

SIDDAGANGA INSTITUTE OF TECHNOLOGY, TUMAKURU

LECTURE PLAN FOR THE ODD SEMESTER ACADEMIC YEAR 2025 – 2026

Teacher	Dr. Nagaratna B. Chittaragi	Dept.	Information Science and Engineering
Class	5th Semester (ISE)- E Section	Course	Software Engineering and Project Management (HSIS01)

Course Learning Objectives (CLOs): This course will make to student to:	
1	Comprehend Software Development Life Cycle for software development.
2	Discuss an idea of using various process models in the software industry according to given circumstances.
3	Realize how Analysis, Design, Implementation and Maintenance processes are conducted in a software project.
4	Explore the basics of software project management concepts, principles and practices.
5	Apply different methods of estimation for software project development and management.

Course Code	Course Title	Teaching & Learning Scheme							
		Classroom Instruction (CI) (in hrs / sem)		Lab Instruction (LI) (in hrs / sem)	Self-Learning (SL) (in hrs / sem)	Term Work (TW) (in hrs / sem)	Assessment (hrs / sem)	Total no. of Hours per sem	Total Credits (C)* (Total Hours/30)
		L	T	P	SL	TW	A		
HSIS01	Software Engineering and Project Management	42	-	-	14	27	7	90	3

Sl. No.	Date	Topic	Remarks
UNIT 1			
1.	02/09/2025	Software And Software Engineering: The Nature of Software, Software Engineering, The Software Process, Software Engineering Practice.	
2.	03/09/2025	The Software Process: Process Models: A Generic Process Model, Defining a Framework Activity, Identifying a Task Set, Process	
3.	04/09/2025	Assessment and Improvement, Prescriptive Process Models, The Waterfall Model,	
4.	09/09/2025	Prototyping Process Model, Evolutionary Process Model,	

5.	10/09/2025	Unified Process Model, Product and Process.	
6.	11/09/2025	Study Hour: Revision of Framework Activities and Software Process models,	
7.	12/09/2025	Agility And Process: What Is Agility? Agility and the Cost of Change, What Is an Agile Process? Agility Principles The Politics of Agile Development,	
8.	16/09/2025	Scrum, Scrum Teams and Artifacts,	
9.	17/09/2025	Sprint Planning Meeting, Daily Scrum Meeting,	
10.	18/09/2025	Study Hour: Revision of Agile Software Process model and SCRUM	
11.	19/09/2025	Sprint Review Meeting, Sprint Retrospective.	
UNIT II			
12.	25/09/2025	Understanding Requirements: Definition of Requirements Engineering, Establishing the Groundwork, Requirements Gathering,	
13.	26/09/2025	Collaborative Requirements Gathering, Usage Scenarios, Elicitation Work Products, Developing Use Cases, Building the Analysis Model,	
14.	30/09/2025	Elements of the Analysis Model, Analysis Patterns, Negotiating Requirements	
15.	03/10/2025	Requirements Monitoring and Validating Requirements.	
16.	04/10/2025	Requirements Modeling: Requirements Analysis, Overall Objectives and Philosophy, Analysis Rules of Thumb,	
17.	06/10/2025	Analysis Rules of Thumb, Requirements Modeling Principles, Scenario-Based Modeling, Actors and User Profiles,	
18.	08/10/2025	Creating Use Cases, Documenting Use Cases, Class-based Modeling Identifying Analysis Classes,	
19.	09/10/2025	Study Hour: Revision of Requirements modeling	
20.	10/10/2025	Defining Attributes and Operations, UML Class Models,	
21.	16/10/2025	Class-Responsibility-Collaborator Modeling.	
UNIT III			
22.	17/10/2025	Study Hour: Revision of UML diagrams	
23.	21/10/2025	Design Concepts: Definition of software design, Design Within the Context of Software Engineering, The Design Process- Software Quality Guidelines and Attributes, The Evolution of Software Design,	
24.	23/10/2025	Study Hour: Revision of Software Design Process	
25.	24/10/2025	Design Concepts - Abstraction, Architecture, Patterns, Separation of Concerns, Modularity, Information Hiding, Functional Independence,	
26.	25/10/2025	Stepwise Refinement, Refactoring, Design Classes, Design Model-Design Modeling Principles, Data Design Elements, Architectural Design Elements,	
27.	28/10/2025	Interface Design Elements, Component-Level Design Elements, Deployment-Level Design Elements.	
28.	29/10/2025	Architectural Design: Software Architecture, Agility and Architecture, Architectural Styles, Architectural Considerations.	
29.	30/10/2025	Study Hour : Revision of Software Architecture	

30.	31/10/2025	Component-Level Design: What Is a Component, What Is a Component?, An Object-Oriented View,	
31.	03/11/2025	The Traditional View, A Process-Related View,	
32.	04/11/2025	Designing Class-Based Components- Basic Design Principles,	
33.	05/11/2025	Component-Level Design Guidelines, Cohesion, Coupling.	
UNIT IV			
34.	06/11/2025	Study Hour: Revision of component level design	
35.	07/11/2025	Software Quality Metrics:	
36.	10/11/2025	Software Metrics And Analytics: Software Measurement, Measures, Metrics	
37.	11/11/2025	Indicators, Attributes of Effective Software Metrics,	
38.	12/11/2025	Software Analytics, Product Metrics,	
39.	18/11/2025	Metrics for the Requirements Model.	
40.	19/11/2025	Project Management Concepts: The Management Spectrum, The People, The Product, The Process, The Project, People, The Stakeholders Team Leaders,	
41.	20/11/2025	Study Hour: Revision of Quality metrics and product metrics	
42.	21/11/2025	The Software Team, Coordination and Communications Issues, Product Software Scope,	
43.	22/11/2025	Problem Decomposition, Process, Melding the Product and the Process, Process Decomposition, Project,	
44.	24/11/2025	The W5HH Principle, Critical Practices	
UNIT V			
45.	25/11/2025	Creating A Viable Software Plan: Comments on Estimation, The Project Planning Process, Software Scope and Feasibility, Resources, Human Resources,	
46.	26/11/2025	Reusable Software Resources, Environmental Resources,	
47.	27/11/2025	Data Analytics and Software Project Estimation, Decomposition and Estimation Techniques,	
48.	02/12/2025	Software Sizing, Problem-Based Estimation, An Example of LOC-Based Estimation,	
49.	03/12/2025	Study Hour: Revision of Software project planning and resources	
50.	04/12/2025	An Example of FP-Based Estimation, An Example of Process-Based Estimation	
51.	05/12/2025	An Example of Estimation Using Use Case Points,	
52.	06/12/2025	Reconciling Estimates, Estimation for Agile Development.	
53.	09/12/2025	Project Scheduling: Basic Principles, The Relationship Between People and Effort,	
54.	10/12/2025	Defining a Project Task Set, A Task Set Example, Refinement of Major Tasks,	
55.	11/12/2025	Defining a Task Network Scheduling Time-Line Charts, Tracking the Schedule.	

56.	12/12/2025	Revision of previous year question papers	
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Important Dates to be remembered:

Sl. No.	Important Events	Dates
1.	I – Test	13 th -15 th Oct. 2025
2.	Last date for dropping of course	21 th Oct. 2025
3.	II – Test	27 th -29 th Nov. 2025
4.	Last date for withdrawal of course	1 st Dec. 2025
5.	Last working day	13 th Dec. 2025
6.	Preparation Holidays	14 th Dec.- 19 th Dec. 2025
7.	Semester End Examination	20 th -05 th Jan. 2026
8.	Announcement of Results	17 th Jan. 2026

Activities to meet Teaching Learning Scheme:

Sl. No.	Activity Planned	Number of Hours
1.	Class Room Teaching	42
2.	Lab Related Activities	--
3.	Formative Assessment [Test (2 No.) +Quiz (2 No.) + Semester End Exam]	07
4.	Student Study Hours—Self Learning	14
5.	Activity Based Learning: I Activity: Case study with SRS document preparation: Prepare the SRS document/software project report using software engineering methodology for the following scenarios or the applications. 1. Problem Analysis and Project Planning - Thorough study of the problem– Identify Project scope, Objectives and Infrastructure. 2. Software Requirement Analysis –Describe the individual Phases/modules of the project and Identify deliverables. 3. Identification of the functional and non-functional requirements from the detailed problem statement. 4. Software Modelling: Analysis and Designing - Develop the following UML diagram for the SRS document prepared for the applications. a. Use case diagrams, b. Activity Diagrams c. DFD-0 diagrams d. DFD-1 diagrams e. Sequence diagrams 5. The report including the detailed problem statement, SRS report, and requirements analysis and modeling report needs to be submitted for evaluation. 6. Various real time Applications can be allotted to a team of two members. Evaluation of the Activity-I (12 Hours) 1. Identifying areas for which you want to prepare the SRS document by literature review - 02 Hours. 2. Meeting and discussing (online or offline) with the faculty and fixing the	12+6+9 = 27

	problem statement - 01 Hour. 3. Design and creation of various UML diagrams - 08 Hours 4. Presentation and submitting the final report - 01 Hour II. Writing Assignment with Problems on Software engineering and cost estimation concepts. (6 Hours) 1. Submission of the final assignment report and evaluation. (Questions of Blooms level L3 and Higher) III. Completion of the MOOC course from Infosys Springboard (7 Hours) 1. A course Titled “Agile and Scrum Training” Level: Intermediate, Duration: 6 hours Course contents: i. Practices that underpin Agile and Scrum, and how they can be applied to various types of projects. ii. Explore the Scrum framework, including its roles, events, artifacts, and rules 2. Evaluation and Presentation of knowledge gained and submitting the certificate - 1 Hour. Total:	90
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Text Books:

1.	Roger. S. Pressman, Bruce R. Maxim-- Software Engineering-A Practitioners approach. 9 th Edition, Tata-McGraw Hill. 2020,
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Reference Books:

1.	Pankaj Jalote-- An Integrated Approach to Software Engineering. Narosa Publications, 2019.
2.	Ilene Burnstein-- Practical Software Testing: A Process-Oriented Approach, Springer International Edition, 2016.
3.	Paul C. Jorgensen, Byron DeVries-- Software Testing, A Craftsman’s Approach, 5 th Edition, Auerbach Publications, 2021.

Course Outcomes: Upon completion of this course, the student will be able to:

CO1	Describe and Apply Software Development Life Cycle and its different phases of software process.
CO2	Apply the Requirements Engineering Techniques to paraphrase the actual requirements of applications.
CO3	Apply the fundamental concepts and principles of Software Design in development of software.
CO4	Describe the basics of software project management concepts, principles and practices.
CO5	Apply and Analyze the different methods for estimation of software projects.

Mapping of Course Outcomes (COs) to Program Outcomes (POs) & Program Specific Outcomes (PSOs)

		POs											PSOs		
		1	2	3	4	5	6	7	8	9	10	11	1	2	3
COs	CO1	3		3									3		
	CO2		3	3		2				2	2		3		
	CO3			3		2							3		
	CO4			3									2		
	CO5			3									2		
AVG		3	3	3		2				2	2		3		

1: Low association 2: Moderate association 3: High association

Course delivery methods, assessment tools and sample questions:

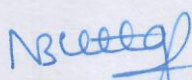
CO1	Describe and Apply Software Development Life Cycle and its different phases of software process.
Delivery Methods	Black board Teaching, PowerPoint Presentation,
Assessment Tools	CIE- Test 1, SEE
Sample Questions	1. Explain Spiral process model. Differentiate between waterfall model and spiral model. (6M) (L1,CO1,PO1) 2. Explain the frame work activity used during personal software process. (6M) (L1,CO1,PO1) 3. Illustrate the advantages of the Unified Process model with an example. (6M) (L1,CO1,PO1) 4. Define software Engineering. Explain the best Software Engineering Practice. (8M) (L1,CO1,PO1) 5. What is an agile process? Explain agile process model. (8M) (L1,CO1,PO1)

CO2	Apply the Requirements Engineering Techniques to paraphrase the actual requirements of applications.
Delivery Methods	Black Board Teaching, Group Activity, Power point Presentation, Demonstration using Star UML tool for UML diagrams.
Assessment Tools	CIE-Test 1, SEE, Assignment
Sample Questions	1. Explain in detail about requirements engineering tasks (6M) (L2,CO2,PO2) 2. What are software requirements? How to analyze the requirements. (6M) (L2,CO2,PO2) 3. Explain briefly about requirements management. (6M) (L2,CO2,PO2) 4. What is scenario based modeling? Write any two use cases of the same model.(6M) (L2,CO2,PO2) 5. Write the Scenario diagram for a ATM banking applications (6M) (L2,CO2,PO3)

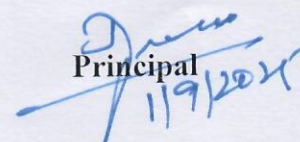
CO3	Apply the fundamental concepts and principles of Software Design in development of software.
Delivery Methods	Black Board Teaching, Power point Presentation
Assessment Tools	CIE: Test 2, SEE, Assignment
Sample Questions	1. What are the design principles? Explain in detail? (6M) (L2,CO3,PO2) 2. Explain the principles of component level design. (6M) (L2,CO3,PO2) 3. What are the characteristics of a good software design? (6M) (L2,CO3,PO2) 4. Identify the different types of architectural styles suitable for Banking and Online Shopping applications. (8M) (L2,CO3,PO2) 5. Illustrate the guidelines for component level design?(6M) (L2,CO3,PO3)

CO4	Describe the basics of software project management concepts, principles and practices.
Delivery Methods	Black Board Teaching, Power point Presentation
Assessment Tools	CIE: Test 2, SEE, Assignment
Sample Questions	1. What are software quality metrics, and why are they important in software development? (6M) (L2,CO4,PO2) 2. How can software quality metrics be used to identify areas for improvement in software development? (6M) (L2,CO4,PO2) 3. What are product metrics, and how do they differ from process metrics in software development? (8M) (L2,CO4,PO3) 4. How does problem decomposition aid in breaking down complex software projects into manageable tasks? (6M) (L2,CO4,PO2)

CO5	Apply and Analyze the different methods for estimation of software projects.
Delivery Methods	Black Board Teaching, Power point Presentation
Assessment Tools	CIE: Test 2, SEE, Assignment
Sample Questions	1. What are the different types of resources needed in a software project, and how do they contribute to the success of the project? (6M) (L2,CO5,PO2) 2. How do human resources, reusable software resources, and environmental resources affect software planning? (6M) (L2,CO5, PO3) 3. How are timeline charts used to schedule and manage tasks in a software project? (6M) (L2,CO5, PO3) 4. How does the relationship between people and effort affect project timelines and scheduling? (8M) (L2,CO5, PO3)


 Faculty 01/09/2025


 HoD 01/09/2025


 Principal 11/9/2024