

# 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: Fundamentals of Software Engineering, PHI.
7. Shere: Software Engineering & Management, Prentice Hall.