VEER NARMAD SOUTH GUJARAT UNIVERSITY UNIVESRITY, SURAT

T Y B Sc (Computer Science) w.e.f. June 2009

Computer Science 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 Estimation, 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 Cases 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

VEER NARMAD SOUTH GUJARAT UNIVERSITY , SURAT
T Y B Sc(Computer Science) with effect from June 2009
Paper VII : Computer Network

1. Network Fundamentals:

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 and Task)

1.1.4 Network topologies (Bus, Star, Ring, StarBus, Star Ring, Mesh)

1.1.5 Client/Serve , hybrid and Peer-Peer network.

1.1.6 Transmission media (H/W Protocols, S/w Protocols, H/W and S/W interfaces)

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 (Session, Presentation and Application Layers).

1.2.3 Upper Layer Devices

1.3 Major Protocol suites

1.3.1 What is protocol

1.3.2 Internet protocols (Middle and Upper layer Protocols)

2. Network hardware and Software

2.1 Network Cards and Cables, Repeaters, Hubs, Routers and Bridges.

2.1.1. Network cards, repeaters – its use and selection criteria.

2.1.2. Splitting up networks

2.1.3. Bridges – Use and working of bridges

2.1.4. Switches - Use and working of switches

2.1.5. Routers – Use and working of Routers.

2.2 Network Operating Systems

2.2.1 Peer Network operating system (windows-XP) – Networking features of Window-XP.

2.2.2 Client-Server Operating System(Windows-NT and LINUX) – Their common network features.

2.2.3 Linux installation , creating users, groups and granting permissions.

3. Network Security Issues, concept and terminology

3.1 Definition of various types of security.

3.2 Security problems and possible problems (Theft, Unauthorized Disclosure,Information warfare, Accidental Data Loss)

3.3 Security issues with LINUX

4. Basics of TCP/IP

4.1 The TCP/IP protocol layer
4.2 IP addressing – IP Subnets – IP routing
4.3 Method of delivery – Unicast, Boradcast, Multicast and Anycast.
4.4 ICMP protocol , ARP protocol
4.5 Concepts of Port and Sockets.
4.6 User Datagram Protocol
4.7 TCP protocol

5. Email services and its basics
5.1 Architecture and Services
5.2 The User Agent
5.3 Message Formats , Message Transfer, Final Delivery Sytem
5.4 Simple mail transfer protocol (SMTP)
5.5 SMTP and Domain Name System
5.6 WWW
5.7 HTTP

6. Concepts of Cellular phones
6.1 working and signaling system
6.2 GSM and CDMA technology
6.3 3G and 4G technology of mobile
6.4 GPRS System and its working.

7. Bluetooth technology
7.1 Bluetooth Architecture
7.2 Bluetooth Application
7.3 The Bluetooth protocol stack
7.4 Bluetooth Frame structure

List of Reference Books:
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1) Networking Complete, BPB Publication
2) Mastering Local Area networks, Christa Anderson & Mark Minasi, BPB Publication
3) Computer Networks, Tenenbaum, PHI, New Delhi
4) **Next Generation Wireless Applications** by Paul Golding Wiley Publication
5) GPRS and 3G Wireless Applications (Professional Developer's Guide)by Christoffer Andersson **Publisher:** John Wiley & Sons
6) Introduction to CDMA Technology Author: Lawrence Harte Althos Publishing
7) IP Telephny Basics Author: Lawrence Harte, David Bowler, and Robert T. Flood Althos Publications
8) Introduction to WiMax Author: Lawrence Harte ISBN: 1-932813-74-3 Althos Publi.
9) Voice over Data Networks for Mangers Author: Lawrence Harte Althos Publi.
10) Bluetooth end to end by **by Diane McMichael Gilster Published by:** Wiley **ISBN:** 0764548875
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Paper : VIII (Computer Graphics)

1.Overview of Computer Graphics

- 1.1 Historical background of computer Graphics
- 1.2 Applications of Computer Graphics
  - 1.2.1 Entertainment
  - 1.2.2 Advertisement
  - 1.2.3 Simulation modeling
  - 1.2.4 Architecture.
  - 1.2.5 Virtual Reality
  - 1.2.6 Image processing
- 1.3 Popular graphics software
- 1.4 Pixel graphics versus Vector Graphics
- 1.5 Hard copy graphics Devices

2. Mathematical foundation for computer graphics

- 2.1 Basic geometry
  - 2.1.1 straight line and line segment
  - 2.1.2 Circle
  - 2.1.3 Elipse
  - 2.1.4 Conic sections
- 2.2 Three dimension geometry

2.3 Trigonometry

2.4 Matrix Algebra

2.4.1 Some special types of matrix

2.4.2 Matrix operations

3. Graphics primitive

3.1 Line Drawing Algorithms

3.1.1 Vecgen Algorithm

3.1.2 Brasenham Line Drawing Algorithm

3.2 Circle generating algorithms

3.2.1 Parametric circle drawing algorithm

3.2.2 Brasenham circle algorithm

3.3 Different line styles

3.3.1 Thick line

3.3.2 Line caps

3.3.3 Thick line joins

3.3.4 Pens and Brushes

3.4 Curves

3.4.1 DDA approach for drawing a circular arc

3.5 Text and Character Attributes

3.6 Anti Aliasing

4. Polygons

4.1 Polygon formation

4.2 Polygon inside tests

4.2.1 Even – odd method

4.2.2 Winding number method

4.2.3 Some other method for performing inside test

4.3 Polygon area filling

4.3.1 Flood fill method

4.3.2 Scan line fill method

4.3.3 Boundry fill

5. Geoetric Transformation

5.1 Basic transformation

5.1.1 Scalling

5.1.2 Translation

5.1.3 Rotation

5.2 Homogeneous Coordinates

5.3 Rotation relative to and Arbitary point

5.4 Some other transformations

5.4.1 Reflextion

5.4.2 Sharing

5.5 Coordinate Transformation

5.6 Inverse Transformation

5.7 Affine Transformation

5.8 Rastar Transformation

6. Viewing in two dimensions

6.1 Window and View port

6.2 Viewing Transformation

6.3 Clipping

6.3.1 Point Clipping

6.3.2 Line Clipping

6.3.3 Polygon Cliping

6.4 Sutherland – Hodgman Polygon clipping algorithm

6.5 Text Clipping

6.6 Multiple windowing

7. Color and Shading

7.1 Light Sources

7.2 Illumination

7.3 Shading

7.3.1 Constant Shading

7.3.2 Ground Shading

7.4 Transperancy

7.5 Shadow

7.6 Colors

7.6.1 RGB color model

7.6.2 CMY color model

7.6.3 HSB color model

7.7 Graphics File formats

7.7.1 Bitmap

7.7.2 JPEG

7.7.3 GIF

8. Graphics in 3-Dimension

8.1 3-D Transformation

8.2 Rotation of 3-Dimensional object

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

1. Concept of Java Programming
   - 1.1 Concept of Java virtual machine (JVM), Byte code
   - 1.2 Java compiler, Java interpreter
   - 1.3 One dimensional and multi dimensional arrays
   - 1.4 Using new and this key word, Garbage collection concepts
   - 1.5 Concept of Inheritance, Super keyword, method overriding
   - 1.6 Finalizer() method, Overloading methods, Overloading constructors
   - 1.7 Concepts of Static class, nested class, Inner classes and Abstract Class

2. Packages, Interfaces, Exception handling and multithreading
   - 2.1 Defining Package and concept of packages
   - 2.2 Defining interface and concept of interfaces
   - 2.3 Concept of Exception handling and use of try, catch, throw and finally
   - 2.4 Java Thread
   - 2.5 Thread priorities and Synchronization, Concept of multithreading

3. String Handling in Java
   - 3.1 String Constructors, Special string operation, Character extraction
   - 3.2 String Comparison, Searching a string, modifying string, Data conversion, Case Conversion, String buffer methods

4. Java.util package
   - 4.1 Date Class and its methods, Calendar class and its methods and currency class and its methods

5. JDBC – Java Database Connectivity
   - 5.1 The JDBC API, JDBC Derivers, JDBC-ODBC Bridge.
   - 5.2 Connectivity to Object Databases, Connectivity with Web-based database systems

6. Applet Class
   - 6.1 Applet concept, Architecture of Applet, Applet methods
   - 6.2 Graphic class, using status window

7. AWT class
   - 7.1 Layouts, Component class, Container class, Panel class, Window class, frame and canvas, Hiding and showing windows, Setting the windows direction, graphic class
   - 7.2 AWT controls, their constructors, properties and methods
   - 7.3 Menubar, MenuItem class and their methods, Dialog box

8. Event Handling Mechanism in Applet
   - 8.1 Event, Event Source and Event Listeners
   - 8.2 Key Event Class, Mouse Event Class, Mouse Wheel Event class, Text Event Class, Window Event Class

9. Advanced Java features
   - 9.1 Introduction to Java Swing, Benefits of Swing, Working with Swing – basic user interface components, Handling user events with Swings
   - 9.2 Web server – Tomcat Apache.
   - 9.3 JSP - Concept, application and implementation.
   - 9.4 Servlet - Concept, application and implementation.
   - 9.5 J2EE – Concept, application and implementation.

List of Reference Books:

1) The Complete Reference Java2, Herbert Schildt, TMH, New Delhi
2) Mastering JAVA2, John Zukowski, BPB
3) Teach Yourself Java2 platform in 21 days, Lamey & Cadenhead, Teach Media
4) Java in Nut shell, O'Relly Publication
5) Java Language Reference, O'Relly Publication
6) www.sun.com
7) www.tomcat.apache.org