FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABUS

FOR

M.Sc. (Network & Protocol Design)
(Two Years Course)

(SEMESTER: I – IV)

Session: 2019-20

GURU NANAK DEV UNIVERSITY
AMRITSAR

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER SYSTEM)

Eligibility:

Graduate with Computer Science/IT/ Computer Applications / Computer Maintenance as one of the elective subjects with 50% marks in aggregate.
OR
BCA/B.Sc. (IT)/ BIT of GNDU or equivalent there to with atleast 50% marks in aggregate.
OR
Graduate with mathematics as an elective subject and Post-Graduate Diploma in Computer Applications / PG Diploma in Information Tech. / PG Diploma in E-Commerce & Internet Application or equivalent with 50% marks in the aggregate.

Scheme

SEMESTER–I:

Paper	Subject	Marks
MSNP-101	Advanced Networks Communication Concepts and Techniques	100
MSNP –102	Concept of Core and Advanced Java	100
MSNP -103	Advanced Mobile Communications	100
MSNP -104	Network Programming Concepts: Sockets, TCP and UDP Communication	100
MSNP -105	Network Operating System	100
MSNP -106P	Programming Lab	100
	Total Marks:	**600**

SEMESTER–II:

Paper	Subject	Marks
MSNP-201	Network Programming-I Sockets API in C and LINUX	100
MSNP - 202	Design & Implementation of Client-Server Architecture	100
MSNP -203	Protocol Designing	100
MSNP -204	Recent Routing Techniques	100
MSNP -205	Advanced Network Design and Security Concepts	100
MSNP -206P	Network Programming Lab	100
	Total Marks:	**600**

M.Sc. (NETWORK & PROTOCOL DESIGN)
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SEMESTER–III:

Paper	Subject	Marks
MSNP-301	Linux Administration	100
MSNP-302	Network Design and Performance Analysis	100
MSNP-303	ASP.NET	100
MSNP-304	Exchange Server	100
MSNP-305	Network Security	100
MSNP-306	Programming Lab	100
	Total Marks:	**600**

SEMESTER–IV:

Paper	Subject		Marks
MSNP-401	Industrial Training	(Ext. 400 + Int. 200)	600

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-I)

MSNP-101: Advanced Networks Communication Concepts and Techniques

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A
Data Communication networks & Open System Standards: Data Communication Networks, Protocols & Standards, Open Systems, ISO Reference Model, Switching & Switching Elements.

Multiplexing:- FDM,STDM; i.e Synchronous & Statistical Time Division Multiplexing. ATM Protocol Architecture ,ATM Logical Connection ,ATM Cells , Transmission of ATM Cells, ATM Service categories, ATM adaptation Layer.
Section–B
Data Transmission: Data Transmission basics, Asynchronous Transmission, Synchronous Transmission, Error Detection & Control, Data Link Control Protocols.
Section–C
Local Area Networks & Wide Area Networks: Wired LANs, Wireless LANs & Protocols, Performance, High Speed LANs: FDDI, Fast Ethernet, Packet Switched & Circuit Switched Networks, X.25 Networks, ISDN.
Section–D
Internetworking and Firewalls: Introduction, Subnet & Subnet Architecture, Internetworking Architectures & Issues, Internet Protocol Standards, IPv4, IPng, ICMPv4, ICMPv6, Routing Protocols, Firewalls Basics.
Application Layer Protocols: Basics, Commands: TCP, UDP, FTP, TFTP, TELNET, Ping, Trace route, SMTP, POP3, SNMP, Time Protocol, NNTP.

References:
1. Data Communications & Networking, Forouzan, Tata McGraw 2nd Edition 2006
2. Data Communications, Computer & Computer Networks & Open Systems, Fred
   Halsall, Pearson Education 2006 edition.

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-I)

MSNP-102
Concept of Core and Advanced Java

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
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The student can use only Non-programmable & Non-storage type calculator.

Section–A
Java Fundamentals: Features, Object Oriented Basics, Java Virtual Machine

Character set, Operators, Data Types, Control Structures

Section–B
Classes, Inheritance, Polymorphism, Packages & Interfaces, Stream IO Classes

Exception Handling, Multithreading, Applet Package

Section–C
Applet Programming

Distributed Programming in Java using RMI, COBRA Technologies

Section–D
Network Programming in Java using Sockets API

Protocol Design: Telnet, FTP, Web Server

References:

1. Complete Reference: Java, Herbet Schildt & Naughton, Tata Mc Graw 5th Edition 2006.
2. Java Unleashed, Jame Jawoske, SAM5, Tech Media 2006.

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-I)

MSNP 103
Advanced Mobile Communications

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A
Introduction: Introduction to wireless & mobile communication, wireless transmission, multiplexing, modulations, spread spectrum, cellular systems.
Telecommunication systems: GSM, DECT, TETRA, UMTS & IMT-2000

Section–B
Satellite Systems: Basics, routing, localization, handover
Broadcast System: Cyclical repetition of data, digital audio and video broadcasting, Convergence of broadcasting and mobile communication.

Section–C
Wireless LAN: Comparison of infrared and radio transmission, infrastructure and adhoc networks, IEEE 802.11, HIPERLAN, Bluetooth
Mobile Network Layer: Mobile IP, DHCP, mobile adhoc networks.

Section–D
Mobile Transport Layer: Traditional TCP, TCP improvements, TCP over 2.5/3G wireless networks
Support for Mobility: World wide web, wireless application protocol (version 1.x), wireless telephony application, push architecture, push/pull services, WAP 2.0
Architecture of Future Networks

Reference:
1: Mobile Communications -Jochen Schiller Pearson Education, 2nd edition, 2003

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-I)

MSNP-104
Network Programming Concepts: Sockets, TCP and UDP Communication

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A
Sockets and Socket Address structures, Concept of Zombies, Daemon Processes, Super servers, Concurrent versus Iterative servers, Protocol Independence, Error Handling: Wrapper functions, OSI Model, Unix standards
Section–B
TCP Connection Establishment & Termination, Port Numbers and Concurrent Servers, Protocol Usage by common Internet Applications

UDP Communication Semantics, UDP Echo Server, Echo Client working, Protocol Usage by Common Internet Applications
Section–C
Sockets Address Structures, Byte ordering & Manipulation Functions, TCP Socket System Calls, TCP Client- Server E.g., I/O Multiplexing, Signal Handling in Concurrent Servers

Elementary TCP sockets: socket function, canned function, blind function, listen function, accept function, conclusion server, close function
Section–D
I/O multiplexing: select & Pol functions, I/O model, batch input TCP echo server.

Socket Options, Elementary Names Address Conversions, IPv4 and IPv6 Interoperability

References:
1. Advanced Programming in UNIX Environment, W Richard Stevens, Pearson Education 4th edition 2006.
2. Network Programming, W Richard Stevens, Pearson Education, 3rd edition 2003.
Note: students should be taught these concepts on ANSI C & POSIX Standards

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MSNP-105
Network Operating System

Time: 3 Hours   **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A
Introduction of various Network Operating Systems: Windows 2000/2003/XP, Unix/Linux.
Overview of Network Operating System: Introduction, Architecture, Shell, Kernel, File System, Hardware requirements, Active Directory, Clustering & Load Balancing, Storage Management, Editors, Networking and Communication features, Licensing

Section–B
Disk Management: Terminology and Concepts, Managing Disks, Managing Basic and Dynamic Disks, Disk Quotas, Disk Fragmentation, Remote Storage, RAID and Mirroring.
Servers: Managing DHCP, IIS, WINS, DNS and Proxy servers.

Section–C
User, Group and Computer Accounts: Creating and Managing user, Group and Computer Accounts, Managing Access Controls, Troubleshooting Accounts.

Performance Monitoring and Security: Task Management, System Monitoring, Performance Logs and Alerts, Monitoring Memory, Network and Process Objects, Auditing Security Events, Audit Policy and Event Viewer.
Section-D
Special Topics: Introduction to E-Mail, Telnet and FTP, Distributed Systems.
Case and Comparative Studies: Windows 2003 server and Unix/Linux.

Reference:
1. MSNPA / MSNPE; Exam 70-291, Implementing, Managing and Maintaining a Windows Server 2003.
2. Network Infrastructure by Shinder Deborah Littlejohn, Shroff Publishers, 7th Reprint, 2005.
3. Networking: The Complete Reference by Craig Zacker, Tata McGraw Hill, Seventh Reprint, 2004.
4. Unix Concepts and Applications, Sumitabha Das,Third Edition, Tata McGraw Hill, First Reprint, 2003.
5. Unix and Shell Programming : A Text Book, Behrouz A. Forouzen, Second Reprint., 2005.
6. Linux: A practical Approach, B. Mohamad Ibrahim, Second Reprint, 2006.
7. Linux Security, Hontanon Ramon J., 2001.
8. The Internet: Douglas E. Comer, 3rd Edition, 2003.

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-I)

MSNP-106P
Programming Lab

Time: 3 Hours   **Marks: 100**

Programming Lab based on Advanced Java and Network Operating System.

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-II)

MSNP-201
Network Programming-I Sockets API in C and LINUX

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A

Advanced sockets, Advanced Names & Address conversions, Daemon Processes and their Implementation, Advanced I/O Functions: *recv & send, readv & writev, recvmsg & sendmsg*

Section–B

UNIX Domain Protocols, UNIX domain Socket address structure, Socket Functions, Stream & Data gram Client-Server.
Section–C

Nonblocking I/O, Routing sockets, Broadcasting & Multicasting, Advanced UDP Sockets, Raw Sockets
Section–D

Threads, Multithreading, POSIX Standards for Thread Implementation, Mutual Exclusion, Pipes, Web server and Web Client Implementation

References:
1. Advanced Programming in UNIX Environment, W Richard Stevens, Pearson Education, 2nd Edition, 2006.
2. Network Programming, W Richard Stevens, Pearson Education, 2nd Edition 2003

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-II)

MSNP-202
Design & Implementation of Client-Server Architecture

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A
Client-Server Need, Benefits, Migration from Centralized to Decentralized Heterogeneous Computing, Client-Server Computing midway in Distributed and Heterogeneous Computing Communication techniques in Client-Server

Section–B

Memory Management and Protection for Network Operating system, Distributed File System Client-server Process based vs Thread based, Multithreading

Section–C

Scheduling Implementation, Schedule internal, Preemptive vs Non Preemptive System. Synchronous Under Lindy & Using Semaphore, semaphore implementation Using semaphore for Mutual Exclusion, Event Synchronous.

Section–D

Client-Server Architecture Design: Independence at OS, File System Level, IPC Layer
Formulation: Predefined vs Flexible, Application Layer
Section–D
Middleware: MOM, CORBA, COM, DCOM
RPC: Synchronous and Asynchronous

References:
1. Novell's Guide to Client-Server Design and Implementation, Jeffery D Schank BPB Publication 1st Reprint Edition 2002.
2. Client-Server Unleashed, Neil Jenkins, SAM5, 2006 Edition.

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(SEMESTER-II)

MSNP-203
Protocol Designing

Time: 3 Hours   **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A

How to Specify Network Protocols: Syntax and semantics of Traditional protocol specifications, new protocol specifications
First protocol Examples: Vending machine, Request/Reply, Manchester Encoding

Section–B

Network Processes: Constants, inputs and variables, actions, protocol execution
More on Processes: Messages with fields, Nondeterministic assignment, Process arrays, parameters, Resource allocation protocol

Section–C

Transmission errors
Maintaining local, global, hierarchical topology information
The abstraction of perfect channel, Application structures

Section–D

Security: Asymmetric & symmelue keys, authentication used system key, auth. Using asy. Keys, privacy & integrts, non repudiate, merge layer.
Data Compression: Huffman coding, static Huffman compression, dynamic Huffman compression, context sensitive compression, lossy compression
Applications, Protocol layers and hierarchies

Reference:
Elements of network Protocol Design: Mohamed G. Gouda (Wiley Publications), 2006.

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-II)

MSNP-204
Recent Routing Techniques

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A
Hubs, switches, faster LANs, virtual LANs
Distance vector routing, link state routing, load splitting, link cost, migrating routing algorithms
Intradomain routing protocols, RIP, RTMP, IPX – RIP, DECnet, IS-IS, OSPF, NLSP and PNNI.
Section–B
Interdomain switches, bridges vs routers, extensions to Bridges, extensions to routers.
Routers and LANs, Routers and WANs, Mechanics of routing Protocols, Internetworking with dissimilar protocols, future of routing.
Section–C
Protocol Designing: Simplicity vs flexibility vs optimality, overhead & scaling, operation above capacity, forward compatibility, migration: routing algorithms & addressing parameters.
Section–D
Protocol Designing: Making multiprotocol operations possible, robustness, determinism vs stability, performance for correctness.

Reference:
1. Interconnections: Bridges, routers switches & Internet-working protocols
   Radia Perlman (Pearson Education)
2. IP Routing Fundamentals, Mark Sportack (Pearson Education)

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-II)

MSNP-205
Advanced Network Design and Security Concepts

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

The student can use only Non-programmable & Non-storage type calculator.

Section–A

Basics: Introduction, Protocol Structure
Specification and Modeling: Validation Models, Correctness Requirements, Protocol Design, Finite State Machines
Section–B

Conformance Testing, Synthesis and Validation: Conformance Testing, Protocol Synthesis, Protocol Validation
Section–C

Design Tools: A protocol Simulator, A Protocol Validator, Using the Validator

Section–D

Network Security: Features, Security in Wireless, adhoc and sensor networks

Reference:
Design and validation of computer protocols: Gerard J. Holzmann   (Prentice Hall)

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(SEMESTER-II)

MSNP 206P
Network Programming Lab

Time: 3 Hours   **Marks: 100**

Network Programming Lab based on socket API in C and LINUX / SOLARIS

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-III)

MSNP-301
Linux Administration

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.
Section A
Introduction: Introduction to LINUX, Installing LINUX, Partitions, LILO, Installing software packages. Updating with Gnome, Updating with KDE, Command line installing.

File Structure: LINUX files, File structure, File & Directory permission, Operations on a file.
Sectione B
Administering Linux: Creating a user A/C, modifying a user A/C, Deleting a user A/C, Checking Disk Quotas, System Initialization, System start-up & shutdown, Installing & managing H/W devices.

Setting Up A LAN: Understanding LAN, Setting up Wireless LAN, Understanding IP address, Troubleshooting LAN.
Section C
Setting Up Print Server: Choosing CUPS, Working with CUPS Pointing, Managing Pointing, Configuring Point Server.

Setting Up File Server: Setting up an NFS, SAMBA, Installing & Running send mail.
Section D
Setting Up Web Server: Configuring the Apache Server, Starting & stopping the server, Monitoring Server Activities.

Setting Up DHCP & NIS: Setting up DHCP Server, Setting up DHCP Client, Setting up Network Information Service.

Troubleshooting: Troubleshooting LINUX in GRUB mode.

References:
1. Redhat Linux(10) Bible :   Christopher Negus, 2003
2. Linux Unleashed :   Tim Parker, 2006
3. Linux Administration Tools :   Charles Fisher, 2007

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-III)

MSNP-302
Network Design & Performance Analysis

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section A
Requirements, Planning & Choosing Technology: System requirements, Traffic sizing characteristics time & delay consideration .

Traffic Engineering and Capacity Planning: Throughput calculation traffic characteristics & source models, Traditional traffic engineering, Queued data & packet switched traffic modeling, Designing for peaks, Delay or latency

Section B
Network Performance Modeling : Creating traffic matrix, Design tools, Components of design tools, Types of design projects.

Technology Comparisons: Generic packet switching networks characteristics, Private vs. public networking, Business aspects of packet, Frame and cell switching services, High speed LAN protocols comparison, Application performance needs, Throughpat, burstiness, Response time and delay tolerance, Selecting service provider, Vendor, service levels etc.

Section C
Access Network Design: N/W design layers, Access N/W design, Access N/W capacity, Backbone N/W design, Backbone segments, Backbone capacity, topologies, Turning the network, Securing the network, Design for network security.

Documentation and Network Management: Documentation, Network management, SNMP, RMON.

Section D
Network Optimization: Network optimization theory, Goals of network optimization, measurements for network optimization, Optimization tools, Optimization techniques.

Reference :

Data Network Design: Darren Spohn, Tata Mc Graw Hill, 2006

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-III)

MSNP-303
ASP.NET

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.
Section A
Using The Standard Controls: Display information, Accepting user input, Submitting form data, Displaying images, Using the panel control, Using the hyperlink control.

Using The Validation Controls: Using the required field validator control, Using the range validator controlusing the compare validator control, Using the regular expression validator control, Using the custom validator control, Using the validation summary controls.

Using The Rich Controls: Accepting file uploads, Displaying a calendar, Displaying advertisement, Displaying different page views, Displaying a wizard.
Section B
Designing Website With Master Pages: Creating master pages, Modifying master page content, Loading master page dynamically.

Overview Of Data Access: Using data bound controls, Using data source controls.

Using The SQL Data Source Control: Creating database connections, Executing databasecommands, Using ASP.net parameters with the SQL data source controls, Programmatically executing SQL data source commands, Cashing database data with the SQL data Source controls.
Section C
Using List Controls : Overview of the list controls, Working with the dropdown list control, Working with the radio button list controls, Working with the list box controls, Working with the bulleted list controls, Creating a custom list controls.

Using The Grid View Controls: Grid view control fundamentals, Using field with the gridview control, Working with grid view control events extending the grid view control.

Building Data Access Components With ADO.NET: Connected the data access, Disconnected data access, Executing a synchronous database commands, Building data base objects with the .NET framework.
Section D
Maintaining Application State: Using browser cookies, Using session state, Using profiles.

Cashing Application Pages And Data: Overview of cashing, Using page output cashing, Using partial page cashing, Using data source cashing, Using data cashing, Using SQL cache dependences.

Reference:

ASP.NET 3.5: Stephen Walther, Pearson Education, 2005

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-III)

MSNP-304
Exchange Server

Time: 3 Hours   **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section A
Microsoft exchange server 2003 and active directory: Active directory – Introduction, Integration of window server 2003 and exchange server 2003 protocol and services
Preparing a Microsoft exchange server 2003 environment: Installation requirements, preparing forests and domains
Section B
Installing and upgrading to exchange server 2003: Installing exchange server 2003, performing an unattended setup for exchange server 2003 , removing Exchange Server 2003 Server from an organization, Installing Exchange Server 2003 in a Clustered Environment, Installing and using Management Tools and Utilities, Upgrading from Exchange 2000 Server Exchange 2003
Managing Exchange Server 2003: Configuring Exchange Server through Exchange Policies, Configuring Exchange Server 2003 for Management, Adding Exchange Server, Exchange Server 2003.
Configuring a secure Exchange Server 2003 Environment: Securing Mail Boxes, Implementing Digital Signature and encryption capabilities, configuring fire walls, configuring Administrative permission, allowing only required services to run on Exchange 2003.
Section C
Managing Exchange Recipients: Introduction to exchange Recipients, Creating deleting and modifying user and contacts, Managing Mail boxes, Managing Mail-Enabled Groups.
Managing Public Folders: Managing Public folder data, Managing access to Public folder, Publishing an Outlook 2003 form
Creating and Managing address List: Introduction to address List, Managing and Customize addresses Lists
Implementing Client Access with Internet Protocol: Introduction to client access protocol implementing a front-end and back-end server topology, implementing and managing outlook web access
Managing Client Configuration and connectivity: Configuring and customize outlook 2003, Calendaring Tasks in Outlook 2003, Installing and configuring outlook express

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(SEMESTER-III)

Section D

Implementing and managing Routing: How Message Routing work in Exchange Organization configuring Routing in an exchange Organization, Explaining Internet connectivity concepts Protocols, Managing Connectivity to the internet.

Managing Mobile Devices with Exchange Server 2003: Managing Mobile Services Components, Enableling user Accounts for Mobile Access

Managing data storage and hardware resource: Managing data storage, Managing disc space, managing hardware upgrades

Managing Disaster Recovery in Exchange server 2003: Managing data storage, Back up Exchange server 2003, Restoring Exchange server 2003.

Monitoring Microsoft Exchange 2003: Performing daily Exchange 2003 maintenance, Performing on demand exchange on demand exchange maintenance.

Migrating users from Exchange server 5.5 to Exchange server 2003: Populating active directory with windows NT user and group accounts, Connecting the exchange directory to active directory

Reference:

Exchange Server: Walter Glenn, PHI Publication, 2006

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-III)

MSNP-305
Network Security

Time: 3 Hours **Marks: 100**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section A
Essentials of Network Perimeter Security: Terms, Defense in depth.

Packet Filtering: TCP/IP Primer, How Packet Filtering Works, TCP and UDP Ports, TCP's Tree-way Handshake, The Cisco Router as a Packet Filter, An Alternative Packet Filter : IP Chains, The Cisco ACL, Effective Uses of Packet-Filtering Devices, Tracking Rejected Traffic, Problems with Packet Filters, Dynamic Packet Filtering and the Reflexive.
Section B
Stateful Firewalls: How a Stateful Firewall Works, The Concept of State, Stateful Filtering and Stateful Inspection.

Proxy Firewalls: Fundamentals of Proxying, Pros and Cons of Proxy Firewalls, Types of Proxies, Tools for Proxying.
Section C
Security Policy: Firewalls Are Policy, How to Develop Policy, Perimeter Consideration.

Network Intrusion Detection: Network Intrusion Detection Basics, The Roles of Network IDS in a Perimeter Defense, IDS Sensor Placement, Using an IDS Management Network.

Host Hardening : The Need for Host Hardening, Removing or Disabling of Unnecessary Programs, Limiting Access to Data and Configuration Files, Controlling User and Privileges, Maintaining Host Security Logs, Applying Patches, Additional Hardening Guidelines.

Host Defense Components: Hosts and the Perimeter, Antivirus Software, Host-Based Firewalls, Host-Based Instruction Detection, Challenges of Host Defense Components.

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(SEMESTER-III)

Section D

Instruction Prevention Systems: What is IPS, IPS Limitation. NIPS, Host-Based Intrusion Prevention Systems, Monitoring File Integrity, Monitoring Application Behavior.

Fundamentals of Secure Perimeter Design: Gathering Design Requirements, Design Elements for Perimeter Security.

Separation Resources: Security Zones, Common Design Elements, VLAN-Based Separation.

Wireless Network Security: Fundamentals, Securing Wireless Networks, Auditing Wireless Security.

Reference:
Inside Network Perimeter Security   Stephen Northcutt
                                           Lenny Zeltser
                                           Scott Winters, Pearson Education, 2007

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-III)

MSNP-306
Programming Lab

Time: 3 Hours   **Marks: 100**

Programming Lab based on Linux Administration and ASP.NET

M.Sc. (NETWORK & PROTOCOL DESIGN)
(SEMESTER-IV)

MSNP-401: Industrial Training

Max. Marks: 600
Ext.: 400
Int.: 200

Ist Synopsis (Containing mainly literature survey corresponding to the problem taken up for the project work and line of attack to solve the problem) within one month of joining the training will be evaluated for marks: 100

IInd Synopsis (containing essentially the progress of work in comparative details) with in three month of joining the training will be evaluated for marks: 100

Final Project Report for Marks : 200

Seminar/Viva Voce by the Student for Marks : 200

Synopsis Ist & IInd will be evaluated by Head of Department of the college and internal examiner.

1. Candidates have to submit only one hard copy and CD of documentation which shall be kept with the course supervisor/guide in the college only. Further, supervisor/guide OR principal of college shall forward two copies of DVD (Digital Versatile Disk) containing all the documentation files of the students (file name to be saved as Rollno_of_the_ student .pdf) to the concerned branch of the University. Covering letter (duly signed by the principal/Head of the college/institute) should contain the following information. *Candidate name, Candidate Roll no, Project Title of the student and .pdf file name of his project documentation.*

2. *The assignment shall be evaluated by a board of three examiner (two (02) External examiners and one (01) internal examiner) as approved by the BOS.*

3. The Project is to be submitted as per the common ordinances for P.G. courses under semester system.