Engineering, Software Process, Software Engineering Practice, **Software Process Models:** Linear , RAD, Incremental , Spiral , Component –based development , Fourth Gen Techniques.

Module No. 2	Requirements Engineering and Design	10 Hours

Requirements: Requirements Engineering, UML Model, Developing Use Cases, Building the Requirements Model, Negotiating Requirements, Validating Requirements.
Design: Design within the Context of Software Engineering, Design Process, Design Concepts, Design Model.

Module No. 3	Software Testing	8 Hours

Strategic Approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Fundamentals, Black box Testing, White box testing.

Module No. 4	Process and Product Metrics	8 Hours

Product Metrics, Metrics for the Requirements Model, Metrics for the Design Model, Architectural Design Metrics, Metrics for Software Quality.

Module No. 5	Managing Software Projects	10 Hours

People, Product, Project, Process(4P), Software Project Estimation, Decomposition Technique, Empirical Estimation Models, Project Scheduling.

Module No. 6	Software Quality and Maintenance	10 Hours

Software Quality: Software Quality Factors, Verification & Validation, Software Quality Assurance, The Capability Maturity Model
Software Maintenance: Software maintenance, Maintenance Process Models, Maintenance Cost, Reengineering, Reengineering activities, Software Reuse.

Text Books	

1. Roger Pressman, "Software Engineering: A Practitioner's Approach", McGraw-Hill, 7th Edition, 2016.

References
1. Ian Sommerville, "Software Engineering", Pearson, 10th Edition, 2017
2. Pankaj Jalote, "A Concise Introduction to Software Engineering", Springer, 1st Edition, 2016.
3. Ugrasen and Suman "Software Engineering, concepts and practices", Cengage Learning, 2017

Lab Exercises

SAMPLE PROJECTS FOR SOFTWARE ENGINEERING LAB

Take any below sample real time problems and do the following experiments for each project:

S.No	Sample Projects
1	College Management System(CMS)
2	Library Maintenance System (LMS)
3	Automated Banking System (ABS)
4	Inventory Management System (IMS)
5	Employee Payroll System (EPS)
6	Hospital Management System (HMS)

Software Requirements:

Programming Language	C++/ Java
IDE	NetBeans 7.2.1 and more/ Eclipse Oxygen
Database	Derby/MySQL
Testing	jUnit , HTTP, Selenium
Other Tools	Draw.io, Jira, Selenium, Qlikview

1. Do the Requirement Analysis and Prepare SRS.
2. Analyze the SRS & find out the risk related to the project
3. Draw Use case, E-R diagrams, DFD structured charts for the project.
4. Design of Test cases based on requirements and design.
5. Develop any one module and Do the testing.
6. Prepare Version control and change control for software configuration items.

Sample Real Time Problems: Digital Signature, Distributed Computing for E-Learning, Document Manager, Drive 2 Destiny, E-Bidding, E-Buy, E-Fashion, E-Gift Shoppe, E-Post Office, E-Pricing, E-Tutor Online Jobs, E2M Conference, Easy Leave.

Mode of Evaluation	
	Continuous Assessment Test-1 20%
	Continuous Assessment Test-2 20%
	Continuous Assessment Test-3 20%
	Cumulative Lab Exercises 20%
	Practical Assessment (Mini Project) 20%
Recommended by the Board of Studies on	06.07.2018
Date of Approval by the Academic Council	2nd Academic Council 21.07.2018