

Course Code	Course Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
TEITC601	Software Engineering	04 Hr/Week	02 Hr/Week	---	04	01	---	05

Course Code	Course Name	Examination Scheme								
		Theory Marks					Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam					
		Test 1	Test 2	Avg. of 2 Tests						
TEITC601	Software Engineering	20	20	20	80	25	---	25	150	

Course Objectives:

This course will study a collection of methods which embody an "engineering" approach to the development of software. It will discuss the nature of software and software projects, software development models, software process maturity, project planning, management, and estimations. Students are required to study and practice methods for analysis, design, testing, and implementation of large, complex software systems. We will inquire into the various perspectives on software quality -- what it means, how to measure it, how to improve it. The major work of the course should be a group project.

Course Outcomes:

1. Meet the Information Technology Program Objectives of identifying and solving engineering problems
2. To understand principles, concepts, methods, and techniques of the software engineering approach to producing quality software for large, complex systems.
3. To function effectively as a member of a team engaged in technical work.
4. To think critically about ethical and social issues in software engineering for different applications

DETAILED SYLLABUS

Sr. No.	Module	Detailed Content	Hours
1	Introduction to Software Engineering	Professional Software Development, Layered Technology, Process framework, CMM, Process Patterns and Assessment	03
2	Process Models	Prescriptive Models : Waterfall Model, Incremental, RAD Models Evolutionary Process Models: Prototyping, Spiral and Concurrent Development Model Specialized Models: Component based, Aspect Oriented development	06
03	Agile Software Development	Agile Process and Process Models, Adaptive and Dynamic system Development, Scrum, Feature Driven Development and Agile Modeling	03
04	Engineering and Modeling Practices	Core Principles, Communication, Planning, Modeling, Construction and deployment. System Modeling and UML	04
05	Requirements Engineering and Analysis Model	Requirements Engineering Tasks, Elicitation, building analysis model, Data Modeling concepts, Object Oriented Analysis	06
06	Design Engineering	Design Concepts, Design Model – Data, Architecture, Interface, Component Level and Deployment Level design elements	05
07	Testing strategies and tactics	Testing strategies for conventional and Object Oriented architectures, Validation and system testing Software testing fundamentals, Black box and white box testing, Object Oriented testing methods	06
08	Metrics for Process and Projects	Process Metrics and Project Metrics, Software Measurement, Object Oriented Metrics, Software Project Estimation, Decomposition Techniques, LOC based, FP based and Use case based estimations, Empirical estimation Models	06

09	Risk Management	Risk strategies, Software risks, Risk Identification, Projection, RMMM	03
10	Quality Management	Quality Concepts, SQA activities, Software reviews, FTR, Software reliability and measures, SQA plan	03
11	Change Management	Software Configuration Management, elements of SCM, SCM Process, Change Control	03

Text Books:

1. “Software Engineering : APractitioner’s Approach” by Roger Pressman Sixth Edition
2. “Software Engineering” by Ian Sommerville, Pearson
3. “Software Engineering : A Precise Approach” Pankaj Jalote , Wiley India

References: (for Practical)

1. “System Analysis and Design” Alan Dennis, Wixom, R M Roth – Wiley India
2. “Software Engineering : Principles and Practice” by Waman S Jawadekar

Term work: Should be based on the Project work done as a team.

Suggested Practical List:

The focus of the lab component of this course is to apply software engineering methods for carrying out a software development mini project. Students will be assigned to teams of 3-4 students. Each team will be assigned to produce a software development model, complete with specifications, prototyping, and design.

The deliverables required may be:

1. Application of agility principles/process model selection/system modeling tools for the given scenario
2. Requirements gathering, elicitation, elaboration, negotiation, specification, validation using appropriate tools
3. Use case development
4. Activity diagram, class diagrams, swimlane, data flow diagrams, State diagrams and sequence diagrams
5. Data design model, Architecture, UI, Collaboration diagrams
6. Component Level Design
7. Design unique test cases on different strategies
8. Prepare project Plan, predict resources and timeline(scheduling)
9. Prepare a risk identification and management plan

Theory Examination:

1. Question paper will comprise of 6 questions, each carrying 20 marks.
2. Total 4 questions need to be solved.
3. Q.1 will be compulsory, based on entire syllabus wherein sub questions of 2 to 3 marks will be asked.
4. Remaining question will be randomly selected from all the modules.
5. Weightage of marks should be proportional to number of hours assigned to each module.