Units	Topic covered	Content	Reference	No. of Lectures
Unit 1:	Software Engineering- A Layered Approach	Ch 1 - 1.2		
Introduction	Software Process–Process Framework,	Ch 1- 1.3		
	Umbrella Activities	(excluding 1.3.3)		
	Process Models – Waterfall Model,	Ch 2 - 2.1,	[1]	0
	Evolutionary process Model (Prototyping,	2.5.1, 2.5.2, 2.5.3		9
	Spiral Model)			
	Introduction to Agile, Agile Model-Scrum	Ch 3- 3.1, 3.4		
	Incremental Model	Ch 2 – 2.3.1	[2]	
Unit 2:	Use Case Approach	Ch 3 - 3.4.1, 3.4.2		
Software	SRS Document	Ch 3 - 3.1, 3.3.1,		
Requirements		3.3.2		
Analysis and		* Ch. 3 – 3.3.4	[3]	6
Specifications	Flow oriented Modeling - Data Flow	3.2.2 (excluding		
	Modeling	The Structured		
		Analysis Method)		
Unit 3:	Translating Requirements model into Design	Ch 5 - 5.1 to 5.4.1		
Design	Model, The Design Process,		[2]	8
Modeling	Design Concepts - Abstraction, Modularity,		[2]	0
	Functional Independence; Structure Charts			
Unit 4:	Software Measurement	Ch 23 - 23.1.1		
Software	Metrics for Software Quality	Ch 23 - 23.8		
Metrics and	Software Project Estimation (FP based	Ch 25- 25.6.1,	[1]	7
Project	estimation), Function based Metrics	25.6.4		/
Estimations	Project Scheduling (Timeline charts, tracking the schedule)	Ch 25 - 25.10		
Unit 5:	Quality Control and Quality Assurance	Ch 15 -15.4		
Quality		Ch 17 -17.2		
Control and	Software Process Assessment and	Ch 28 - 28.3		
Risk	Improvement		[1]	5
Management	Software Risks, Risk Identification, Risk	Ch 26 – 26.1. 26.2,		
0	Projection, Risk Mitigation, Monitoring and	26.3.1, 26.4.1, 26.6		
	Management	, ,		
Unit 6:	Strategic Approach to Software Testing,	Ch 8 - 8.1, 8.2, 8.5		
Software	Unit Testing, Integration Testing,	8.3-8.3.2, 8.4 upto		
Testing	System Testing; Black-Box and White Box	408, 8.4.2, 8.6	[2]	10
	Testing, Basis Path Testing			
	Validation Testing,			
			Total	45

NEP - B.Sc. (Hons.) Computer Science Guidelines for DISCIPLINE SPECIFIC CORE COURSE (DSC-15) - Software Engineering Sem V (July 2024 Onwards)

* To be covered in Practical only

References

- 1. Pressman, R.S., & Maxim, B.R. (2020). *Software Engineering: A Practitioner's Approach*. 9th ed. McGraw-Hill
- 2. Aggarwal, K. K., & Singh, Y. (2007). *Software Engineering*. 3rd ed. New Age International Publishers.
- Jalote, P. An Integrated Approach to Software Engineering, 3rd ed., Narosa Publishing House, 2005.

Practicals

The students document, design and code a module of a Software Project using an appropriate Software Process model. Software Project should address the following concepts of Software Engineering.

- 1. Problem Statement, Process Model
- 2. Requirement Analysis: Create Data Flow, Data Dictionary, Use Cases, Sequence Diagram, Software Requirement Specification Document
- 3. Project Management: Timeline Chart, Compute FP, Effort, Cost, Risk Table.
- 4. Design Engineering: Architectural Design, Pseudocode of a small module.
- 5. Coding: Develop at least a single module using any programming Language
- 6. Testing: Compute Basis path set for at least a single module from the project, Generate test cases.

Some of the Sample Projects are given below though they are not limited to this.

- 1. Criminal Record Management: Implement a criminal record management system for jailers, police officers and CBI officers
- 2. DTC Route Information: Online information about the bus routes and their frequency and fares.
- 3. Car Pooling: To maintain a web-based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
- 4. Patient Appointment and Prescription Management System
- 5. Organized Retail Shopping Management Software
- 6. Online Hotel Reservation Service System
- 7. Examination and Result computation System
- 8. Automatic Internal Assessment System
- 9. Parking Allocation System
- 10. Wholesale Management System