Indraprastha College for Women
University of Delhi

Course Name:	B. Sc. (Hons.) Computer Science
Paper Title:	Software Engineering
Unique Paper Code:	2342013503
Semester:	V
Faculty(s):	Vimala Kumari
Year:	2025

Unit No.	Learning Objective	Lecture No.	Topics to be Covered
I	Introduction to Software engineering and process models.	1	**Introduction** Software Engineering - A Layered Approach
		2	Software Process – Process Framework
		3	Umbrella Activities
		4	Process Models – Waterfall Model
		5	Evolutionary process Model: Prototyping
		6	Spiral Model
		7	Incremental Model,
		8	Introduction to Agile – Agility Principles, Agile Model – Scrum.
II	Creation of SRS, DFD, USE Case etc.	**9**	**Software Requirements Analysis and Specifications**
		10	Use Case Approach,
		11	Software Requirement Specification Document
		12	Flow oriented Model,
		13	Data Flow Model (example-1)
		14	Data Flow Model (example-2)
III	Different types of software testing	**15**	**Software Testing:** Strategic Approach to Software Testing
		16	Unit Testing
		17	Integration Testing
		18	Validation Testing
		19	System Testing
		20	Black-Box
		21	White Box Testing, Basis Path Testing

IV	Concepts of Design modelling	**22**	**Design Modelling:** Translating the Requirements model into the Design Model,
		23	The Design Process
		24	Design Concepts:
		25	Abstraction & Modularity
		26	Functional Independence;
		27	Structure Charts
V	Different types of software metrics and project estimations.	**28**	**Software Metrics and Project Estimations** Function based Metrics,
		29	Software Measurement
		30	Metrics for Software Quality
		31	Software Project Estimation
VI	Quality Control and Risk Management	32	Project Scheduling: Timeline charts,
		33	Tracking the schedule
		34	**Quality Control and Risk Management** Quality Control and Quality Assurance,
		35	Software Risks,
		36	Risk Identification,
		37	Risk Projection and Risk Refinement
		38	Risk Mitigation, Monitoring and Management
		39	Software Process Assessment and Improvement Capability Maturity Model Integration (CMMI)
		40	Revision

Unit	TOPICS
I	**Introduction:** Software Engineering - A Layered Approach; Software Process – Process Framework, Umbrella Activities; Process Models – Waterfall Model, Incremental Model, and Evolutionary process Model (Prototyping, Spiral Model); Introduction to Agile, Agile Model – Scrum.
II	**Software Requirements Analysis and Specification:** Use Case Approach, Software Requirement Specification Document, Flow-oriented Model, Data Flow Model
III	**Design Modeling:** Translating the Requirements model into the Design Model, The Design Process, Design Concepts - Abstraction, Modularity and Functional Independence; Structure Charts.
IV	**Software Metrics and Project Estimation:** Function based Metrics, Software Measurement, Metrics for Software Quality; Software Project Estimation (FP based estimations); Project Scheduling (Timeline charts, tracking the schedule).
V	**Quality Control and Risk Management:** Quality Control and Quality Assurance, Software Process Assessment and Improvement; Software Risks, Risk Identification, Risk Projection, Risk Mitigation, Monitoring and Management.

VI	**Software Testing:** Strategic Approach to Software Testing, Unit Testing, Integration Testing, Validation Testing, System Testing; Black-Box and White Box Testing, Basis Path Testing.

S. No.	Name of Authors/Books/Publishers
1.	Pressman, R.S. Software Engineering: A Practitioner's Approach, 9th edition, McGraw-Hill, 2020.
2.	Aggarwal, K.K., Singh, Y. Software Engineering, 3rd edition, New Age International Publishers, 2007.
3.	Jalote, P. An Integrated Approach to Software Engineering, 3rd Edition, Narosa

	Paper Components		
Credits	**Lecture (L)**	**Tutorial (T)**	**Practical (P)**
6	**4**	**0**	**2**

Assessment Scheme

S.No.	Component	Marking Scheme	Total Marks
1	Internal Assessment		30
	• Assignment/Quiz/Project/Presentation	12	
	• Class Test	12	
	• Attendance	6	
2.	Practical		50
	• Continuous Assessment	20	
	• End Term Written/Practical Exam	20	
	• Viva	10	
3.	End Semester Examination		90