

H. N. G. University , Patan
M.Sc.(CA & IT) – Semester - V
501: Networking – I

- Unit: 1** **[10%]**
Introduction: Uses of computer network, Network hardware – LAN, MAN, WAN. Network software – protocol hierarchies, Design issues for layers, Connection oriented and connectionless services, OSI model, TCP/IP model, and Comparison of OSI and TCP/IP model.
- Unit: 2** **[15%]**
Physical layer: Guided Media - Twisted Pair, coaxial cable, Fiber optics. Unguided transmission media - Radio wave, micro wave and infrared, Multiplexing – FDM, TDM, WDM. Switching – Circuit switching, Message Switching, Packet switching.
- Unit: 3** **[15%]**
The Data Link Layer: Design Issues - Framing, Error control, Flow control, Error detection and correction. Elementary data link protocols - Simplex, stop and wait, sliding window protocol - Go Back N, Selective repeat. Example of Data link protocol: HDLC.
- Unit: 4** **[15%]**
The Medium Access Control Sublayer: The channel allocation problem, Multiple Access protocols - ALOHA, CSMA protocols. Wireless LAN protocols – MACA, MACAW. Ethernet - Traditional Ethernet, Switched Ethernet, Fast Ethernet, Gigabit Ethernet. Data link layer switching - Transparent Bridges, source routing Bridge, Remote Bridges, Repeaters, Hub, Switches , Routers, Gateway.
- Unit: 5** **[25%]**
The Network Layer: Design Issues - Store and forward packet switching, Service provided to transport layer, Implementation of connection oriented and connection less service, Comparison of virtual circuit and datagram subnets, Routing algorithms - The Optimality principle, Shortest path routing, Flooding, Distance vector routing, Link state routing, Hierarchical routing, Broadcast routing, Multicast routing. Congestion control algorithms principles, Prevention policies, Congestion control in virtual circuit subnets, Congestion control in datagram subnets, Load shedding, Jitter control. Quality of service - Requirements, techniques for achieving good quality of service. The network layer in the internet - The IP protocol, IP addresses.
- Unit: 6** **[15%]**
The Transport Layer: The transport service - Services provided to the upper layers, Transport service primitives, Elements of transport protocol - addressing, Connection establishment, Connection release, Flow control, Multiplexing, Crash recovery.
- Unit: 7** **[05%]**
The Application layer: Electronic mail - overview. World Wide Web: Architectural overview, HTTP - overview.

Text Books :-

1. Computer network, Andrew S. Tanenbaum, fourth edition, Pearson.
2. Data communication and networking, Behrouz Forouzan, fourth edition, TMH.

Reference Book :-

1. Computer Network, Natalia Olifer, Victor Olifer, Wiley-India edition.
Data and computer communication, William Stallings, Pearson

H. N. G. University , Patan
M.Sc.(CA & IT) – Semester - V
502: Computer Based Optimization Models

Unit: 1

[25%]

Linear Programming Problems (LPP): Formulation of an LPP, Solution of an LPP using Graphic Method and Simplex Method, Slack, Surplus and Artificial Variables, Two-Phase and Big-M Method, Special cases in LPP: Alternate Optimum solution, An Unbounded Solution, Infeasible Solution, Duality in LPP, Integer Simplex Programming.

Unit: 2

[25%]

Transportation Problems: Definition, Methods for finding initial basic feasible solutions- North West Corner Rule, Least Cost Cell Entry Method, Vogel's Approximation Method, Methods for finding Optimal Solution – MODI Method,

Assignment Problems: Definition and concept, Solution of an Assignment Problem for optimum solution – Hungarian Method.

Sequencing: Job-Sequencing Problems for ... Processing N jobs on 2 Machines, Processing N jobs on 3 Machines, Processing N jobs on M Machines, Processing 2 jobs on M Machines (Graphic Method)

Unit: 3

[25%]

Inventory Models: What is Inventory?, Types of Inventories, Inventory Decisions, Costs involved in Inventory Problems, Controlled and Uncontrolled Variables, Deterministic Inventory Models (Only Static Demand Models), Selective Approaches to Different Inventory control Systems, Concept of an average Inventories, Concept of Economic Order Quantity (EOQ), (In short Model – I, II and Model III)

Replacement Models: Introduction - The Replacement Problem, Replacement of items that deteriorate (With Money Value), Replacement of Items that fail completely (Mortality Theorem)

Unit: 4

[25%]

Project Management By PERT and CPM: Introduction, Historical Development of CPM/PERT, Applications of PERT – CPM Techniques, Net – Work Diagram Representation, Rules for Drawing Network, Time estimation and Critical Path in Net-Work Analysis. Queuing theory: Introduction, queuing system, Queuing Problem, Transient and Steady states, traffic Intensity, distribution of queuing systems (Birth and Death Process), Queuing Models – I, II and III

Text Books :-

1. Operation Research By J. K. Sharma

Reference Book :-

1. Operation Research By R. Pannerselvam
2. Operation Research By S. D. Sharma

H. N. G. University , Patan
M.Sc.(CA & IT) – Semester - V
503: Advance Java Technology [J2EE]

- Unit: 1** [15%]
Introduction to J2EE Platform and Architecture
The J2EE Platform, The J2EE Architecture Containers, J2EE Technologies
Developing J2EE Applications, Introducing Java Mail and JMS
- Unit: 2** [10%]
Database Programming
ODBC and JDBC Drivers, Connecting to Database with the java.sql Package, Using JDBC
- Unit: 3** [25%]
Servlets
Introduction to Servlets and architecture , Servlet Life Cycle, Servlet based Applications,
type of servlet, Servlet and HTML, Session management
JSP
Introduction to JSP, JSP implicit objects, JSP based Applications, Session Management
- Unit: 4** [20%]
Remote Method Invocation (RMI)
The RMI Architecture, RMI Exceptions, Developing Applications With RMI, Parameter
Passing in RMI
XML
XML syntax and semantics, Document Type Definitions (DTDs),
XML based applications
- Unit: 5** [25%]
Java Beans
An overview of Java Beans, Requirement, Development and Scope of Java Beans, Design
consideration and Naming conventions of Java Beans and Guideline.
Enterprise Java Beans (EJB)
Introduction to EJB, Entity Beans, Session Beans
- Unit: 6** [05%]
Struts
What is Struts?, Development Models, Model-view-controller architecture,
Struts flow with an example application

Text Books :-

1. Professional Java Server Programming by Subrahmanyam Allamaraju

Reference Book :-

1. J2EE Bible by Justin Couch and Deniel H. Steinberg
2. Professional Java Server Programming Volume I and II, Wrox Publication.
3. J2EE Unleashed by Joseph J. Bambara, BPB publications
4. Enterprise JAVA J2EE 1.3 complete, BPB publications
5. The complete Reference Struts (seventh edition).

H. N. G. University , Patan
M.Sc.(CA & IT) – Semester - V
504: Computer Graphics

Unit: 1 **[25%]**
An Introduction Graphics System: Application of computer graphics, **Graphics Systems:** Video Display Devices – Refresh CRT, Raster and Random scan display, Color CRT, DVST, Flat panel Display. Raster Scan Systems, Random Scan Systems, Graphics Monitors and Work Stations, Input Devices, Hard Copy Devices, Graphics Software

Unit: 2 **[25%]**
Output Primitives: Points and Lines, Line Drawing Algorithms, Circle Generating Algorithms, Scan-Line Polygon Fill Algorithm, Inside-Outside tests, Boundary-Fill Algorithm, Flood Fill Algorithm, Character Generation.
Attributes of Output Primitives: Line attributes, Color and Grayscale Levels, Area fill Attributes, Character Attributes, Bundled Attributes. Antialiasing

Unit: 3 **[25%]**
Two-dimensional Geometric Transformations: Basic Transformations – translation, rotation, scaling. Matrix Representations and Homogeneous Coordinates, Composite Transformations – translation, rotation, scaling, general pivot-point rotation, general fixed-point scaling, scaling direction, concatenate properties. Other transformation - Reflection and Shearing.

Unit: 4 **[25%]**
Two-Dimension Viewing: The viewing Pipeline, Window to view port coordinate transformation, Clipping Operations, Point Clipping, Line Clipping – cohen-sutherland line clipping, Liang-barsky Line clipping, N-L-N line clipping, Polygon Clipping – sutherland-hodgeman polygon clipping, weiler-atherton polygon clipping, Text Clipping, Exterior Clipping.
Three-Dimensional Concepts: Three Dimensional Display Methods, 3D Transformations – translation, rotation, scaling. Parallel Projection and Perspective Projection.

Text Books :-

1. Computer Graphics 2nd edition By Donald Hearn and M.Pauline Baker pearson education

Reference Book :-

1. Computer Graphics: Principles and Practice J. Foley, A.van Dam, S. Feiner, and J. Hughes, 2nd edition pearson
2. Elements for Computer Graphics D. Rogers and J. Adams, Mathematical, McGraw-Hill International Edition.

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M.Sc.(CA & IT) – Semester - V
505: Advance Operating System

Unit: 1 **[25%]**

Introduction to Operating System Administration

What is system administration?
Preliminary Tasks Of System Administrator
Managing User Logins
Monitor System Activity And Security

Solaris Administration

Introduction To Solaris System Administration
User and Group Management

Unit: 2 **[25%]**

UNIX Designing

Introduction to the Kernel
The Structure of Processes
Process Control

Unit: 3 **[25%]**

UNIX Administration

Rootly Powers
Controlling Processes
Adding New Users
Periodic Processes
Backups
Using other archiving Programs
Network Management And Debugging
Security
Web Hosting And Internet Services
Policy And Politics
Daemons

Unit: 4 **[25%]**

Linux Administration

Rootly Powers
Controlling Processes
Adding New Users
Periodic Processes
Backups
Using other archiving Programs
Network Management And Debugging
Security
Web Hosting And Internet Services
Policy And Politics
Daemons

Text Books :-

1. The Design Of Unix Operating System
By: Batch Publication: Pearson Education Asia
2. Unix System Administration Hand Book
By: Evi Nemeth, Garth Snyder, Scott Seebass, Trent R. Hein
Publication: Low Price Edition (Pearson Education Asia)
3. Linux System Administration Hand Book
By: Evi Nemeth, Garth Snyder, Scott Seebass, Trent R. Hein
Edition: Low Price Edition (Pearson Education Asia)
4. The Complete Reference Solaris 9
By: Paul Watters
Publication: TATA McGraw-Hill