

Software Engineering (BHCS11) Core Course - (CC)

S. No.	Topic Covered	Contents	Reference	No. of Lectures
1	Unit 1: 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 – Agility Principles, Agile Model – Scrum.	Ch 2: 2.1 -2.2.2 Ch 3: 3.1, 3.2 Ch 4: 4.1-4.1.3 Ch 5: 5.1,5.3-5.3.1, 5.5.1	[1]	10
2	Unit 2: Software Requirements Analysis and Specifications Use Case Approach, Software Requirement Specification Document, Flow oriented Modeling, Data Flow Modeling, Sequence Diagrams	Ch 3: 3.1.1, 3.2, 3.4.5 3.5-3.5.1, 3.5.2, 3.6,3.7 Pg 92 Ch 5: 5.6.2	[2]	8
3	Unit 3: Design Modeling Translating the Requirements model into the Design Model, The Design Process, Design Concepts: Abstraction, Modularity and Functional Independence; Architectural Mapping using Data Flow.	Ch 5:5.1-5.4,	[2]	8
4	Unit 4: Software Metrics and Project Estimations Function based Metrics, Software Measurement, Metrics for Software Quality; Software Project Estimation (FP based estimations, COCOMO II Model); Project Scheduling (Timeline charts, tracking the schedule).	Ch 30: 30.1.1,30.2 Ch 32: 32.3 Ch 33: 33.7.2 Ch 34: 34.5.1	[1]	8
5	Unit 5: Quality Control and Risk Management Quality Control and Quality Assurance, Software Process Assessment and Improvement Capability Maturity Model Integration (CMMI); Software Risks, Risk Identification, Risk Projection and Risk Refinement, Risk Mitigation, Monitoring and Management.	Ch 19:19.1,19.2.3,19.4 Ch 21:21.2 Ch 35 Ch 37: 37.3	[1]	8
6	Unit 6 : Software Testing Strategic Approach to Software Testing, Unit Testing, Integration Testing, Validation Testing, System Testing; Black-Box and White Box Testing, Basis Path Testing	Ch 8: 8.1, 8.2, 8.3-8.3.2, 8.4 upto Pg 408, 8.4.2, 8.5,8.6	[2]	10
			Total	52

References

- [1] Pressman, R. S., & Maxim, B. R. (2015). *Software Engineering: A Practitioner's Approach*. 8th edition. McGraw-Hill.
- [2] Aggarwal, K. K., & Singh, Y. (2007). *Software Engineering*. 3rd edition. New Age International Publishers.

Practicals

The students also document, design and code of 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: Creating a Data Flow, Data Dictionary, Use Case, Sequence Diagram, Software Requirement Specification Document
3. Project Management: Timeline Charts, Computing 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.

Sample Projects:

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**