Software Engineering
MCS- 503

Block I

Unit I: Introduction to software engineering
 1.1 Basic issues in software engineering
 1.2 Structured programming
Unit II: Software life cycle model
 2.1 Basics of software life cycle and waterfall model
 2.2 Prototyping and spiral life cycle models
Unit III: Requirements analysis and specification
 3.1 Basic concepts in requirement analysis and specification
 3.2 Formal requirement specification
 3.3 Algebraic specification
Unit IV: Software design issues
 4.1 Basic concepts in software design
 4.2 An overview of current design approaches

Block II

Unit V: Function-oriented software design
 5.1 Data flow diagrams
 5.2 DFD model of a system
Unit VI: Basic concepts in object creation
 6.1 Structured design
Unit VII: Object modeling using UML
 7.1 Basic ideas on UML
 7.2 Use case model
 7.3 Class and interaction diagrams
 7.4 Activity and state chart diagram
Unit VIII: Object oriented software development
 8.1 Design Patterns
 8.2 Domain Modeling
Unit IX: User interface design
 9.1 Basic Concepts in User Interface Design
 9.2 Types of User Interfaces
 9.3 Component-Based GUI Development

Block III

Unit X: Coding and testing
 10.1 Code Review
 10.2 Black-Box Testing
 10.3 White-Box Testing
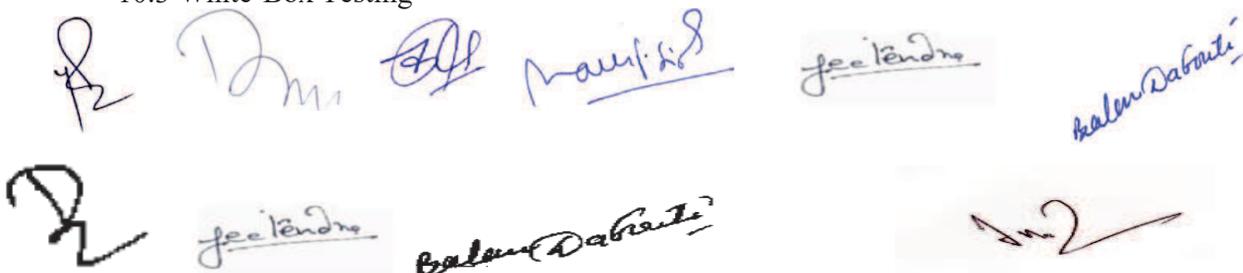
10.4 Debugging, Integration and System Testing

Unit XI: Software project planning

      11.1 Project Planning and Project Estimation Techniques

      11.2 COCOMO Model

      11.3 Staffing Level Estimation and Scheduling

Unit XII: Software project monitoring and control

      12.1 Organization and Team Structures

      12.2 Risk Management and Software Configuration Management

Unit XIII: Software reliability and quality management

      3.1 Software Reliability Issues

      13.2 Statistical Testing and Software Quality Management

      13.3 ISO 9000

      13.4 SEI CMM

Block IV

Unit XIV: Software maintenance

      14.1 Characteristics of Software Maintenance

Unit XV: Computer aided software engineering

      15.1 Basic ideas on CASE Tools

      15.2 Different Characteristics of CASE Tools

Unit XVI: Software Reuse

      16.1 Basic ideas on Software Reuse

      16.2 Reuse Approach

Unit XVII: Client server software development

      17.1 Basic Ideas on Client-Server Software Development and Client-Server Architecture

      17.2 CORBA and COM/DCOM.

Suggested Reading:

1. Pressman: Software Engineering, Tata McGraw Hill.
2. Jalote, Pankaj: An Integrated Approach to Software Engineering, Narosa Publications.
3. Fairley, R.E.: Software Engineering Concepts, McGraw-Hill.
4. Lewis, T.G.: Software Engineering, McGraw-Hill.
5. Mall, Rajib: Fundamental of Software Engineering, Third Edition, PHI
6. Ghezzi, Carlo: Fundaments of Software Engineering, PHI.
7. Shere: Software Engineering & Management, Prentice Hall.