Lesson Plan

T.E. (CE- Section A) (Semester V)

Subject: SOFTWARE ENGINEERING

Subject code: CSC502

Teacher-in-charge: Dr. B. S. Daga

Academic Term: July – November 2022

Module		Content	Hrs
1		**Introduction To Software Engineering and Process Models**	**7**
	1.1	Nature of Software, Software Engineering, Software Process, Capability Maturity Model (CMM)	
	1.2	Generic Process Model, **Prescriptive Process Models:** The Waterfall Model, V-model, Incremental Process Models, Evolutionary Process Models, Concurrent Models, Agile process, Agility Principles, Extreme Programming (XP), Scrum, Kanban model	
2		**Requirements Analysis and Modelling**	**4**
	2.1	Requirement Elicitation, Software requirement specification (SRS), Developing Use Cases (UML)	
	2.2	Requirement Model – Scenario-based model, Class-based model, Behavioural model.	
3		**Project Scheduling and Tracking**	**7**
	3.1	Management Spectrum, 3Ps (people, product and process)	
	3.2	Process and Project metrics	
	3.3	Software Project Estimation:LOC, FP, Empirical Estimation Models - COCOMO II Model, Specialized Estimation Techniques	
	3.4	Project scheduling:Defining a Task Set for the Software Project, Timeline charts, Tracking the Schedule, Earned Value Analysis	
4		**Software Design**	**7**
	4.1	Design Principles, Design Concepts, Effective Modular Design – Cohesion and Coupling	
	4.2	Architectural Design	
	4.3	Component-level design	
	4.4	User Interface Design	
5		**Software Risk, Configuration Management & Quality Assurance**	**7**
	5.1	Risk Identification, Risk Assessment, Risk Projection, RMMM	
	5.2	Software Configuration management, SCM repositories, SCM process	

	5.3	Software Quality Assurance Task and Plan, Metrics, Software Reliability, Formal Technical Review (FTR), Walkthrough	
6		**Software Testing and Maintenance**	**7**
	6.1	Strategic Approach to Software Testing, Unit testing, Integration testing, Verification, Validation Testing, System Testing	
	6.2	Software Testing Fundamentals, White-Box Testing , Basis Path Testing, Control Structure Testing, Black-Box Testing	
	6.3	Software maintenance and its types, Software Re-engineering, Reverse Engineering	

Course Objectives:

1. To provide knowledge of software engineering discipline.
2. To analyze risk in software design and quality.
3. To introduce the concept of advance software methodology

Course Outcomes:

Upon completion of this course students will be able to:

CSC502.1: Identify requirements & assess the process models.
CSC502.2: Plan, schedule and track the progress of the projects.
CSC502.3: Design the software projects.
CSC502.4: Do testing of software project.
CSC502.5: Identify risks, manage the change to assure quality in software projects

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CSC502.1		1												
CSC502.2										1	1			
CSC502.3			1											
CSC502.4				1										
CSC502.5							1							

Provide justification of PO to CO mapping

Course Outcome	Competency	Performance Indicator
CSC502.1	2.1 Demonstrate an ability to identify and formulate complex engineering problem	2.1.2 Identify processes/modules of a computer-based system and parameters to solve a problem
	2.2 Demonstrate an ability to	2.2.4 Compare and contrast alternative

	formulate a solution plan and methodology for an engineering problem	solution/methods to select the best methods 2.2.5 Compare and contrast alternative solution processes to select the best process.
	2.3 Demonstrate an ability to formulate and interpret a model	2.3.1 Able to apply computer engineering principles to formulate modules of a system with required applicability and performance.
CSC502.2	10.1 Demonstrate an ability to comprehend technical literature and document project work	10.1.1 Read, understand and interpret technical and non-technical information 10.1.2 Produce clear, well-constructed, and well-supported written engineering documents 10.1.3 Create flow in a document or presentation – a logical progression of ideas so that the main point is clear
	11.3 Demonstrate an ability to plan/manage an engineering activity within time and budget constraints	11.3.1 Identify the tasks required to complete an engineering activity, and the resources required to complete the tasks. 11.3.2 Use project management tools to schedule an engineering project, so it is completed on time and on budget.
CSC502.3		

	3.4 Demonstrate an ability to advance an engineering design to defined end state	3.4.1 Able to refine architecture design into a detailed design within the existing constraints. 3.4.2 Able to implement and integrate the modules. 3.4.3 Able to verify the functionalities and validate the design.
CSC502.4		
	4.3 Demonstrate an ability to analyze data and reach a valid conclusion	4.3.1 Use appropriate procedures, tools and techniques to and analyze collect data 4.3.2 Critically analyze data for trends and correlations, stating possible errors and limitations 4.3.3 Represent data (in tabular and/or graphical forms) so as to facilitate analysis and explanation of the data, and drawing of conclusions 4.3.4 Synthesize information and knowledge about the problem from the raw data to reach appropriate conclusions
CSC502.5	7.1 Demonstrate an understanding of the impact of engineering and industrial practices on social, environmental and in economic contexts	7.1.1 Identify risks/impacts in the life-cycle of an engineering product or activity 7.1.2 Understand the relationship between the technical, socio-economic and environmental dimensions of sustainability

CO Assessment Tools:

Course Outcomes		*Indirect Method (20%)*				
	Unit Test	Assignment	Practical	End Sem Exam (T)	End Sem Exam (Oral)	Course exit survey
	1	1	1			
CSC502.1	20%	20%	20%	20%	20%	100%

CSC502.2	20%	20%	20%	20%	20%	100%
CSC502.3	20%	20%	20%	20%	20%	100%
CSC502.4	20%	20%	20%	20%	20%	100%
CSC502.5	--	30%	30%	20%	20%	100%

CO calculation= (0.8 *Direct method + 0.2*Indirect method)

Rubrics for assessing Course Outcome with each assessment tool:

Assignments:

Indicator	Average	Good	Excellent	Marks
Organization (2)	Readable with some mistakes and structured (1)	Readable with some mistakes and structured (1)	Very well written and structured (2)	
Level of content(4)	Minimal topics are covered with limited information (2)	Limited major topics with minor detailsare presented(3)	All major topics with minor details are covered (4)	
Depth and breadth of discussion(4)	Minimal points with missing information (1)	Relatively more points with information (2)	All points with in depth information(4)	
Total Marks(10)				

Curriculum Gap identified:

Non Algorithmiccost estimation techniques

Content beyond syllabus:

Non Algorithmic cost estimation techniques

Modes of content delivery

Modes of Delivery	Brief description of content delivered
Class room lecture	1. Introduction To Software Engineering and Process

	Models 2. Requirements Analysis and Modeling 3. Software projects Design 4. Software testing 5. Software Quality Assurance
Assignments	Assignment 1 is based on : CO1Introduction To Software Engineering and Process Models CO2 Requirements Analysis and Modeling Assignment 2 is based on : CO 3: Design the software projects. CO 4: Do testing of software project. C0 5: Identify risks, manage the change to assure quality in software projects.
Quizzes	Quiz 1: 1. Process Models 2. Requirements Analysis and Modeling 3. Software Project Design Quiz 2: 1. Software project testing 2. Risks, change management 3. Software quality assurance.

Text books:
1. T1. Roger Pressman, Software Engineering: A Practitioners Approach, (6th Edition),McGraw Hill, 2010
2. T2. Ian Somerville, Software Engineering, 9th edition, Addison Wesley, 2011

Reference Books:

3. R1. Eric J. Braude and Micheal E. Bernstein, Software Engineering Modern Approach, 2^{nd}edition, Wiley, 2011.
4. R2. Ali Behforooz Fredrick Hudson, Software Engineering Fundamentals, Oxford UniversityPress, 2006.
5. R3. PankajJalote, " IntegratedSoftware Engineering", Wiley.

Lesson Plan

CLASS	TE Computer Engineering (A), Semester V
Academic Term	July- October 2022
Subject	**Software Engineering (CSC502)**

Periods (Hours) per week	*Lecture*	3	
	Practical	2	
	Tutorial		

Evaluation System		*Hours*	*Marks*
	Theory examination	3	80
	Internal Assessment	--	20
	Practical/Oral Examination	--	25
	Term work	--	25
	Total	--	100

Time Table	*Day*	*Time*
	Tuesday	2.30-3.30 PM
	Wednesday	9.45-10.45 AM
	Thursday	1.30-2.30 PM

Course Content and Lesson plan

Week	Lecture No.	Date Planned	Date Actual	Topic	Remarks
Module 1: Introduction To Software Engineering and Process Models					
	1	18-07-22		Nature of Software, Software Engineering,	
	2	20-07-22		Software Process, Capability Maturity Model (CMM)	
	3	21-07-22		Generic Process Model,	
	4	25-07-22		Prescriptive Process Models:The Waterfall Model,	
	5	27-07-22		V-model, Incremental Process Models,	
	6	28-07-22		Evolutionary Process Models , Concurrent Models,	
	7	02-08-22		Agile process, Agility Principles, Extreme Programming (XP), Scrum, Kanban model	
Module 2: Requirements Analysis and Modelling					
	8	03-08-22	26-07-22	Requirement Elicitation, Software requirement specification (SRS),	
	9	04-08-22	27-07-22	Developing Use Cases (UML)	
	10	05-08-22	29-07-22	Requirement Model – Scenario-based	
	11	10-08-22		Class-based model, Behavioral model.	
Module 3: Project Scheduling and Tracking					
	13	11-08-22	19-08-22	Management Spectrum, 3Ps (people, product and process)	

	14	12-08-22		Process and Project metrics	
	15	17-08-22		**Software Project Estimation:** LOC, FP, Empirical Estimation Models - COCOMO II Model,	
	16	18-08-22		Empirical Estimation Models - COCOMO II Model, Specialized Estimation Techniques	
	17	23-08-22		**Project scheduling:** Defining a Task Set for the Software Project, Timeline charts,	
	18	24-08-22		Timeline charts, Tracking the Schedule,	
	19	25-08-22		Earned Value Analysis	Assignment 01
			Module 4: Software Design		
	20	30-08-22		Design Principles, Design Concepts,	
	21	08-09-22		Effective Modular Design – Cohesion and Coupling.	
	22	13-09-22		Architectural Design	
	23	14-09-22		Component-level design	
	24	15-09-22		Component-level design	
	25	20-09-22		User Interface Design	
			Module 5: Software Risk, Configuration Management & Quality Assurance		
	26	21-09-22		Risk Identification, Risk Assessment,	
	27	22-09-22		Risk Projection, RMMM	
	28	23-09-22		Software Configuration management, SCM repositories, SCM process	
	20	27-09-22		Software Quality Assurance Task and Plan,	
	30	28-09-22		Metrics, Software Reliability,	Assignment 02
	31	29-09-22		Formal Technical Review (FTR), Walkthrough.	
			Module 6: Software Testing and Maintenance		
	32	4-10-22		Strategic Approach to Software Testing, Unit testing,	
	33	6-10-22, 11-10-22		Integration testing, Verification, Validation Testing, System Testing	
	35	12-10-22		Software Testing Fundamentals, White-Box Testing ,	
	36	13-10-22		Basis Path Testing, Control Structure Testing,	
	37	20-10-22 (2)		Black-Box Testing, Software maintenance and its types,	
	39	21-10-22		Software Re-engineering, Reverse Engineering	Quiz 2
	40	28-10-22		Problem solving and case study	

	42			UT1: 5-09 to 07-09
				UT2 – 17-10 to 19-10
Total	42			

Submitted By	Approved By
Dr. B. S. Daga	i) Dr. Sujata Deshmukh Sign:
	ii) Prof. RoshniPadate Sign:
Date of Submission:	**Date of Approval:**
Remarks by DQAC (if any)	