VEER NARMAD SOUTH GUJARAT UNIVERSITY SURAT

T.Y.B.Sc.

Computer Science

In force from June 2006

Paper - VI

Software Engineering

1.. Introduction to Software Engineering

1.1 Software, software Characteristics, Software Engineering
1.2 Software Development Phase, Requirement Analysis, Design, Coding, Testing and Maintenance
1.3 Effort Distribution with Phases
1.4 Software Development Process Models, Waterfall Model, Prototyping

2. Software Project Planning and Management

2.1 Role of Management in Software Development
2.2 Role of Matrix and Measures
2.3 Cost E$_t$stimation, Single Variable Models
2.4 Project Scheduling, Project Scheduling and Milestones
2.5 Team Structure, Project Monitoring and Planning, Timesheets, Reviews

3. Requirement Analysis

3.1 Study of Requirements
3.2 Structure Analysis
3.3 Data Flow Diagram and Data Dictionary
3.4 Requirement Specification, Characteristics of SRS, Components of SRS
3.5 Validation

4. System Design

4.1 Design Objectives
4.2 Design Principles, Problem Partitioning, Abstraction, Top-Down and Bottom-Up Strategies

5. Testing

5.1 Testing Fundamentals, Error Faults Failure and Reliability, Level of Testing, Test Case, and Criteria

6. **Introduction to CASE tools** –

7. A Case Study

List of Reference Books:

1) An Integrated Approach to Software Engineering, Pankaj Jalote, Narosa Publication
2) Software Engineering Approch, Roger Pressman, Galgotia Publication
3) System Analysis and Design, Elias Awad, Galgotia Publisher
4) Elements of System Analysis, Marvin Gore, Galgotia Publisher
5) Analysis and Design of Information System, James Seen, McGraw Hill
6) Software Engineering Concepts, Fairly R E, McGraw Hill
7) 'Software Engineering, Lewis T G, McGraw Hill

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Paper - VII
Computer Networks

(1) Network Fuddamentals

1.1 Introduction to Networks, Network Topologies and Types of Networks

1.1.1 What is Networking?

1.1.2 Exchange, Sharing, preserving and protecting Information, Sharing Hardware and software Resources, Need, Uses and Advantages of Network

1.1.3 Network in work places (Tools, Tasks and Personnel)

1.1.4 Clients, Servers and Peers based and Hybrid Networks, Server types

1.1.5 Network topologies (Bus, Star,, Ring', Star Bus, Star Ring, and Physical Mesh)

1.1.6 Network (Transmission) Media (Wires, Cables, Fiber Optics, Wave)

1.1.7 Defining Network Protocols (H/W Protocols, S/W protocols, H/W and S/W Interface)

1.2 OSI Model

1.2.1 Introduction to OSI Model

1.2.2 OSI Model Lower Layer Function (Physical and Data Link Layers), OSI Model Middle Layer Function (Network and Transport Layers), OSI Model Upper Layer Function (Scion, Presentation and Application Layers) 1.2.3 Upper Layer Devices

1.3 Major Protocol Suites

1.3.1 Reviews of Protocols, Models and Implementation

1.3.2 NetWare IPX/SPX Protocols (Lower, Middle and Upper Layer Protocols) '

1.3.3 Internet Protocols (Middle and Upper Layer Protocols)

1.3.4 Basics of Miscellaneous Protocols (SLIP, PPP, FDDI, X.25, Frame Relay, ISDN, B-ISDN, SONET, SDI], ATM, SMRS)

(2) Network Hardware and Software

2.1 Cards and Cables. Repeaters, Hubs, Router and Bridges

2.1.1 Network cards, Repeaters- its uses and selection criteria, Hubs (Chasis Hubs and Stackable Hubs)

2.1.2 Splitting Up Networks

2.1.3 Bridges (The Spanning Tree Protocol, Traffic Segmentation and Monitoring with examples)

2.1.4 Switches (Full Duplex Operation, various Switching Modes, Avoiding Switch overload, VLAN technologies, Applicabilities)

2.1.5 Routers (Protocols, A Routed Network examples, Protocol Specificity, Bridging and Routing compare, Protocol Address Conventions), Switch Routers

2.2 Network Operating Systems

2.2.1 Peer Network Operation Systems (Windows 95-98-NT workstation)

2.2.2 Client-Server Operating System (Common Features, Windows NT-2000, Novell Netware, Various flavours of UNIX)

2.2.3 Client Software (DOS Clients, Windows Clients, Macintosh Clients)

2.3 Novell Netware Fundamentals

2.3.1 File System (volumes), Directories, Files and Flages (i.e. attributes of the File), Administrative Commands, Making User and groups, assigning trustee directories & attributes, Login script, Security

3. Network Management and Security

3.1 Home Network Technologies. Understanding IEEEE Standards, Understanding Wireless Networks

3.2 Networking Essentials for Windows 98

3.2.1 Microsoft Networking Overview (Common Server Softwar types, Network Workstation types, Workstation Naming and Passwords), Sharing Files and Printers

3.2.2 Network software: (Drivers,. Protocols, Services, Redirectors, Multiple Transport Stack, Network Binding Interface)

3.2.3 Network Browsing (Browsing Network using and without Browser) 3.2.4 Integrating 98 workstation into a Windows NT/2000 Domain

3.3 Cross-Domain Management in Windows NT/2000 Networks

3.3.1 Need, Requirements and Advantages of Multi-Domain Networks

3.3.2 Multi-Domain Management Tasks, Trust Relationships and Fixing the Broken Trusts

3.3.3 Granting User Right and Extending File and Printer permissions across Domain, Cross-Domain Groups :,Local and Global Groups. Logging on from foreign Domains

3.3.4 Enterprise design; single and Multiple-Domain Model

3.4 Building An Intranet Infrastructure

3.4.1 Element of TCP/IP Networks, Designing Network and IP Address scheme and assigning IP address

3.4.2 Routing Issues, The TCPCON Utility, Testing IP Network

3.5 Network Security Concepts and Terminology

3.5.1 Definition of various types of Securities

3.5.2 Security problems and their Consequences (Theft, Unauthorized Disclosure, Information warfare, Accidental Data Loss)

3.5.3 Security in Window 98. UNHX, Netware, DOS and Window3.x

List of Reference Books:

1) Networking Complete, 1st Ed 2002, BPB Publication (Text Book)
2) Mastering Local Area networks, Christa Anderson & Mark Minasi, BPB Publication
3) Mastering Novell Netware, Currid C C, & C A Gillett, BPB Publication
4) MCSE: Networking Essentials Study Guide, TMH Publication New Delhi
5) Introduction to Local Area Networks
6) Computer Networks, Tenenbaum, PHI, New Delhi

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Paper - VIII
Computer Graphics

1. A survey of Computer Graphics

2. Overview of Graphics Systems

2.1 Video Display Devices, Ratser scan system and Random scan systems
2.2 Graphics Monitor and Workstations, Input Device, Hard Copy Devices
2.3 Graphics Software

3. Out Primitives

3.1 Points and Lines, Line Drawing Algorithm
3.2 Loading the frame buffer, Line function
3.3 Circle and Ellipse Generating and other Curve generating Algorithms, Parallel Curve Algorithms, Curve functions
3.4 Pixel addressing and object geometry, Filled area primitives, Fill area functions, Character generation

4. Attributes of Output Primitives

4.1 Line Attributes, Curve Attributes
4.2 Colour and Gray scale, Area fill attributes, Character attributes, Bundled Attributes, Anti-aliasing

5. Two Dimensional Geometric Transformation

5.1 Basic Transformations
5.2 Matrix Representation and Homogeneous Coordinate
5.3 Composite Transformations, Other Transformations, Transformation between coordinates system

6. Two Dimensional Geometric Transformations

6.1 The Viewing Pipeline, Viewing coordinate reference frame, Window to View-port
6.2 Clipping Operations, Point Clipping, Line Clipping, Polygon Clipping

7. Three Dimensional Concepts

7.1 Three Dimensional display methods, Parallel and Perspective Projection

List of Reference Books:

1) Computer Graphics, Donald Hearn; M Pauline Baker, PHI, New Delhi
2) Computer Graphics, Herrington, PHI, New Delhi
3) Principle of Computer Graphics, Newman & Sproul, McGraw Hill
4) Interactive Computer Graphics, Giloi W K , PHI, New Delhi
5) Computer Graphics,, R A Plastoce & G Kalley, McGraw Hill

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Paper - IX
Java Programming

H. Concept of Java Programming

1.1 Concept of Java virtual machine (JVM), Byte code
1.2 Java compiler, Java interpreter
1.3 Data type, Literals, Variables, Type conversion and casting
1.4 One dimensional and multi dimensional arrays

2. Operator and Control Statements

2.1 Arithmetic Operators, bitwise operators, logical operators, short circuit
2.2 Selection statement (if and switch), Iteration statements (Do While, While, For, Nested loops), Jump statements

3. Object Oriented Features of Java

3.1 Using new and this key word, Garbage collection concepts, Inheritance. Super keyword, method overriding
3.2 Finalizer() method, Overloading methods, Overloading constructors, Recursion
3.3 Concepts of Static class, Nested-elass, Inner classes and Abstract Class

4. Packages, Interfaces, Exception handling and multithreading

4.1 Defining Package and concept of packages, Defining interface and concept of interfaces
4.2 Concept of Exception handling
4.3 Use of try, catch, throw and finally
4.4 Concept of Java Thread, Thread priorities and Synchronization, Concept of multithreading

5. String Handling in Java

5.1 String Constructors, Special string operation, Character extraction
5.2 String Comparision, searching a string, modifying string, Data conversion, CaseConversion, String buffer methods "

6. Java.util package

6.1 Date Class and its methods, Calender class and currency class
6.2 Concept of java.util.zip and java.uitl.Package

7. JDBC — Java Database Connectivity

7.1 The JDBC API, JDBC Derivers, JDBC-ODBC Bridge
7.2 Alternative connectivity strategies
7.2.1 Introduction to RMI, Introduction to CORBA
7.2.2 Connectivity to Object Databases, Connectivity with Web-based database

8. Applet Class

8.1 Applet concept, Architecture of Applet, Appletmethods 8.2 Graphic class, using status window

9. AWT class

9.1 Layouts, Component class, Container class, Panel class, Window class, frame and canvas, Hiding and showing windows, Setting the windows direction, graphic class

9.2 AWT controls, their constructors, properties and methods

9.3 Menubar, Menultem class and their methods, Dialog box

10. Event Handling Mechanism in Applet

10.1 Events, Event Source and Event Listners

10.2 KeyEvent Class, Mouse Event Class, MouseWheel Event Class, TextEvent Class, WindowEvent Class

11. Advanced Java features

. 11.1 Introduction to JavaSwing, Benefits of Swing, Working with Swing — basic user interface components, Handling user events with Swings

List of Reference Books:

1) The Complete Refrence Java2, Herbert Schildt, TMH, New Delhi

2) Mastering JAVA2, John Zukowski, BPB

3) Teach Yourself Java2 platefrom in 21 days, Lame)' & Cadenhead, Tech Media

4) Java uin Nut shell, O'Relly Publication

5) Java Language Refrencve, O'Relly Publication